Linking care bands to resource allocation for home support and long-term residential care: an evidence review

July 2021

Authors:

Joan Quigley

Tonya Moloney

Kathryn Lambe

Caitriona Lee

Disclaimer

Any views expressed in this report are those of the authors and not necessarily those of the Minister for Health, the Department of Health, or the Health Research Board.

Published by:

Health Research Board, Dublin

t 353 1 234 5000
f 353 1 661 2335
e hrb@hrb.ie
w www.hrb.ie

Table of Contents

List of Tables

List of Figures

Acknowledgments

We extend our thanks to our colleagues in the Department of Health and the peer reviewers for their valuable contributions to this report: Professor Kathy Eagar, Professor Matthew Parsons, and Dr Jason M. Sutherland.

Abbreviations

Abbreviation	Explanation
ACFI	Aged Care Funding Instrument
ACHA	Assistance with Care and Housing for the Aged
ADLs	activities of daily living
AHSRI	Australian Health Services Research Institute
AN-ACC	Australian National Aged Care Classification
CMI	case mix index
DOH	Department of Health
GAO	General Accounting Office
GP	general practitioner
HACC	Home and Community Care
HRB	Health Research Board
IADL	instrumental activities of daily living
interRAI	International Resident Assessment Instrument
interRAI LTCF	interRAI Long-Term Care Facilities Assessment System
interRAI-CA	interRAI Contact Assessment
interRAI-HC	interRAI Home Care Assessment System
interRAI-MDS 2.0	interRAI Minimum Data Set 2.0
LTCH	long-term care hospital
MedPAC	Medicare Payment Advisory Commission
MeSH	Medical Subject Heading
MS-LTC-DRG	Medicare Severity-Long Term Care-Diagnosis Related Groups
NRCP	National Respite for Carers Program
NSAF	National Screening and Assessment Form
OT	Occupational therapy
PDGM	Patient-Driven Groupings Model
PPS	prospective payment system
PRISMA	Program of Research to Integrate the Services for the Maintenance of Autonomy
PT	Physical therapy
RAI-MDS 2.0	Resident Assessment Instrument Minimum Dataset 2.0 [Alberta]
RUG	Resource Utilization Groups
RUG-III	third version of the Resource Utilization Groups
RUG-III-HC	Resource Utilization Groups III Home Care
RUG-IV	Resource Utilization Groups IV
SNF	skilled nursing facility

Abbreviation	Explanation
TLA	territorial local authority
USA	United States of America

Executive summary

Purpose

In order to enable people to continue to live at home for as long as possible, the Irish Government is committed to establishing a new statutory scheme for the financing and regulation of home-support services.[1] it is envisaged that a key component of the statutory scheme will be the design of a case mix classification and resource allocation model for home support that dovetails with the model underpinning the provision of nursing home care as service users move through the continuum of care. Under case mix classification models, or what we will refer to as 'care-banding' systems, service users are allocated to subgroups according to their expected resource use. When case mix classification is used for payment purposes, resources are allocated on the basis of these homogenous subgroups, rather than a fee-for-service (i.e. fee per hour of care) basis. The goal of case-mix models is to enable equitable distribution of resources across client groups.

In response to recent independent reviews of the Nursing Home Support Scheme, the Department is committed to introducing a needs-based or care-banding approach to resource and payment allocation in the long-term residential care sector. Accordingly, there is a particular interest in how resource allocation models using resource utilization groups have been developed internationally. The operational effectiveness of such systems is also of interest. This evidence review will enhance the evidence base for the design of a bespoke case mix classification/resource allocation model for Ireland's statutory home support scheme and residential care services.

Research questions

The following questions were agreed with the Department of Health:

1. Describe the use of care bands to classify care needs in six case countries.
    a) Are care bands used to classify the assessed care needs of prospective users of home support services or residential care, or both?
    b) What care bands are used? (To include definitions, number of bands, and who classifies the care bands.)
    c) How is mobility between care bands enabled, ensuring responsiveness to service users' changing care needs (e.g. moving to more or less intensive care)?
    d) How are decisions on the care banding of service users reviewed, and what mechanisms are in place to enable service users to appeal decisions made in relation to their care band allocation?
2. Describe the linking of care bands to service or resource allocation.
    a) How are care bands used? Are they confined to classifying people's levels of care need, or do they define the type/quantum of services/care for which people are eligible or the funding available (i.e. to what extent are care bands utilised to underpin resource allocation)?
    b) Where care bands are linked to resources, how is the amount/value of the resource determined?
    c) Where care bands are linked to resources, what funding models/mechanisms are utilised to underpin the resource allocation provided?
3. What is the service user, health system, and Exchequer experience of resource allocation through care bands?
    a) Is there evidence to demonstrate that resource allocation through care bands:
        - Provides better outcomes for service users
        - At system level, supports equity of access to services across the continuum of care

- Delivers care at the lowest level of complexity, i.e. in the community, whenever possible, and
- Provides value for money for the Exchequer?

b) How were the evaluations carried out? What were the main evaluation findings and what changes have been made in response to these?

Methods

Six countries (Australia, Canada, Germany, the Netherlands, New Zealand, and the United States of America (USA)) were chosen for this review based on their use of standardised case mix models in both the home care setting and in long-term residential care facilities, and to ensure adequate coverage of systems in Europe.

Questions 1 and 2 relating to model description were answered using country case study methodology. Question 3 was addressed using standard systematic review methods.

Eligibility criteria were set jointly for Questions 1 and 2, with additional criteria for Question 3. Systematic searching of six databases was carried out between August and November 2020. This was supplemented by a grey literature search and citation chaining/reference chasing. Search terms were derived on the basis of scoping searches. Abstracts and full papers identified by the search were screened independently for eligibility by two researchers.

For Questions 1 and 2, a descriptive synthesis of the case mix classification/resource allocation model for each country was developed following the questions and sub-questions outlined above.

For Question 3, data for each included study were extracted by a single reviewer into a bespoke extraction sheet in Microsoft Excel. Critical appraisal was carried out for each study using the Effective Public Healthcare Panacea Project's Quality Assessment Tool for Quantitative Studies. Extracted data and critical appraisal were verified independently by a second reviewer against a clean copy of the publication. Following extraction, narrative synthesis was carried out for each of the outcomes specified by the question (service user outcomes, equity, delivery at the lowest level of complexity, costs, and response to evaluation). Quantitative synthesis (e.g. meta-analysis) was not deemed to be feasible.

Findings

Questions 1 and 2: Model description: Country case studies

Australia

Care bands are used and linked to resource allocation in both home support and residential settings in Australia. In home support, assessment is carried out by Aged Care Assessment Teams using the National Screening and Assessment Form. Needs are assessed across five domains: social, physical, medical, psychological, and complexity/vulnerability. On this basis, service users are assigned to entry-level support (the Commonwealth Home Support Programme) or a home support package at one of four levels, according to the frequency, intensity, and complexity of services required. A maximum government subsidy is attached to each level of Home Care Package, specified as a flat daily rate with supplements for those in particular groups, those experiencing hardship, and/or depending on the location of the service user. Subsidies are income-tested. In residential care, the Aged Care Funding Instrument is used to define the care needs of residents at four levels in each of three domains: activities of daily living (ADLs), behaviour, and complex healthcare. Care needs for each domain are designated at one of four levels: nil, low, medium, or high. A basic daily subsidy rate is specified for each of these 12 categories, which is additive based on the amount awarded for each of the three domains. Supplements for particular groups are also specified, as well as subsidies for viability based on the location of the service user. Subsidies are income-tested, and service users may be required to pay a contribution.

The Australian National Aged Care Classification is a proposed new funding model for residential aged care, developed by the Australian Health Services Research Institute. This model categorises residential care service users into 13 classes based on care needs, upon which government subsidies for residential aged care providers are partially based. A trial of the Australian National Aged Care Classification assessment framework was completed in March 2020.

Alberta, Canada

Healthcare in Canada is the responsibility of the provincial/territorial governments; therefore, we have provided full information for only one province (Alberta, which has a long history of using case mix classification) and summary information for all the other provinces and territories. In Alberta, care bands are used to produce system-level case mix analyses of home support service provision; however, they are not linked to resource allocation.

Care needs of older and younger adults are assessed by a case manager using the International Resident Assessment Instrument Home Care Assessment System (interRAI-HC). Data from this assessment are submitted to the Home Care Reporting System, and on this basis, the Canadian Institute for Health Information produces system-level case mix analyses of home support service provision using the Resource Utilization Groups III Home Care (RUG-III-HC) tool. The RUG-III-HC classifies assessments into one of seven clinical categories: special rehabilitation, extensive services, special care, clinically complex, impaired cognition, behaviour problems, and reduced physical functions. Each of the categories contains between two and five further subdivisions, or groups, for a total of 23 groups. Care bands are used and are linked to resource allocation for residential settings only. Patient/Care-Based Funding (PCBF) was introduced for residential care in 2010 to allocate equitable funding to providers based on the relative needs of residents. Resident assessment is carried out using the interRAI Minimum Data Set 2.0. On this basis, the third version of the Resource Utilization Groups (RUG-III) system is used to classify residents according to their care needs, and a case mix index for the provider is calculated based on the RUG-III classifications of all the residents in their care. The RUG-III is structured similarly to the RUG-III-HC, with the same 7 clinical categories, each with between 3 and 14 subdivisions, or groups, for a total of 44 groups. Each group has an associated case mix index, and funding amounts for staffing, equipment, and supplies are calculated on the basis of the provider's aggregated case mix index. Accommodation costs and capital expenditure are funded separately.

Germany

A shared system of care bands is used and linked to resource allocation in both home support and residential care settings in Germany. Care bands are graded on levels of physical, mental, and psychological ability and dependence, from Care Level 1 (the lowest level of care with minimal impairment) to Care Level 5 (the highest level of care). Care Level 1 is designed for individuals who do not yet need significant care, and gives a limited level of funding towards services and/or goods that will allow the individual to remain in their own home in good health. Care Levels 2–5 are intended to assist with more intense care needs and are available to both residential and home-based applicants. Each care band is linked to allowances for several types of care, from a general care allowance to preventive care, inpatient care, day care, and night care. Each band is also allowed a different amount for support/relief care, and for products needed for care. A co-payment may be payable where the grants do not cover the full cost of residential care, and this can differ between residential establishments.

Netherlands

At present, there are a number of classification systems in use in Dutch home care (e.g. NANDA-I, Omaha, or the International Resident Assessment Instrument (interRAI)). The development of a case mix classification system for home support is currently being explored, with a view to introducing a prospective payments system for people who need less than 24-hour supervision due to old age, illness or disability. A shared care band system is used for service users requiring long-term care, i.e. residential care or intensive 24-hour home support. A system of care profiles is used, and these profiles are divided into eight sectors. There are six care profiles within the nursing and care sector:

sheltered living with intensive supervision and extensive care; protected living with intensive dementia care; protected living with intensive care and nursing; protected housing with very intensive care, due to specific conditions, with an emphasis on guidance; protected housing with very intensive care, due to specific conditions, with an emphasis on care/nursing; and restorative treatment with nursing and care. Care profiles are defined according to social self-reliance, psychological/cognitive function, ADLs, mobility, nursing attention required, behavioural problems, psychiatric problems, counselling goals, structural needs for care, changes to the presentation of the disability, and the dominant foundation of care (i.e. type of disorder or condition). Funding of long-term care is linked to care profiles via care weight packages. Care weight packages are assigned a total maximum daily value, set by the Dutch Healthcare Authority, with flexible rates also applying for certain postcode areas where healthcare delivery is more expensive. For residential care, the housing component is included in the hourly prices per type of care provided in each care weight package.

New Zealand

In New Zealand, care bands are currently used and linked to resource allocation for residential care only. Assessment is carried out using the interRAI Long-Term Care Facilities Assessment System, on the basis of which residents are assigned to one of four care bands according to their level of need: rest home care (for those who are generally independent but who need some assistance or supervision), continuing care (hospital-level care for those with significant disability requiring 24-hour supervision), dementia care (for those requiring a secure environment and 24-hour supervision), and psychogeriatric care (specialised hospital care for those with major behavioural issues requiring 24-hour supervision and a high level of specialised nursing care). Residential services are purchased by district health boards to cover accommodation; needs assessment; care planning and delivery; minimum staffing; ancillary services (e.g. food and laundry); amenities and equipment; primary medical and pharmacy services; access to other health and social care services, including recreation; and quality and risk management obligations. Subsidies are means-tested and additional costs (e.g. specialised/customised equipment, personal care, and clothing) are funded privately or through other funding streams. The rollout of a care band system for home support for aged care has recently been completed in all 20 of New Zealand's health regions. The National Framework for Home and Community Support Services (HCSS) will be a nationally consistent case mix methodology for use by all district health boards. Two models of case mix classifications have been developed for older people with either complex needs or non-complex needs.

For non-complex needs, six care categories are identified. Three levels of need are used to identify service users who require support with housework only, with shopping and housework, or with shopping, housework, and personal care. Within each of these levels of need, the service user's needs may be identified as flexible (where unstable or urgent needs are identified) or stable. For complex needs, a 33-category model is proposed. Service users are assigned to one of eight categories according to low, moderate, or high level of need. They may also be identified as having brittle social support (defined as the carer reporting significant burden and stress), cognitive impairment, significant rehabilitation needs, or a combination of these characteristics. Funding mechanisms to link case mix to resource allocation have not been specified in the development of the new system.

USA

The USA has two major federal healthcare programmes: Medicare (which primarily serves those aged over 65 years and certain younger people with disabilities and end-stage renal disease) and Medicaid (a joint federal and state assistance programme for people with low incomes).

Medicare introduced a prospective case mix-based payment system for skilled nursing facilities in 1998 and for home support in 2000, which is reflected in much of the evidence included in this review. However, a new case mix reimbursement system – the Patient-Driven Groupings Model – was introduced for home support in 2020. The Patient-Driven Groupings Model has a number of levels. The first specifies the source and timing of a service user's admission to the system (admission from community or institutional care at early or late stages). The second level assigns the service user to 1 of 10 clinical groupings based on principal diagnosis. The third and fourth levels specify levels of

functional impairment and comorbidity, respectively. The model encompasses 432 different home health resource groups, or payment groups. The Patient-Driven Payment Model for residential care was introduced in 2019. Under this model, the room and board component is fixed, while variable payments are based on five additional clinical components (e.g. nursing, physical therapy). Each component has its own case mix specifications that capture patient characteristics. Payment is computed on this basis. Medicare also serves patients in long-term care facilities. In this setting, Medicare Severity Diagnosis Related Groups are used to classify patients and allocate funding on the basis of diagnosis, procedures performed, age, gender, and discharge status.

Medicaid eligibility rules and services vary substantially from state to state; for that reason, we present Minnesota as an example. Medicaid pays for nursing home care for those with limited financial resources, and for home or assisted living support if it can be obtained at a lower cost than residential care. For home support, the Minnesota Long Term Care Consultation Services Assessment Form is used to populate the case mix classification tool for several programmes. There are 13 care bands in the Minnesota case mix classification system, grouped under low, medium, and high levels of dependency for ADLs and specified by behavioural and special nursing needs. Participants are assigned an individual budget amount based on their case mix classification. For residential care, the Resource Utilization Groups IV (RUG-IV) case mix system is used. This system has 6 main categories containing a total of 48 classifications, and 2 additional Minnesota-specific classifications. Each classification is assigned a weight which is used to calculate reimbursement rates.

Question 3: Evaluations: Systematic review

Forty-six studies met inclusion criteria. Of these, 34 were based in the USA, 6 in Canada, 3 in the Netherlands, 2 in New Zealand and 1 in Australia. In critical appraisal, 20 of the 46 studies were considered of weak quality and 25 were considered moderate, with only 1 study receiving a strong rating. Study design was generally poor, with 41 studies receiving a weak rating on this criterion.

Service user outcomes

Findings from 24 studies indicate that service user health outcomes and quality of care measures appear to be relatively robust to changes in reimbursement models in both residential and home health care settings. Utilisation of services appeared to generally remain stable or decline under case mix reimbursement, while patient satisfaction also remained stable or improved. American studies suggested that case mix reimbursement incentivised more equitable access to therapy, such that increased numbers of patients received some moderate amount of therapy in skilled nursing facilities. However, there is also some evidence that financial incentives do impact on clinical practice and decision-making, serving as an important reminder that these decisions are seldom made without consideration of financial resources.

Equity

Evidence from the Netherlands under case mix reimbursement points to a pro-poor gradient in home care use after controlling for care needs; elderly home care users who are poorer convert a larger share of their entitlements into actual use compared with their wealthier counterparts, who have similar entitlements. On the whole, the Dutch care banding system seemed effective at restricting socioeconomic inequity with regard to aged care.

In the USA, data from the 1980s and 1990s pointed to barriers to access to nursing home care for patients with the heaviest care needs due to a lack of equipment and staff, along with insufficient funding to cover the costs of their care. While some improvements were made, there was still an issue reducing equity of access for those in the heaviest care requirement category. In the early 2000s, there was also some evidence that rural beneficiaries of Medicare had better access to care than their urban counterparts.

Delivery of care at the lowest level of complexity

Determining whether resource allocation through care bands delivers care at the lowest level of complexity (i.e. in the community whenever possible) is difficult, as many studies present data from

only one setting and do not document movement of service users between settings. We have therefore used proxy outcomes, including resident dependency and change in case mix, to shed light on whether residential settings under case mix reimbursement are indeed serving patients with more intense needs, suggesting that those with less intense needs are receiving care in the community.

In the USA, Medicaid case mix payment systems appeared to negatively impact on delivery of care at the lowest level of complexity during the 1980s, leading to longer hospital stays. A positive impact of Medicare and Medicaid case mix reimbursement was seen by the early and mid-2000s, with nursing homes serving higher-acuity residents after the adoption of case mix payment. However, evaluations from the USA point to the presence of 'case mix creep', which describes the preferential selection and classification of patients into the most profitable case mix groups. More patients were classified into high- and medium-intensity care bands – which had more favourable payments relative to their costs than other categories – in both residential and home health care settings.

In Canada, Australia, and New Zealand, there has been a move towards community care over time. However, this is not directly attributable to case mix classification, with some indications that this trend was already evident before the introduction of case mix reimbursement, driven by policy changes and improved availability of resources in the community. One study in British Columbia, Canada allowed for direct comparisons of utilisation data in different settings, revealing that under case mix reimbursement, utilisation of home care services increased with a corresponding decrease in utilisation of residential care services.

Costs

Fifteen studies reported on costs associated with case mix classification systems. The majority of available cost, profit, and payment rate data were USA-based, and related to the Medicaid reimbursement system. Overall, costs, profits, and payment rates increased following the implementation of case mix reimbursement systems, and case mix reimbursement methods tended to have higher costs than other methods. In the USA, both Medicare and Medicaid reimbursement rates are often mismatched to costs, and these errors should be accounted for in rate-setting methods. Medicare spending for all facility types steadily increased following implementation of the prospective payment system before coming to a plateau in the 2010s, while margins have fluctuated greatly. Studies from Canada and New Zealand did not present data prior to the implementation of case mix reimbursement systems, preventing any clear conclusions on its impact. However, Canadian data indicated that both nursing and total costs were higher for the RUG-III and Medicus classification systems than those associated with the Alberta classification system. In New Zealand, costs were higher for continuing care and psychogeriatric care compared with other categories, and cost differences were generally driven by location factors and care hour requirements for different levels of care.

Response to evaluation

In the USA, the Medicare Payment Advisory Commission has provided feedback on the introduction of the prospective payment system for home health care and long-term residential care since its inception, which has been instrumental in the development of the latest Patient-Driven Groupings Model framework.

In Quebec, Canada, the Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA) model of integrated care, based on coordination, incorporates a case mix classification system. The model was piloted in the 2000s and was ultimately adopted as the standard system of care for older people in Quebec.

Conclusions

This report provides a comprehensive overview of the care band classification systems in operation in six countries. The review highlights the impact of a range of care band classification systems that have been implemented since the 1990s. The focus of the care band systems was generally on older adults (65 years of age and over); however, the same classification system was often used for younger adults

with long-term care needs. It is possible that some care band systems are also in use for adults with particular conditions or particular needs in our case countries; however, they were not the focus of this evidence review. Our search was limited to English-language publications, and the identified studies were frequently methodologically weak, being mostly cross-sectional in design (i.e. presenting data from only one timepoint, not change across time) with limited data collected before and after system changes. We conclude that there is a very low level of certainly about the evidence using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach. Bearing these limitations in mind, we report that in some countries, costs for case mix reimbursement increased over time and tended to be higher than other reimbursement systems. There was little impact on equity, service user outcomes, or quality of care. While there is better access for clinically complex patients, this is not the case for those with the most complex needs. Any new care band system to be developed would need to take careful consideration of the unintended consequences identified in this review, particularly case mix creep.

1 Introduction

In order to enable people to continue to live at home for as long as possible, the Irish Government is committed to establishing a new statutory scheme for the financing and regulation of home-support services. The Department of Health is currently developing the new scheme, to which the *Slaintecare Implementation Strategy* (2018) and the *Programme for Government* (2020) commits.[1]

It is envisaged that all adults aged 18 years and over who are ordinarily resident in Ireland will be eligible to apply for the statutory home support scheme and to undergo a standardised assessment of their care needs. It is envisaged that a key component of the statutory scheme will be the design of a case mix classification and resource allocation model.

1.1 Case mix classification and resource allocation

Under case mix classification models, service users are allocated to subgroups according to their expected resource use. Subgroups are intended to be homogenous in terms of resource use and may also provide meaningful clinical descriptions of service users. When case mix classification is used for payment purposes, such as in prospective payment models, resources are allocated on the basis of these subgroups, rather than a fee-for-service (i.e. fee per hour of care) basis.[2]

The predictors used to classify service users may include both clinical characteristics (e.g. diagnoses) and functional and social characteristics (e.g. stability of family support); the predictive value of case mix models depends on the accuracy of these predictors.[2] Case mix classification models may take the form of a branching/hierarchical algorithm, with discrete final groups, or an additive classification, in which multiple domains of health and care are scored and summed.

The goal of case-mix models is to enable equitable distribution of resources across client groups[3] and to avoid unhelpful incentives that may arise from other models of resource allocation. For example, fee-for-service payment models can create incentives for care providers to increase the quantity of care provided irrespective of clinical need, thereby potentially reducing the independence of service users.[2]

The Department of Health recognises that a service user may move through the continuum of care and eventually need long-term residential care; therefore, there is a need to ensure that the case mix classification and resource allocation model developed for the statutory home support scheme dovetails with the model underpinning the provision of nursing home care. In response to recent independent reviews of the Nursing Home Support Scheme, the Department is committed to introducing a needs-based or care-banding approach to resource and payment allocation in the long-term residential care sector.

Accordingly, there is a particular interest in how resource allocation models using resource utilization groups have been developed internationally. The operational effectiveness of such systems is also of interest.

1.2 Review objectives

This evidence review will enhance the evidence base for the design of a bespoke case mix classification/resource allocation model for Ireland's statutory home support scheme and residential care services. The review is not intended to be a general-purpose overview of the entire field, but a targeted investigation into the specific research questions for which the Department requires comprehensive answers. The objectives of the review are to describe how care bands are used to classify care needs and how they are linked to resource allocation in six case countries, and to evaluate the evidence concerning the impact of these systems on a range of relevant variables.

1.3 Research questions

The following questions were agreed with the Department of Health:

1. Describe the use of care bands to classify care needs in six case countries.

a) Are care bands used to classify the assessed care needs of prospective users of home support services or residential care, or both?

b) What care bands are used? (To include definitions, number of bands, and who classifies the care bands.)

c) How is mobility between care bands enabled, ensuring responsiveness to service users' changing care needs (e.g. moving to more or less intensive care)?

d) How are decisions on the care banding of service users reviewed, and what mechanisms are in place to enable service users to appeal decisions made in relation to their care band allocation?

2. Describe the linking of care bands to service or resource allocation.

   a) How are care bands used? Are they confined to classifying people's levels of care need, or do they define the type/quantum of services/care for which people are eligible or the funding available (i.e. to what extent are care bands utilised to underpin resource allocation)?

   b) Where care bands are linked to resources, how is the amount/value of the resource determined?

   c) Where care bands are linked to resources, what funding models/mechanisms are utilised to underpin the resource allocation provided?

3. What is the service user, health system, and Exchequer experience of resource allocation through care bands?

   a) Is there evidence to demonstrate that resource allocation through care bands:

      - Provides better outcomes for service users
      - At system level, supports equity of access to services across the continuum of care
      - Delivers care at the lowest level of complexity, i.e. in the community, whenever possible, and
      - Provides value for money for the Exchequer?

   b) How were the evaluations carried out? What were the main evaluation findings and what changes have been made in response to these?

Questions 1 and 2 will be answered using descriptive country case studies, and Question 3 will be answered through a systematic review of the empirical literature.

2 Methodology

2.1 Choice of countries

Countries were considered for this review based on their use of standardised case mix models in both the home care setting and in long-term residential care facilities.

A systematic review by van den Bulck *et al.*, published in 2020, aimed to identify existing scientific evidence on the configuration of international case mix models developed and/or implemented for prospective payment of home healthcare.[2] This review identified models from five countries: the United States of America (USA), Australia, Canada, Germany, and New Zealand. According to the International Resident Assessment Instrument (interRAI) website, Canada, Germany, and New Zealand are using a version of the interRAI Long-Term Care Facilities Assessment System, and the USA is using a modified version of this.[4] We have therefore included these five countries in this evidence review. In collaboration with the Department of Health, the Health Research Board (HRB) has also selected the Netherlands to give further coverage of case mix classification and resource allocation in Europe. The Netherlands is in the process of developing a case mix classification system for home support with a view to introducing a prospective payments system, and the Netherlands also uses a version of the interRAI Long-Term Care Facilities Assessment System.[4,5]

The term "home support" covers a wide range of services that support older adults to remain in their own homes and to support informal carers. The scope of home support services varies significantly between countries; personal care services, household tasks (e.g. groceries, house cleaning, home maintenance), allied health, social support, technical nursing, medical care, planned and unplanned respite care, assistive devices, home modification, and medication management may be included or excluded from the definition of home support in different systems. For Questions 1 and 2, we have endeavoured to specify what services are covered by home support in each country. For Question 3, we included studies that examined the use of care bands in home support services of any kind, without restriction on the types of services provided.

For our evaluation of long-term residential care settings, we excluded supported living settings for older adults, as colleagues at the Health Research Board Evidence Centre, led by Camille Coyle, have recently published an extensive evidence review on housing with support for older people.[6]

2.2 Terminology

The international literature contains a wide variety of terms to describe methods of classifying patients into groups on the basis of their anticipated resource use (case-mix classifications, care bands, patient classification models, diagnostic-related groups, resource utilisation groups). The term "care bands" will be used throughout this report as a catch-all term to standardise the language.

Similarly, although not all care needs are met by resource allocation (e.g. needs met by informal carers or by other parts of health services), many studies and countries describe care band classifications being based on "care needs" rather than “anticipated resource use”, as shorthand for care needs to be met by the system in question. We will do the same in this report, though we acknowledge the subtle but important distinction.

2.3 Country case studies

Questions 1 and 2 relating to model description were answered using country case study methodology.

2.3.1 Eligibility criteria

As there is considerable overlap in the materials that will be used to answer Questions 1 and 2, we have developed combined eligibility criteria, which are given in Table 1. We have searched for records

from 1990 onwards, as the earliest published model included in the van den Bulck *et al.* review was from 1993.[2] This date limit is also aligned with the residential care literature; while Resource Utilization Groups (RUG) were first developed in the early 1980s, they became more widely used in the early 1990s, after the use of the Resident Assessment Instrument (RAI 2.0) in nursing homes became mandated for many nursing homes in the USA and following the development of the third version of the RUG (RUG-III).[3,7]

Where responsibility for home care or long-term residential care is devolved to a state or a regional health authority in a particular country, one case study state or health authority was selected for that country based on the best availability of data.

Table 1 Eligibility criteria for Questions 1 and 2

Criterion	Inclusion	Exclusion
Patients	Adults aged ≥18 years, including those with dementia	Models specifically for subgroups of patients with a particular illness, e.g. fractures
Intervention	Case mix classification, with or without resource allocation	Models which do not cover either component
Comparator	N/A	
Setting	Home care and/or long-term residential care	Other settings
Funding source	National/state-funded schemes	Private/insurance-led schemes
Outcomes	Any data which answer Questions 1 and 2	-
Study design	Any primary or secondary work, e.g. systematic reviews, grey literature, governmental reports	Opinion pieces
Location	Australia, Canada, Germany, New Zealand, the Netherlands, the USA	Other locations
Year	1990–present	Pre-1990
Language	English-language publications	Non-English-language publications

2.3.2 Identifying research evidence

Targeted searches of relevant websites were used to answer descriptive questions on the case mix classification and resource allocation models in different countries. Website content and grey literature reports embedded on the websites were included. Searches were carried out using English-language queries. Google Translate was used to translate relevant material; however, in-depth non-English searches were not carried out. Due to limitations of time and resources, it was not feasible to carry out consultations with experts from each country of interest.

2.3.3 Data synthesis

Data were summarised for each country under the headings provided by the research sub-questions (see Section 1.3).

2.4 Systematic review methods

Question 3 was addressed using standard systematic review methods.

2.4.1 Eligibility criteria

The eligibility criteria for Question 3 are indicated in Table 2.

Table 2 Eligibility criteria for Question 3

Criterion	Inclusion	Exclusion
Patients	Adults aged ≥18 years, including those with dementia	Models specifically for subgroups of patients with a particular illness, e.g. fractures
	>10 patients in the study	≤10 patients in the study
Intervention	Case mix classification, with or without resource allocation	Models which do not cover either component
Comparator	Any, including no comparator	-
Setting	Home care and/or long-term residential care	Other settings
Funding source	National/state-funded schemes	Private/insurance-led schemes
Outcomes	Outcomes for service users: quality of care, patient satisfaction	-
	Equity	
	Value for money/cost-effectiveness	
	Delivery of care at the lowest level of complexity	
	Response to evaluation	
Study design	Evaluations	Opinion pieces
		Model development studies
		Validation of models/tools for use in another jurisdiction
Location	Australia, Canada, Germany, New Zealand, the Netherlands, the USA	Other locations
Year	1990–present	Pre-1990
Language	English-language publications	Non-English-language publications

2.4.2 Identifying research evidence

In order to answer the question on evaluations of various models, a comprehensive and systematic search process was carried out, including database searches, supplemental searches involving citation searching, and a final brief search of databases at the end of the review process to capture any newly published material or previously unseen material.

The stages of the evidence-gathering process included the comprehensive searches of databases and other information resources, screening of these results, and reference/citation searching of the included articles. A two-stage double-screening process was used, involving title/abstract and full-text screening with four screeners.

The search was based around the concepts of case mix and care setting. The aspect of case mix that was of interest in this review was its use in the allocation of resources for care, rather than its use in assessing, for example, the frailty levels of patients. The care settings of interest were the home and residential settings.

As described in Section 2.1, six countries or regions were selected as being of particular relevance, which should give a wide range of case mix approaches in order to understand the mechanisms involved. The countries or territories chosen were Australia, Canada, Germany, the Netherlands, New Zealand, and the USA. These regional limits were incorporated into the search. The main concepts were combined, as illustrated figuratively in the Venn diagram in Figure 1.

Results published before the 1990s were not of interest for this review, for the rationale outlined in Section 2.3.1.

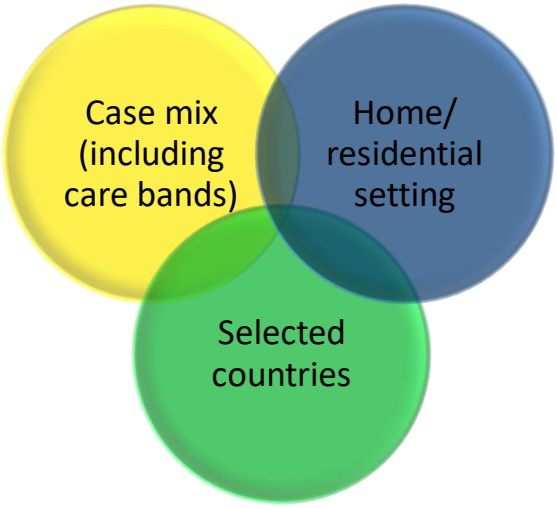

Figure 1 Search strategy concepts

After discussions with the review team, scoping searches were carried out in Ovid MEDLINE, Ovid Social Policy and Practice, and Google Scholar. Relevant reviews and research were followed up on in order to examine the type of material that had been referenced in producing the work. From this preliminary work, it was clear that terminology would vary across publications, regions, and search resources. A broad search was necessary, aiming more for sensitivity (capturing as many relevant papers as possible at the cost of including irrelevant material) than specificity (most results in scope at the cost of missing relevant papers). While this approach would return a large amount of out-of-scope items with the results, the screening process, carried out by experienced researchers, was estimated to be a more accurate mechanism to disambiguate relevant papers from results which contain the correct terminology but are not on the specific topic of the review.

2.4.2.1 Search resources and terminology

The databases and resources selected for use with this search were Ovid MEDLINE, Ovid Social Policy and Practice, EBSCO SocINDEX with Full Text, EBSCO CINAHL Complete, Wiley's Cochrane Library, Core.ac.uk (created by the Open University and Jisc), Google Scholar, and Google. The van den Bulck *et al.* review was treated as a core review, and the references of that review were also included at this stage of the search.[2]

The initial search was designed for Ovid MEDLINE and was then translated for use with other databases and resources. Terminology for this search was derived from reviewing the results of scoping searches and harvesting relevant words, phrases, and Medical Subject Heading (MeSH) thesaurus terms. PubReMiner was used to build on these terms with additional 'free' terms and MeSH terminology.[8] Searches in Google also returned non-academic results containing relevant phrases and terminology. These terms were combined using Boolean logic to build a search strategy.

Complex structured searching was not supported in all resources (for example, Google and Google Scholar), so for these resources, simpler search strategies were used. In the case of Google, test searches returned large numbers of nursing home and care service websites, and so only an abbreviated search was used in this case. Detailed search strategies can be found in Appendix A.

One of the inclusion criteria for the review was that only material published after 1990 would be included; therefore, a date limit of 1990–present was used in databases which returned larger

numbers of results. Where the numbers of results (and the numbers of results dated pre-1990) were lower, the date limit was not used.

Final searches for this stage of the review were carried out between 19 and 27 August 2020. The results of each search were uploaded to EndNote X9.3. Deduplication was carried out in EndNote, resulting in 4,224 results. The deduplicated results were transferred to Excel worksheets for screening.

2.4.2.2 Screening

Due to the large number of results, double screening was carried out using two teams of two screeners (JQ and CL; TM and DP). The set of results was divided in two. Each pair of screeners double-screened one set of results by title and abstract, so that each citation was examined separately by two screeners. Once all items had been double-screened, the individual inclusion/exclusion verdicts were compared where the verdicts did not agree. A consensus verdict was achieved through further examination of the papers. Papers with no abstract were moved forward to the full-text assessment, unless the title indicated the study was completely out of scope. Duplicate papers were flagged and one of each pair was excluded.

Full-text papers were sourced for the citations included from the title and abstract screening (n=199). These papers were then read closely and screened in Excel, using the same inclusion and exclusion criteria as before. Reasons for exclusion were recorded for any excluded papers. These can be seen in Appendix B. After this full-text screening, 22 papers were selected as most closely matching the review topic. These covered all six countries/regions of interest.

2.4.2.3 Reference and citation searching

Citation/reference chasing was carried out on the 22 papers selected for inclusion. Reference chasing was carried out using the complete reference lists published in each paper. Citation chasing was carried out using the citation counts for each paper in Google Scholar. All results were entered into an EndNote library and deduplicated. After deduplication, 1,201 results remained, which were initially screened by the information specialist (CL) to remove previously screened or previously included papers, and to remove papers that were completely out of scope. This screening used the eligibility criteria. The final results were screened by the lead researcher (JQ) for inclusion in the final analysis, and 32 papers were selected to be included in the final analysis.

2.4.2.4 Final searches

A final set of abbreviated searches were carried out in Ovid MEDLINE, RePEc, and Google Scholar on 25 November 2020 in order to ensure that no new relevant papers had been missed. From these last searches, 11 papers were selected for inclusion in the final synthesis. In total, 65 papers were included from the search process.

2.4.3 Data extraction

Data were extracted by a single reviewer into a bespoke extraction sheet in Microsoft Excel. Journal websites for the included articles were checked for supplementary data and errata. Extracted data were verified independently by a second reviewer against a clean copy of the publication.

2.4.4 Quality assessment

We used the Effective Public Healthcare Panacea Project's Quality Assessment Tool for Quantitative Studies to critically appraise the included studies.[9]

2.4.5 Data synthesis

Data were narratively summarised according to the outcomes of interest.

3 Model descriptions: Country case studies

1. Describe the use of care bands to classify care needs in six case countries.
    a) Are care bands used to classify the assessed care needs of prospective users of home support services or residential care, or both?
    b) What care bands are used? (To include definitions, number of bands, and who classifies the care bands.)
    c) How is mobility between care bands enabled, ensuring responsiveness to service users' changing care needs (e.g. moving to more or less intensive care)?
    d) How are decisions on the care banding of service users reviewed, and what mechanisms are in place to enable service users to appeal decisions made in relation to their care band allocation?
2. Describe the linking of care bands to service or resource allocation.
    a) How are care bands used? Are they confined to classifying people's levels of care need, or do they define the type/quantum of services/care for which people are eligible or the funding available (i.e. to what extent are care bands utilised to underpin resource allocation)?
    b) Where care bands are linked to resources, how is the amount/value of the resource determined?
    c) Where care bands are linked to resources, what funding models/mechanisms are utilised to underpin the resource allocation provided?

This section provides answers to Questions 1 and 2 for each of the six included countries: Australia, Canada, Germany, the Netherlands, New Zealand, and the USA. Healthcare in Canada is the responsibility of the provincial/territorial governments; therefore, we have provided full information for only one province (Alberta) and summary information for all the other provinces and territories. Alberta has a long history of using case mix classification, and the latest system, launched in 2010, has recently been evaluated. For these reasons, Alberta was selected for detailed analysis in this section. Table 3 displays a summary of the key features of home support and residential care systems in each country.

Table 3 Key features of home support and residential care systems in the included countries

	Australia	Canada (Alberta)	Germany	New Zealand	Netherlands	USA
Care bands used in home care or residential care	Both	Residential	Both	Residential (system in development for home support)	Both	Both
Home care linked to resource allocation	Yes	No	Yes	No	Yes	Yes
Residential care linked to resource allocation	Yes	Yes	Yes	Yes	Yes	Yes
Shared system across settings	No	No	Yes	No	Yes	No

As can be seen in Table 3, home support and residential care are governed by separate systems in Australia, Canada (Alberta), New Zealand, and the USA. For these countries, our analysis is therefore organised by setting: overall background information is provided, followed by answers to all questions for home support, and then by answers to all questions for residential care. In Germany and the

Netherlands, a single system is shared across home support and residential care. The analysis for each of these countries is therefore organised by research question: background information is provided, followed by answers to Question 1 for both home support and residential care, and then by answers to Question 2 for both home support and residential care.

3.1 Australia

3.1.1 Background

Australia has a universal public health insurance programme, Medicare, which is regionally administered and financed through general tax revenue and a government levy. Public hospital care is free for citizens and substantial coverage is provided for physician services and pharmaceuticals. Approximately one-half of Australians purchase private supplementary insurance to cover private hospital care, dental services, and other services. Funding and indirect support for patient care are provided at the federal level, while public hospitals and dental care, community healthcare, and mental health care are managed at the state level.[10]

Funding for home support and residential care for younger adults is provided by the National Disability Insurance Scheme. This is allocated based on what is reasonable and necessary to meet the individual's care needs, without reference to any case-mix or care-banding system.[11] Our discussion of use of care bands in the Australian system will therefore refer only to care for older adults.

3.1.1.1 Aged care

Aged care in Australia is provided in the home, in the community, and in residential aged care facilities by a variety of providers, and is primarily funded and regulated by the Australian Government under the provisions of the Aged Care Act 1997.

Government-funded care is available for those aged 65 years and older (50 years and older for Indigenous Australians) who can no longer live in their own home without support, with eligibility for funding based on their health status and existing supports. Government spending on aged care services, largely by the federal Australian Government, was AU$18.4 billion in 2017–18. As at June 2018, there were around 783,000 people receiving support through the Commonwealth Home Support Programme, 91,800 people receiving a Home Care Package, and 180,900 people in permanent residential care.[12]

Prospective service users may self-refer for assessment. Aged care in Australia is classified under three broad categories: home support, short-term care (short-term restorative care, transition care after a hospital stay, and respite care), and residential care.

Entry-level support is provided through the Commonwealth Home Support Programme, which provides low-intensity support in the home or in the community. For older people with more intense or frequent care needs, Home Care Packages are provided at one of four levels, providing ongoing personal and social support and clinical care. Residential care is provided in aged care homes on a permanent or respite basis.

Aged care is currently funded through a mix of public funding from general tax revenue, private contributions through means-tested fees and co-payments for certain services, and a mix of public and private capital funding. Subsidies for home support and residential care are linked to the needs of the individual service user or the case mix of the aged care facility. Service users may be asked to contribute to the costs of their care if they have the means to do so.

In 2018–19, 75.4% of the annual cost of aged care was paid by the Australian Government, 20.7% was paid by recipients of care through means-tested fees, 1.1% was paid by state and territory governments through tax revenue, and the remaining 3.8% was paid from other sources.[13]

3.1.1.2 Recent reforms

The Commonwealth Home Support Programme was introduced in 2015, consolidating the following Commonwealth-funded aged care programmes:

- The Commonwealth Home and Community Care (HACC) Program
- The National Respite for Carers Program (NRCP) (planned respite care)
- The Day Therapy Centres Program, and
- The Assistance with Care and Housing for the Aged (ACHA) Program.

Victoria and Western Australia transitioned to the Commonwealth Home Support Programme in 2016 and 2018, respectively, creating a nationally accessible programme.[14]

Income testing for Home Care Packages was introduced in 2014 and, since 2015, Home Care Packages have been consumer-directed, providing the service user with additional choices about their care and care providers.[15]

Resident classifications for case mix and funding purposes have been in place in Australia for some time. The Resident Classification Instrument was introduced in 1988, under which a 14-item measure of dependency was used to assign nursing home residents to five resident categories for the purposes of allocating funding. The Personal Care Instrument was introduced in 1992 to expand upon this measure, using 16 items to assign residents to one of three levels of subsidy for residential care or to 'hostel care' only. Hostel care was, until 1997, a style of low-care nursing home that provided accommodation, social support, and assistance with tasks of daily living (such as dressing, meals, housekeeping, and mobility) for service users with low-intensity care needs. The process of integrating nursing homes and hostels into one system for planning, administration, and funding purposes began in 1997. The Resident Classification Scale was introduced in the same year. Similar to the Residential Classification Instrument, this tool comprised 20 items, each with four levels of dependency, and was used to classify residents into one of eight categories, each with an associated level of funding. This was used for both high- and low-care facilities (i.e. nursing homes and hostels).[16] The present classification system, the Aged Care Funding Instrument, was introduced in 2008.

3.1.1.3 Future reforms

The Australian National Aged Care Classification (AN-ACC) is a proposed new funding model for residential aged care, developed by the Australian Health Services Research Institute. A trial of the AN-ACC assessment framework was completed in March 2020. This model categorises residential care service users into 13 classes based on care needs, upon which government subsidies for residential aged care providers are partially based.[17]

The outcomes of a trial of the AN-ACC assessment framework were published in August 2020.[18] A year of 'shadow assessment' will commence in the first half of 2021, funded by the Australian Government, during which all existing and new residents of aged care facilities will be assessed using the AN-ACC tool and assigned to a class within the framework. As of October 2020, no final decision had been made by the Australian Government to implement funding reform using the AN-ACC assessment framework. If this decision is taken, funding will be paid using this model beginning in 2022.[19]

3.1.2 Home support

3.1.2.1 Describe the use of care bands to classify care needs

Care bands are used to classify the assessed care needs of prospective users of home support. Prospective service users are assessed using the National Screening and Assessment Form, on the basis of which they are deemed eligible for entry-level home support (through the Commonwealth Home Support Programme), a Home Care Package (at one of four levels), or residential care in accordance with the *ACAT Guidance Framework for Home Care Package Level*.[20]

Prospective users may self-refer for assessment through an online application. Where the initial application by the prospective service user suggests that low-level support is required, assessments for home supports are carried out by a Regional Assessment Service assessor, and support is provided through the Commonwealth Home Support Programme. Where a more comprehensive assessment is

required, this is conducted by a member of an Aged Care Assessment Team.[21] Each Aged Care Assessment Team is multidisciplinary and includes healthcare workers from a range of disciplines, including medicine, nursing, social work, physiotherapy, occupational therapy, and psychology.[22] In either case, the National Screening and Assessment Form is used.

Based on the assessment, the *ACAT Guidance Framework for Home Care Package Level* is used to assign eligible service users to an appropriate level of service according to the frequency, intensity, and complexity of services required.

The framework consists of two stages. Stage 1 identifies the service user's needs at one of four levels across each of five domains of care: social, physical, medical, psychological, and complexity/vulnerability. Each domain comprises a number of categories, as shown in Table 4.[20] Stage 2 defines five levels of support corresponding to the levels of need identified in Stage 1.

Table 4 Levels of service user needs, Stage 1 of *ACAT Guidance Framework for Home Care Package Level*

Domain	Level	Categories and service user needs
Social	Level 1	• Social and community participation: Minimal assistance needed • Family and other support networks: Connects with minimal assistance • Sustainability of caring relationships: Carer needs occasional support
	Level 2	• Social and community participation: Moderate (regular) assistance needed • Family and other support networks: Connects with moderate (regular) assistance • Sustainability of caring relationships: Carer needs moderate support at regular intervals
	Level 3	• Social and community participation: High-level (frequent) assistance needed • Family and other support networks: Social isolation – minimal contacts • Sustainability of caring relationships: Signs of carer stress – high-level (frequent) support needed
	Level 4	• Social and community participation: Unable to engage without full assistance • Family and other support networks: Social isolation – no contacts • Sustainability of caring relationships: Unsustainable caring arrangements – comprehensive support needed
Physical	Level 1	• Function (activities of daily living (ADLs) and instrumental activities of daily living (IADLs)): Minimal assistance needed • Physical health: Minimal management needed • Personal health: Minimal management needed
	Level 2	• Function (ADLs and IADLs): Moderate (regular) assistance needed • Physical health: Moderate (regular) management needed • Personal health: Moderate (regular) management needed
	Level 3	• Function (ADLs and IADLs): High-level (frequent) assistance needed • Physical health: High-level (frequent) management needed • Personal health: High-level (frequent) management needed
	Level 4	• Function (ADLs and IADLs): Comprehensive assistance needed • Physical health: Specialised management needed • Personal health: Specialised management needed
Medical	Level 1	• Health conditions: No or minimal (infrequent) management needed

Domain	Level	Categories and service user needs
		• Medication management: No or minimal (infrequent) medication management needed • Allergies and/or sensitivities: No or minimal assistance/monitoring
	Level 2	• Health conditions: Moderate (regular) management needed • Medication management: Moderate (regular) medication management needed • Allergies and/or sensitivities: Needs some assistance/monitoring
	Level 3	• Health conditions: High-level (frequent) management needed • Medication management: High-level (frequent) medication management needed • Allergies and/or sensitivities: Needs frequent assistance/monitoring
	Level 4	• Health conditions: Complex management needed • Medication management: Complex medication management needed • Allergies and/or sensitivities: Unable to manage – full assistance needed
Psychological	Level 1	• Cognition: No or minimal impairment • Behavioural management issues: No issues, or issues are well managed with intermittent intervention • Psychosocial: No issues, or issues are well managed with intermittent intervention
	Level 2	• Cognition: Mild cognitive decline • Behavioural management issues: Issues require minimal (infrequent) intervention • Psychosocial: Issues require minimal (infrequent) intervention
	Level 3	• Cognition: Moderate cognitive decline • Behavioural management issues: Issues require moderate (regular) intervention • Psychosocial: Issues require moderate (regular) intervention
	Level 4	• Cognition: Severe cognitive decline • Behavioural management issues: Issues require frequent intervention • Psychosocial: Issues require frequent intervention
Complexity/vulnerability	Level 1	• Complexity and/or risk of vulnerability: No complexity or vulnerability concerns
	Level 2	• Complexity and/or risk of vulnerability: Low-level complexity and/or some vulnerability concerns
	Level 3	• Complexity and/or risk of vulnerability: Moderate complexity and/or very vulnerable
	Level 4	• Complexity and/or risk of vulnerability: High-level complexity and/or extremely vulnerable

Source: Adapted from Australian Government (Department of Health), 2018[20]

A service user or their carer may request a reassessment when their needs or care circumstances change. The home care provider is required to review a service user's care plan at least once every 12 months, when requested by the service user or their carer, if the service user's interim package is upgraded to the higher-level package for which they have been approved, or if there has been a change in the service user's package budget. The provider may also initiate a review when the service user's needs or care circumstances change or where use of clinical services is ongoing or increasing. An additional assessment by the Aged Care Assessment Team may be required where the service

user's needs have increased significantly. Where changes are made to a care plan, the package budget is also updated accordingly.[23]

Prospective service users who disagree with an assessment decision are not able to request a reassessment, but are invited to contact their assessor in the first instance. If they still have concerns, they can request a review of the decision free of charge by writing to the Secretary of the Department of Health within 28 days. Following this, they may escalate to the Administrative Appeals Tribunal for a fee.[24]

3.1.2.2 Describe the linking of care bands to service or resource allocation

Stage 2 of the *ACAT Guidance Framework for Home Care Package Level* defines five levels of support corresponding to the levels of need identified in Stage 1. The framework also specifies the maximum government subsidy available at each level.[20]

The types and intensity of services that may be required at each level of support (e.g. assistance with household activities, complex nursing care, etc.) are also described. Levels of complexity, vulnerability, risk, and the frequency and intensity of service needs increase through the levels of support.[20]

The five levels of support are shown in Table 5.

Table 5 Support available based on level of service user needs, Stage 2 of *ACAT Guidance Framework for Home Care Package Level*

Level	Supports available	Australian Government subsidy (2018)
Commonwealth Home Support Programme	Entry-level support services (such as garden maintenance, house cleaning, or meals on wheels), which are episodic and can be delivered independently without a requirement for coordination or case management. Should be short-term, with a focus on wellness and/or reablement.	<AU$8,000
Level 1 Basic level of home care	Some coordination is required to deliver services to assist with activities (predominantly in the social and physical domains). Services such as allied health, social support, or transport could be included, as well as minimal assistance with undertaking housework or preparing meals.	AU$8,000
Level 2 Low level of home care	Coordination of services to provide regular assistance with activities (predominantly in the social, physical, and medical domains). Services such as personal care, medication management, and social support could be included, as well as moderate assistance with activities such as undertaking housework, going shopping, or preparing meals.	AU$14,500
Level 3 Intermediate level of home care	Coordinated, hands-on care for frequent assistance with activities (predominantly in the social, physical, and medical domains, although users may also need intervention for needs identified in the psychological domain). Services such as high-level management for incontinence, assistance with showering, and coordinated management of behavioural or safety issues could be included.	AU$32,500
Level 4 High level of home care	Complex nursing care for assistance with activities (predominantly in the social, physical, and medical domains). Needs identified in the psychological domain may be present with a high level of complexity/vulnerability. Services such as management of stoma, pain, and medication could be included. The client may also have limited mobility and need assistance with transfers (equipment needed).	AU$49,500

Source: Adapted from Australian Government (Department of Health)2018[20]

The Commonwealth Home Support Programme is generally not available to service users with a Home Care Package; however, the Commonwealth Home Support Programme can be used to supplement Home Care Packages under the following circumstances, when the Home Care Package budget is already fully allocated:

1. In case of a setback, such as a fall, service users on Level 1 or 2 of a Home Care Package may receive short-term or episodic allied health, therapy, or nursing services to recover from the setback.
2. Additional short-term planned respite services may be accessed where the carer requires it for service users on Levels 1, 2, 3, or 4 of a Home Care Package.
3. Additional short-term services can be provided on an emergency basis – for example, when a carer is unable to maintain their role – for service users on Levels 1, 2, 3, or 4 of a Home Care Package.[20]

There was no information available on how the amount or value of the resource is determined.

The government subsidies (as of 2018) for each level of the *ACAT Guidance Framework for Home Care Package Level* are shown in Table 5. Subsidies for each Home Care Package level are specified as a flat daily rate. The flat daily rates, as at 20 September 2020, are as follows:[25]

- Level 1: AU$24.46
- Level 2: AU$43.03
- Level 3: AU$93.63, and
- Level 4: AU$141.94.

Supplements apply for particular groups (e.g. those with dementia, those with cognitive difficulties, veterans, those who require oxygen, those who require enteral feeding). Additional supplements apply based on hardship and/or the location of the service user (with reference to an area's Accessibility and Remoteness Index of Australia (ARIA+) score and Modified Monash Model, which defines an area as 'city', 'rural', 'remote', or 'very remote').[25]

Government subsidies are paid in advance, based on claim entitlements from previous months, directly to the home care provider. Subsidy payments are made through the Services Australia aged care payment system.

Subsidies are income-tested and service users may be required to pay a contribution. This contribution is paid fortnightly or monthly and may include the following:

- A basic daily fee, set at a percentage of the single basic age pension. This fee varies depending on the level of the Home Care Package and is updated biannually in line with the age pension.
- An income-tested care fee, based on individual income. Full pensioners do not pay this fee, and annual and lifetime caps apply for varying levels of income.

The service user may pay additional fees for extra care and services not covered by the Home Care Package.[26] Home Care Package costs and fee subsidy reductions apply if the service user is entitled to personal injury compensation that covers some or all of the cost of their home care.[27]

3.1.3 Residential care

3.1.3.1 Describe the use of care bands to classify care needs

3.1.3.1.1 Residential care

Care bands are used to classify the assessed care needs of prospective users of residential aged care. The Aged Care Funding Instrument is used to define the care needs of residents at four levels in each

of three domains. Government subsidies are allocated to residential aged care providers in part on the basis of this classification of residents.
The Aged Care Funding Instrument is used to classify residents' assessed care needs under three domains: ADLs, behaviour, and complex healthcare. Care needs for each domain are designated at one of four levels – nil, low, medium, or high – which are then linked to funding for residential care. Care needs are assessed by the residential care provider at least 7 days after the resident enters care and before the resident has been in care for 2 months.[28]

The Aged Care Funding Instrument comprises 12 questions, each of which belongs to one of the three domains:

- ADLs: Questions 1–5, comprising nutrition, mobility, personal hygiene, toileting, and continence. Each question is ranked A, B, C, or D according to intensity of care need, each of which has a corresponding numerical score. The total score for the five questions determines the level of need for this domain – nil, low, medium, or high.
- Behaviour: Questions 6–10, comprising cognitive skills, wandering, verbal behaviour, physical behaviour, and depression. As with the ADLs domain, each question is ranked A, B, C, or D according to intensity of care need, each of which has a corresponding numerical score. The total score for the five questions determines the level of need for this domain – nil, low, medium, or high.
- Complex healthcare: Questions 11–12, comprising medication and complex healthcare. A rating is given to each question (A, B, or C for medication and A, B, C, or D for complex healthcare). These ratings are applied to a matrix to determine the level of need for this domain – nil, low, medium, or high.

Table 6 provides further details for each of the 12 questions.[29]

Table 6 The Aged Care Funding Instrument

Question	Components	Measurement	Scoring
ADLs			
1 Nutrition	Readiness to eat Eating	Assistance level: independent OR supervision OR physical assistance	Scored A, B, C, or D based on combinations of scores on component care needs
2 Mobility	Transfers Locomotion	Assistance level: independent OR supervision OR physical assistance OR mechanical lifting equipment	Scored A, B, C, or D based on combinations of scores on component care needs
3 Personal hygiene	Dressing Washing Grooming	Assistance level: independent OR supervision OR physical assistance	Scored A, B, C, or D based on combinations of scores on component care needs
4 Toileting	Use of toilet Toilet completion	Assistance level: independent OR supervision OR physical assistance	Scored A, B, C, or D based on combinations of scores on component care needs
5 Continence	Urinary continence Faecal continence	Frequency	Scored A, B, C, or D based on combinations of scores on component care needs

Question	Components	Measurement	Scoring
Behaviour			
6 Cognitive skills	Needs arising from cognitive impairment	Psychogeriatric Assessment Scales – Cognitive Impairment Scale, or assessment of memory, personal care, orientation, and communication difficulties where Cognitive Impairment Scale is not appropriate	Scored A, B, C, or D based on no or minimal impairment, mild impairment, moderate impairment, or severe impairment, respectively
7 Wandering	Wandering behaviour assessment summary Wandering checklist	Behaviours recorded and frequency of wandering	Scored A, B, C, or D according to frequency of wandering (none or less than 2 days per week, at least 2 days per week, at least 6 days per week, or twice a day or more at least 6 days per week, respectively)
8 Verbal behaviour	Verbal behaviour assessment summary (verbal refusal of care, disruption to others, paranoid ideation that disturbs others, sexually inappropriate verbal advances) Verbal behaviour checklist	Behaviours recorded and frequency of verbal behaviours	Scored A, B, C, or D according to frequency of verbal behaviour (none or less than 2 days per week, at least 2 days per week, at least 6 days per week, or twice a day or more at least 6 days per week, respectively)
9 Physical behaviour	Physical behaviour assessment summary (physically threatening or doing harm to self/others/property, socially inappropriate behaviour that impacts on other residents, constant physical agitation) Physical behaviour checklist	Behaviours recorded and frequency of physical behaviours	Scored A, B, C, or D according to frequency of physical behaviour (none or less than 2 days per week, at least 2 days per week, at least 6 days per week, or twice a day or more at least 6 days per week, respectively)
10 Depression	Symptoms of depression	Cornell Scale for Depression Symptoms of depression checklist	Scored A, B, C, or D based on combination of Cornell Scale for Depression scores, symptoms of depression, and diagnosis or previous diagnosis within specified time frame
Complex healthcare			
11 Medication	Independence in self-managing medication	7-item checklist	Scored A, B, or C based on combination of items checked on checklist

Question	Components	Measurement	Scoring
12 Complex healthcare	Complex healthcare procedures required	18-item checklist of complex healthcare procedures, in which each item carries a corresponding score	Scored A, B, C, or D based on total score of items checked on checklist

Source: Adapted from Australian Government (Department of Health), 2016[29]

Reappraisal using the Aged Care Funding Instrument must be conducted when the resident's classification expires (usually 1 month before expiry) or on request from the Department of Health. Reappraisals can also be conducted 12 months after the resident's classification took effect, any time when the resident is classified at the lowest level, within 2 months of the resident transferring where the new provider does not agree with their classification, when there is a significant change in the resident's care needs, or when the resident has been incorrectly classified at the lowest level.[28]

Applications for classification may be reviewed; if the prospective service user does not agree with the review decision, they may seek a reconsideration.[28]

3.1.3.1.2 AN-ACC

The AN-ACC is a proposed new funding model for residential aged care, developed by the Australian Health Services Research Institute. A trial of the AN-ACC assessment framework was completed in March 2020. This model categorises service users of residential care into 13 classes based on care needs, upon which government subsidies for residential aged care providers are partially based.[17]

The designers of the AN-ACC describe the Aged Care Funding Instrument as an additive model, whereby service users receive scores on a variety of items, with higher funding being assigned to service users with higher total scores. They argue that the AN-ACC, which is a branching model rather than an additive model, better reflects the totality of service users' care needs, as it considers them in combination rather than as discrete items to be met independently of one another.[30]

The AN-ACC assessment tool is used to categorise residents into 1 of 13 classes, based on end-of-life care needs, frailty, functional status, cognition, behaviour, and technical nursing needs.[17] The first class is for residents who are to be admitted for palliative care. The remaining classes may be grouped under three 'branches' based on level of mobility (independent, assisted mobility, not mobile), within which combinations of other variables are used to define the classes, including the presence or absence of compounding factors (see Figure 2):[31]

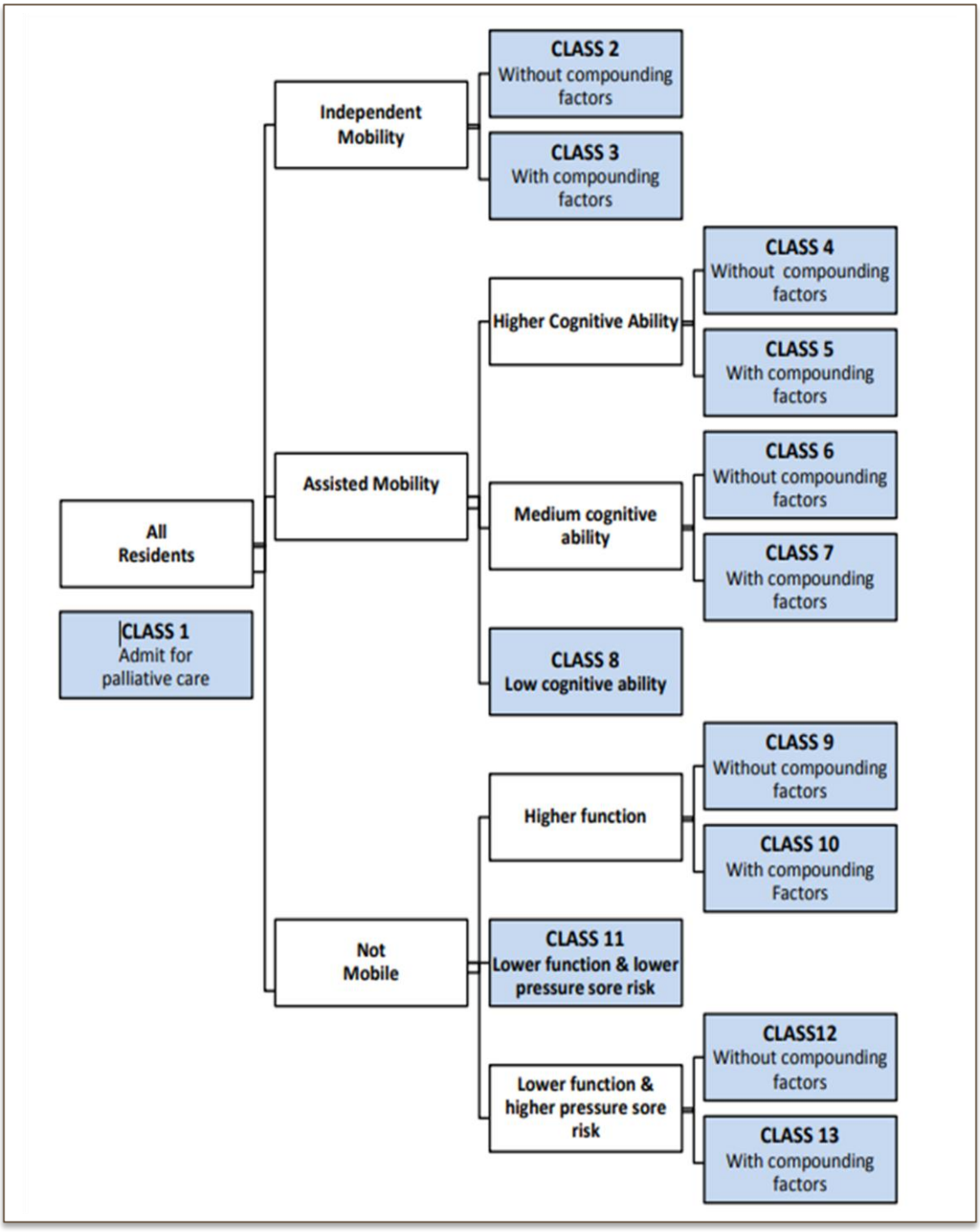

Figure 2 The Australian National Aged Care Classification

Source: McNamee *et al.,* 2019[32]

Assessment may be conducted by trained assessors prior to entry or within the first 4 weeks of the resident's entry into care. Assessors should be registered nurses, occupational therapists, or physiotherapists. Assessment is based on a range of strategies, including observation, conversations with key informants, and document review. Responsibility for care planning remains with the care home staff.[31]

The model demonstrated good stability and reliability in a study using test-retest methodology with a test dataset and validation dataset of 1042 and 613 records respectively.[33]

The AN-ACC allows for reassessment and reclassification to a higher-paying class if the resident's needs change significantly, following either a specific event or deterioration over time. The framework outlines three grounds or triggers for reassessment: significant hospitalisation, significant change in mobility, or after a standard time for any resident whose health status is deteriorating or who is becoming increasingly more frail (12 months for Classes 2–8, 6 months for Classes 9–12).[17]

No mechanism for review or appeal has been specified for the AN-ACC model.

3.1.3.2 Describe the linking of care bands to service or resource allocation

3.1.3.2.1 Residential care

The Aged Care Funding Instrument specifies four levels of care needs (nil, low, medium, and high) for each of three domains (ADLs, behaviour, and complex healthcare). A basic daily subsidy rate is specified for each of these 12 categories.[28] The subsidy awarded is additive based on the amount awarded for each of the three domains (ADLs plus behaviour plus complex healthcare).[28]

There was no information available on how the amount or value of the resource is determined.

The Aged Care Funding Instrument specifies four levels of care needs (nil, low, medium, and high) for each of three domains (ADLs, behaviour, and complex healthcare). A basic daily subsidy rate is specified for each of these 12 categories (see Table 7). The subsidy awarded is additive based on the amount awarded for each of the three domains (ADLs plus behaviour plus complex healthcare).[28]

Table 7 Daily Aged Care Funding Instrument flat subsidy rates (as at 20 September 2020)

Level	Activities of daily living	Behaviour	Complex healthcare
Nil	AU$0.00	AU$0.00	AU$0.00
Low	AU$38.28	AU$8.75	AU$16.98
Medium	AU$83.36	AU$18.14	AU$48.37
High	AU$115.49	AU$37.81	AU$69.84

Source: Commonwealth of Australia (Department of Health), 2020[25]

Supplements for particular groups are also specified (e.g. those requiring oxygen or enteral feeding, veterans, those who are homeless), as well as subsidies for viability based on the location of the service user according to different schemes. Basic daily subsidy rates are also specified for new residents who have been approved by an Aged Care Assessment Team and are awaiting submission of an application for classification (interim rate), for grandparented residents (eight classification levels), and for residential respite (low and high levels).[25]

Government subsidies are paid directly to the residential care provider.

Subsidies are income-tested and service users may be required to pay a contribution. This contribution is paid fortnightly or monthly and may include the following:

- A basic daily fee, set at a percentage of the single basic age pension. This fee is updated biannually in line with the age pension. All residents are expected to pay a basic daily fee.
- A means-tested care fee. Annual and lifetime caps apply for varying levels of income.
- Accommodation costs, set by the care provider based on the location of the facility and the size of the room, and negotiated with the resident on entry. The resident can pay this charge as a refundable lump sum amount, rental-style daily payments, or a combination of both. Residents are expected to pay accommodation costs, but can receive a means-tested subsidy.

The service user may pay additional fees for extra care and services offered by the care provider, such as preferred brand of toiletries and hairdressing services. Some facilities also have 'extra service' status, providing residents with a higher standard of hotel-type services (e.g. specialised menus or higher-quality furnishings). Residents are responsible for these additional service fees, which may be optional or mandatory, and may be room-specific or apply to the whole facility.[34]

Subsidy reductions apply if the service user is entitled to personal injury compensation that covers some or all of the cost of their residential care. Subsidy reductions also apply for extra service places, certain state and territory providers designated as adjusted subsidy care services, and where a means-tested care fee applies.[27]

3.1.3.2.2 AN-ACC

The AN-ACC assessment tool is used to classify residents into 1 of 13 classes based on care needs. The AN-ACC funding model provides subsidies to home care facilities based in part on the classification of individual residents, alongside fixed care costs and costs associated with a new resident's initial adjustment period.

The cost allocation methodology in *The Resource Utilisation and Classification Study* for the AN-ACC funding model is described in some detail by the model's authors.

First, financial data were gathered from all facilities on categories of expenses (including salaries, care-related consumables and direct care expenses, indirect staff and indirect care-related expenses, facility corporate expenses, and hotel and accommodation expenses), bed activity and occupancy, paid staff hours, and facility profile information.

For each expense category, costs were split between variable costs (related to individual care) or fixed costs (shared and indirect costs). In the next stage, corporate expenses were allocated to direct, indirect, and hotel cost 'buckets', based on reported proportions of total expense. On this basis, three distinct types of cost were identified: individual care, fixed care, and hotel-related costs.

The individual care costs were used to inform the development of AN-ACC classes and their associated relative prices (see discussion below of classes and national weighted activity units). The fixed care costs were used to inform the level of fixed daily subsidies for care facilities.[35]

Government subsidies payable to care providers incorporate three components:

- A daily base care tariff (to cover fixed care costs, which do not change significantly with changes in the care needs of individual residents or small fluctuations in occupancy, paid per resident care day)
- A variable payment (to cover individual resident care costs, based on the resident's AN-ACC class, paid per resident care day), and
- A once-off adjustment payment (a once-off lump sum payment to cover additional costs in the initial adjustment period when a resident enters the care home).

The model uses national weighted activity units to designate a relative price for a given activity. A national weighted activity unit of 1.0 means that the price of the activity is at the national average; a national weighted activity unit of 1.2 means that the price of the activity is 20% above the national average, and so on.

The care home itself is assigned one of six base care tariffs, each with a national weighted activity unit for the purpose of fixed costs, reflecting the facility's size, geographic location, and service specialisation. Individual residents are also assigned a national weighted activity unit based on their AN-ACC class, and a uniform national weighted activity unit applies to all resident classes for the adjustment payment. As funder, the Commonwealth sets the standard national price for a national weighted activity unit value of 1.0.

The total payment is therefore calculated by summing the following three components and multiplying the total by the national weighted activity unit 1.00 price:

- Facility base care tariff national weighted activity unit × bed days
- Sum of (individual resident's class national weighted activity unit × bed days) for all residents, and
- Adjustment national weighted activity unit × number of new residents.[32]

Changes to the current system of supplements based on viability and characteristics of particular groups (e.g. respite, oxygen) have not yet been explored by *The Resource Utilisation and Classification Study*, and recommendations for further research or continuing with the present system have been forwarded by the model's authors in each case.[32]

The Resource Utilisation and Classification Study did not capture data to inform any subsidy reductions, such as compensation and means testing.[32]

The model does not yet specify information about means testing or the mechanism by which subsidies are to be paid to facilities.[32]

3.2 Alberta, Canada

3.2.1 Background

Continuing care services in Alberta cover a range of supports, including home health, community services (e.g. adult day programmes), and residential care, which encompasses designated supportive living and long-term care. Eligibility is based on the professional assessment of a prospective service user's unmet needs for care, irrespective of age, diagnosis, or duration of need for care. Home and personal care services are publicly funded and provided at no cost to eligible service users, while co-payments may apply for home support services (e.g. homemaking assistance). Long-term residential care is publicly funded, and the maximum accommodation charge payable by residents is set by the Alberta Government.

3.2.2 Home support

3.2.2.1 Describe the use of care bands to classify care needs

Access to the continuing care system in Alberta – which encompasses home support, supportive living, long-term residential care, and hospice and end-of-life care – can be initiated by anyone. Service users' care needs are assessed by a case manager using the interRAI Home Care Assessment System (interRAI-HC).[36] Data from this assessment are submitted to the Home Care Reporting System, and on this basis, the Canadian Institute for Health Information produces system-level case mix analyses of home support service provision using the Resource Utilization Groups III Home Care (RUG-III-HC) tool.[37]

Service user's care needs are assessed using interRAI-HC, which covers ADLs functioning, continence, communication/hearing, dental status, depression, disease diagnoses, environment/home safety, falls, health conditions, medication use, instrumental ADLs (IADL) performance, informal support services, mental functions and cognition, mood and behaviour, nutrition/hydration, pain, physical abilities, preventive health measures, reliance on healthcare services, skin condition, social functioning, sociodemographic background, strengths, and vision.[36] Data from this assessment are submitted to the Home Care Reporting System. On this basis, the Canadian Institute for Health Information produces system-level case mix analyses of home support service provision using the 23-group RUG-III-HC tool. On the basis of 74 variables from the interRAI-HC instrument, service users are classified into one of seven clinical categories, each of which contains between two and five further subdivisions or groups.[37,38] See Figure 3 and Figure 4 for more information.

In order of descending resource intensiveness, the seven major clinical categories[39] are:

- Special rehabilitation (three RUGs): Occupational/physical/speech-language therapy required
- Extensive services (three RUGs): High ADLs impairment score; respirator for assistive breathing; all other respiratory treatments; tracheostomy care

- Special care (two RUGs): Stage 3 or 4 pressure ulcers; enteral feeding tube; multiple sclerosis; second- or third-degree burns; radiation therapy; intravenous (IV) infusion (peripheral or central); fever and insufficient fluid, or pneumonia, or vomiting, or unintended weight loss
- Clinically complex (four RUGs): Insufficient fluid; stasis ulcer; end-stage disease; chemotherapy; transfusions; hemiplegia/hemiparesis; urinary tract infections; dialysis; pneumonia; skin conditions
- Impaired cognition (three RUGs): Fewer ADLs impairments; moderate or high Cognitive Performance Scale score
- Behaviour problems (three RUGs): Fewer ADLs impairments; socially inappropriate/disruptive behavioural symptoms occurred – not easily altered; hallucinations, and
- Reduced physical functions (five RUGs): All assessments.

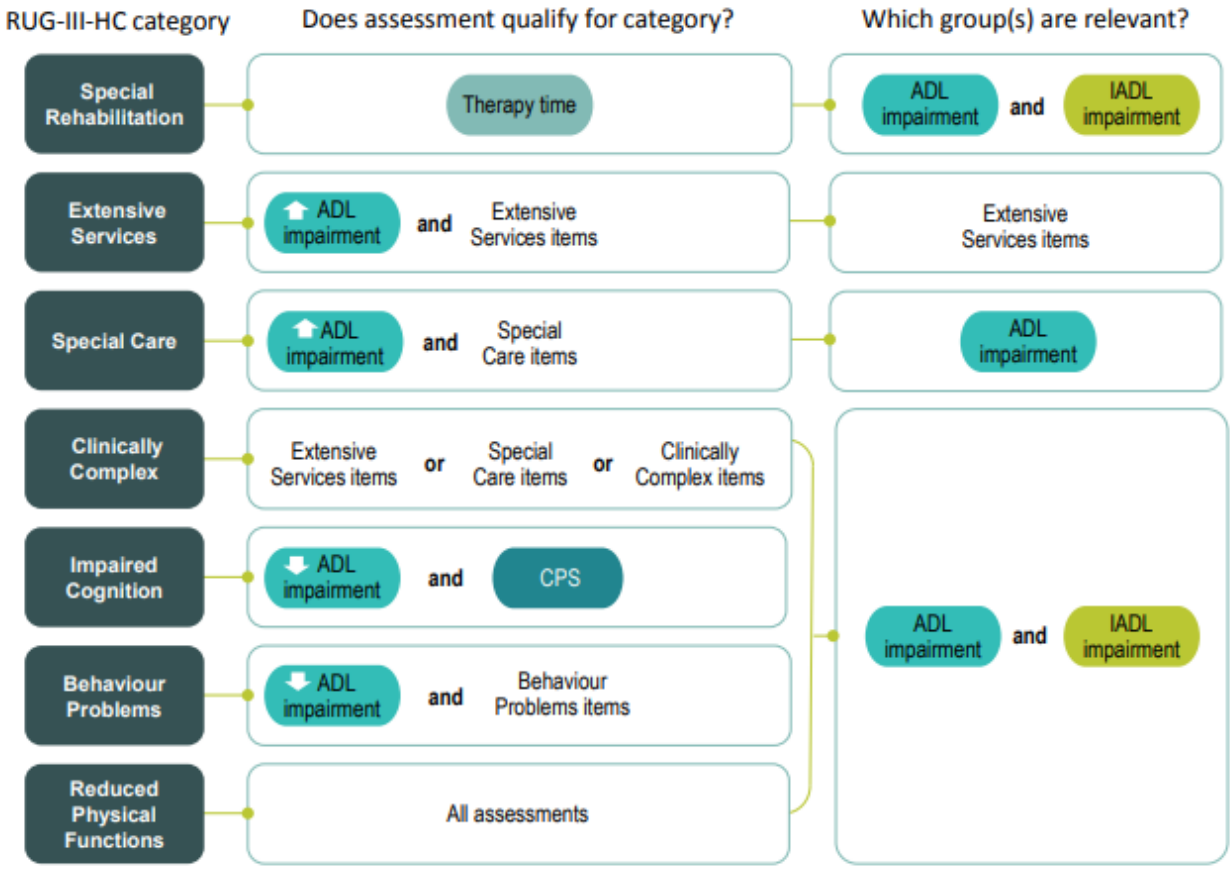

Figure 3 Summary of RUG-III-HC grouping methodology

Source: Canadian Institute for Health Information, 2017[39]

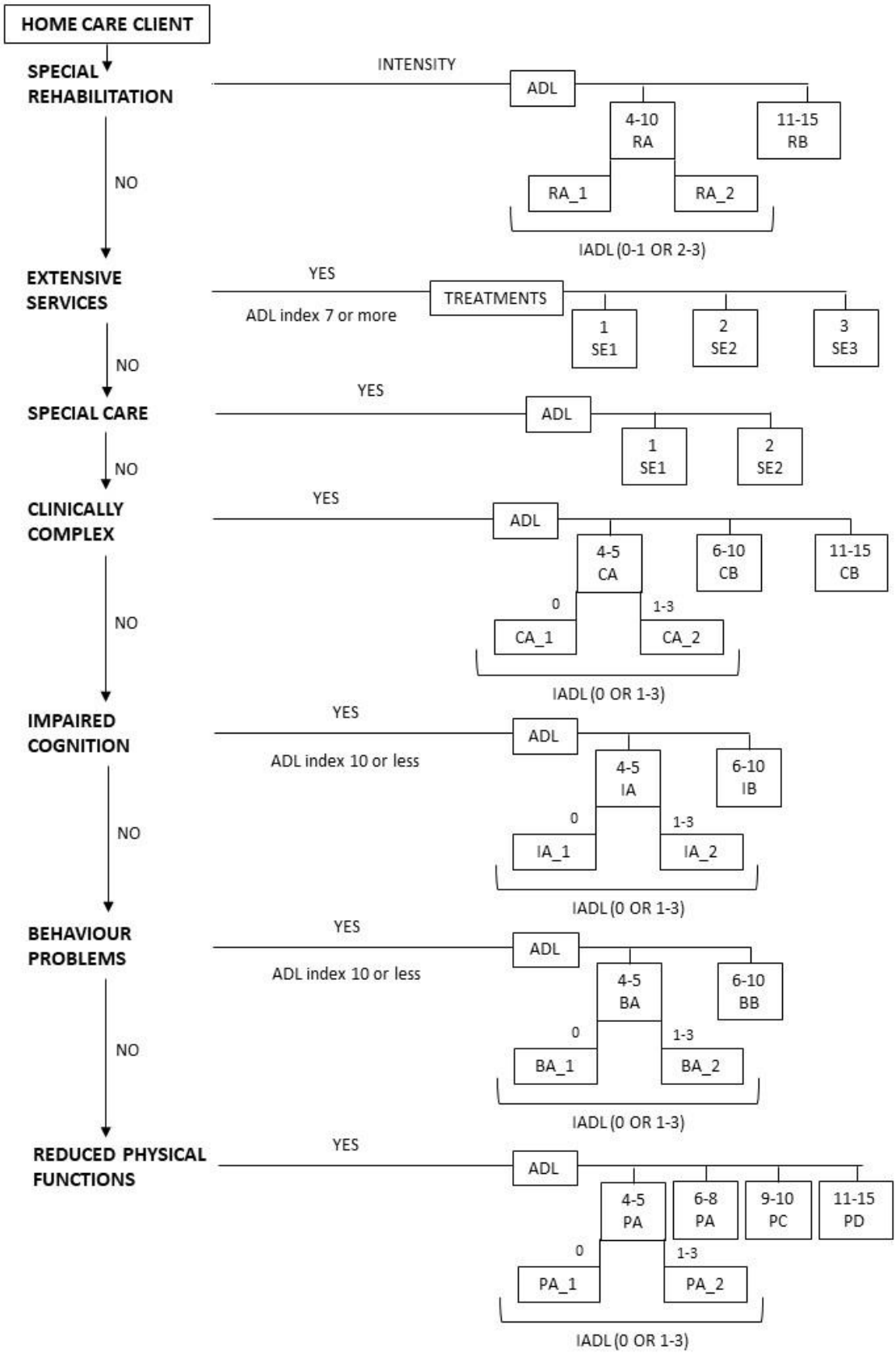

Figure 4 RUG-III-HC 23-group classification

Source: interRAI, 2021[38]

Service users may self-refer for an assessment, which is carried out by a case manager[40] and may be done while the service user is at home or in acute care. The case manager may seek input from family members[36] or other members of the service user's healthcare team, including physicians, physiotherapists, and pharmacists. Case managers may be registered nurses, physical therapists, occupational therapists, or social workers.[36]

Reassessment is completed annually by the case manager when a significant change in health status occurs,[41] or on request from the service user.[42]

No information was available on review of decision and right of appeal.

3.2.2.2 Describe the linking of care bands to service or resource allocation

Although the Canadian Institute for Health Information produces system-level case mix analyses of home support service provision using the RUG-III-HC tool, this information is not used as a basis for resource allocation.

Health and personal home care services provided by Alberta Health Services' Home Care programme are publicly funded at no cost to the service user.[43]

3.2.3 Residential care

3.2.3.1 Describe the use of care bands to classify care needs

Patient/Care-Based Funding (PCBF) was introduced for residential care in 2010 to allocate equitable funding to providers based on the relative needs of residents.[44]

Access to the continuing care system in Alberta – which encompasses home support, supportive living, long-term residential care, and hospice and end-of-life care – can be initiated by anyone. A continuing care case manager will meet with a prospective service user and will perform an assessment using interRAI tools to determine the person's unmet care needs.[45] Resident assessment is carried out using the interRAI Minimum Data Set 2.0. On this basis, the 44-group RUG-III system is used to classify residents according to their care needs, and a case mix index for the provider is calculated based on the RUG-III classifications of all the residents in their care.

Residents' care needs are assessed on admission to a long-term care facility, using the Resident Assessment Instrument Minimum Data Set (RAI-MDS) 2.0. Based on this, the 44-group RUG-III is used to classify residents into 1 of 7 clinical categories, within which are between 3 and 14 further subdivisions, or groups.[46] Within each clinical category, assignment to a group is based on ADLs scores. This score measures assistance needs for mobility (1–5), transfers (1–5), toilet use (1–5), and eating (1–3), giving a total score ranging from 4 to 18. The groups in some clinical categories are further determined by other factors (intensity of need, treatments required, and nursing rehabilitation needs).[47] See

Table 8 for further information.

Table 8 RUG-III 44-group classification

Clinical category	Number of RUGs	ADLs score	Other
Special rehabilitation	14	4–8, 9–15, 16–18	Intensity: Low, medium, high, very high, ultra-high
Extensive services	3		Treatments: 0–1, 2–3, 4–5
Special care	3	7–14, 15–16, 17–18	
Clinically complex	6	4–11, 12–16, 17–18	
Impaired cognition	4	4–5, 6–10	Nursing rehabilitation: 0–1, 2+
Behavioural problems	4	4–5, 6–10	Nursing rehabilitation: 0–1, 2+
Physical function	10	4–5, 6–8, 9–10, 11–15, 16–18	Nursing rehabilitation: 0–1, 2+

Source: Turner-Stokes *et al.*, 2012[47]

More than one group may qualify for any given assessment. The service user's final RUG-III group may be assigned based on a hierarchical approach (the qualifying group with the highest rank in the hierarchy) or an index-maximising approach (the qualifying group with the highest associated case mix index);[37] an index-maximising approach was recommended by the Canadian Institute for Health Information in 2011.[48]

Reassessment for residents of long-term care is completed quarterly, or when a significant change in health status occurs.[49]

No information was available on review of decisions and users' right of appeal.

3.2.3.2 Describe the linking of care bands to service or resource allocation

Residents' care needs are classified using the 44-group RUG-III, in which each group has an associated case mix index, representing the average expected daily cost of care for a resident in that category.[46] Under PCBF, funding amounts for staffing, equipment, and supplies are calculated on the basis of the provider's aggregated case mix index. Accommodation costs and capital expenditure are funded separately.[46,50]

There was no information available on how the amount or value of the resource was determined.

Funding for long-term care from Alberta Health Services is capped, and the PCBF model is used to allocate the budget between providers based on the relative intensity of care needs of their residents.[50] Funding allocation is based on weighted resident days and the provider's case mix index.

There are three components to PCBF: a fixed component (a flat rate paid to providers based on the number of beds each facility operates), a quality component (a small additional pay-for-performance payment if providers meet quality targets), and a variable component based on resident care needs and number of days.[50]

The amount paid for each resident's care is based on the case mix index of the RUG-III group to which they are assigned. The service user's final RUG-III group may be assigned based on a hierarchical approach (the qualifying group with the highest rank in the hierarchy) or an index-maximising approach (the qualifying group with the highest associated case mix index);[37] an index-maximising approach was recommended by the Canadian Institute for Health Information in 2011.[48]

The case mix index associated with each RUG-III category is based on staff time measures and wage rates; it is not a direct measure of actual costs, but is a cost weight that provides a way to account for differential resource utilisation by service users with diverse needs. Case mix indices are produced for each fiscal year using a standard algorithm.[48]

The staff time measure represents the number of minutes provided by each type of healthcare worker to the resident per day. The relative average wage rate for each healthcare worker type is multiplied by the number of minutes of care in order to calculate the salary-weighted minutes for each healthcare worker type. The case mix index is then calculated by dividing the RUG-III category's total salary-weighted minutes by the overall average total salary-weighted minutes.[46]

The RUG-III's case mix index value is used to weight residents' days. The provider's weighted resident days is the sum of all the residents' weighted resident days. The provider's case mix index is then calculated by dividing the provider's weighted resident days by the number of resident days multiplied by 100.[46]

Alberta Health Services provides PCBF and capital budget directly to long-term care providers. The provider's case mix index from the third quarter of the fiscal year determines the next fiscal year's allocation of long-term care funding.[46]

The service user is responsible for the cost of accommodation in long-term care, as well as additional care or support services that are not included in the care plan developed by the case manager.[51] Accommodation charges include rooms, meals, housekeeping, and building maintenance. Maximum charges for long-term care are set by the Alberta Government.[52]

Accommodation costs may be fully or partly covered for residents who are eligible for the Alberta Seniors Benefit. Recipients of this benefit must be Canadian citizens and Alberta residents, aged over 65 years, and in receipt of the Old Age Security pension from the Government of Canada, and must meet financial eligibility criteria. The Supplementary Accommodation Benefit is also available for senior residents of long-term care with low incomes who are not eligible for the federal Old Age Security pension. The amount received is determined by the resident's income, the maximum monthly accommodation charge, and the monthly disposable income amount (to be used for personal expenses, e.g. personal hygiene, telephone, cable, etc.).[53]

3.3 Germany

3.3.1 Background

The German healthcare system has undergone substantial changes in recent years, including changes to the long-term care system. The existing care band system has been updated in tandem with the updates to the overall system in order to reflect the growth in population and the needs of this population. Both home support and residential care are covered. As well as developing the home support system, support is also offered in residential and semi-residential facilities (such as day care). The system favours remaining in the home over institutional care, and endeavours to allow individuals to 'age in place' for as long as possible.

Prior to 1994, long-term care was financed by individual German states (*Länder*) and local government without federal input, which proved onerous. The Long-term Care Insurance Act was passed in 1994 and implemented in 1995 in order to provide statutory social assistance for citizens requiring long-term care, with assessment of their need for care.[54] After 1995, the Long-term Care Insurance (*Pflegeversicherung*) system was introduced.

In the earlier system, three levels of disability (*Pflegestufen*) were used to cap the amounts payable for care – Care Level 1: substantial, Care Level 2: severe, and Care Level 3: very severe. A further category of Hardship was considered for individuals who needed two or more caregivers simultaneously overnight, or where at least 7 hours of assistance for ADLs were required, 2 hours of which must be at night.[55] The time involved in caring for the individual had to be at least 90 minutes (at least 45 of which were spent on basic activities) for Care Level 1, at least 3 hours (at least 2 hours of which were spent on basic activities) for Care Level 2, and at least 5 hours (at least 4 hours of which were spent on basic activities) for Care Level 3.[56]

Benefit was administered regardless of the availability of family caregivers. Institutional status also affected the entitlements of applicants – the value of the amounts payable varied depending on whether home care, institutional care, or partial day/night care was required. If care outside of an

institution was given, recipients could elect to receive cash benefits (unrestricted by the provider) rather than receive services paid from a sickness fund. The actual value of the cash benefits was much lower than the sickness fund service benefit, but uptake was greater. Visits to recipients of cash benefits were conducted every 4–6 months in order to ensure that the care levels received were adequate.[55] The system recognised that younger people needed care benefits as well as older citizens; however, the system had not been designed with younger institutionalised people in mind, and benefits to this group were low. Evans Cueller and Wiener state that one examination of sickness fund data in 1996 showed that the assistance available did not cover the costs for 43% of recipients.[55]

Evans Cueller and Wiener note that the ease with which people could see what benefits could be expected for each category of disability was considered an advantage, but that the rigidity of the nationally applied system did not allow for variation in the services available in different locations or to applicants within the same level of disability.[55] The equity of using cash benefits must also be considered against the reduction in efficiency of that system.

The Nursing Development Act (*Pflege-Weiterentwicklungsgesetz*) was implemented in 2008, followed by the three Care Support Acts – *Erstes Pflegestärkungsgesetz*, or PSG I (2014); *Zweites Pflegestärkungsgesetz*, or PSG II (2015); and *Drittes Pflegestärkungsgesetz*, or PSG III (2016) – to improve the situation of German people requiring care.[57-59] The Acts are published and available in German.

The First Act (PSG I) increased long-term care insurance benefits from 1 January 2015, including for inpatient care, outpatient care, preventive care, short-term care, care allowances, surcharges for outpatient residential groups, day/night care for people with dementia, and for other types of care.[57]

The Second Act (PSG II) introduced a new assessment system and a new definition of care needs. The new assessment system uses five levels of need (*Pflegegrade*) instead of the previously used three (*Pflegestufen*).[58,60] According to the Federal Ministry of Health , the assessment of need is currently based on the individual's level of independence and need for care, rather than the duration for which nursing care would be needed and the specific tasks involved. Assessment of care level is made according to the time required for certain caring activities, examined in six aspects: mobility, ability to communicate, psychological problems, self-care, ability to cope with tasks stemming from sickness and disability, and ability to structure daily routines.[61] For example, in the previous system, the time involved in caring for the individual had to be at least 90 minutes (at least 45 of which were spent on basic activities) for Care Level 1, at least 3 hours (at least 2 hours of which were spent on basic activities) for Care Level 2, and at least 5 hours (at least 4 hours of which were spent on basic activities) for Care Level 3.[56] Assessment now incorporates mental health, physical independence, and cognitive abilities. PSG II included dementia as a condition entitling citizens to receive insurance benefits.[62]

Following the enactment of the PSG II in 2016, the five-care-band system (*Pflegegrade*) is used to assess all applicants to the long-term care system for both home care and residential care, and also for those who do not as yet require personal care but for whom some assistance towards remaining healthy (home adjustments, counselling, and other lower-level care) will allow them to remain well and continue living at home. The care bands are associated with different levels of care allowances in cash (*Pflegegeld*) or services (*Pflegesachleistungen*) to meet some or all of the expected costs of the care needs.

Nadash *et al.* have outlined how the old system of three levels of care maps to the new system involving five levels. Care Level 0 in the old system (requiring no assistance with ADLs) maps to Care Level 1 of the current system. Care Level 2 of the old system (requiring assistance at least three times a day with at least two basic activities of daily living and at least some assistance with IADL several times a week, including 2 hours of basic care) equates to Care Level 3 of the current system. Nadash *et al.* also state that efforts were made to ensure that recipients did not lose benefits when their care levels were changed to the new system.[54]

As noted in the *Information on care needs assessments* document by the *Medizinischer Dienst der Krankenversicherung* (or MDK), the legal base for the assessment process is found in Sections 14, 15, and 18 of the German Social Code (*Sozialgesetzbuch* (SGB) XI), Sections 60-67 of the SGB I, and also in

the care needs assessment guidelines of the *gesetzlichen Krankenversicherung* (GKV)-Spitzenverband (the National Association of Statutory Health Insurance Funds) which is the primary body in Germany for providers of statutory health insurance according to the SGB XI.[61,63]

Eligibility for care assistance under the long-term care insurance system is based on need (on the level of impact on independence that an individual is experiencing) rather than age or income cut-offs. While all age groups are covered under the long-term care insurance system, it is primarily used by older age groups. Nadash et al. noted in 2018 that 55% of those who qualified for inclusion were 80 years and older, 28% were aged 65-80 years and 17% were under 60 years of age.[54]

3.3.2 Describe the use of care bands to classify care needs

3.3.2.1 Are care bands used to classify the assessed care needs of prospective users of home support services or residential care, or both?

Care bands are graded on levels of physical, mental, and psychological ability and dependence, from Care Level 1, the lowest level of care for individuals with minimal impairment, to Care Level 5, the highest level. Care Level 1 is designed for individuals who do not yet need significant care, and gives a limited level of funding towards services and/or goods that will allow the individual to remain in their own home in good health. Care Levels 2–5 are intended to assist with more intense care needs and are available to both residential and home-based applicants. For home care, applicants can choose whether to receive services from approved service providers, or to receive nursing allowances as a payment. Home care services available under the long-term care insurance system include physical care (e.g. personal hygiene, mobility assistance, nutrition), care-related assistance measures (e.g. assistance with activities of daily living, with maintaining social contacts or with orientation issues), home nursing (including changes of dressings and administration of medication and injections), advice for the individual and their family, on aspects of nursing care or assistance in negotiating support systems (e.g. delivery of food, arranging patient transports), and assistance with household duties (e.g. cooking, cleaning). [64] Home care can be supplemented by night or day semi-residential services or full-time short-term residential care. All five levels of care are available to residential patients. A co-payment may be payable where the grants do not cover the full cost of residential care, and this can differ between residential establishments. Three types of care homes are covered: residential homes for the elderly, care homes for the elderly, and nursing homes.[64] Further information on these care levels is outlined in Section 3.3.2.2.

3.3.2.1.1 Usage

The percentages of recipients of social insurance at each care level for residential patients and outpatients in 2019 are outlined in Table 9.[65]

Table 9 Percentages of recipients of social insurance among outpatients and residential care patients in 2019

	Care level					
Type of patient	**1**	**2**	**3**	**4**	**5**	**Total**
Outpatient	14.1%	46.5%	26.5%	9.4%	3.4%	~100%
Residential	0.5%	23.3%	33.7%	28.0%	14.5%	~100%

The percentages of recipients of private insurance at each care level for residential patients and outpatients in 2019 are given in

Table 10.[65]

Table 10 Percentages of recipients of private insurance among outpatients and residential care patients in 2019

	Care level					
Type of patient	1	2	3	4	5	Total
Outpatient	7.1%	41.6%	32.9%	13.7%	4.5%	~100%
Residential	1.0%	16.0%	31.9%	33.5%	17.6%	~100%

The type of coverage differs between home and residential care. For example, in the case of home care, funding is available via allowances to pay for informal care, which can include payments to family members, or for nursing services paid as a benefit in kind. These can be combined as the recipient prefers. However, as Doetter and Schmid note, long-term care insurance does not cover the cost of room and board for residential care and only certain amounts of care costs are covered. The benefit in kind allowance is more generous for residential patients. Extra allowances are given in difficult situations, such as end-of-life care.[66]

3.3.2.2 What care bands are used? (To include definitions, number of bands, and who classifies the care bands.)

The five levels of care (*Pflegegrade*) currently used in the German long-term care system are assigned as follows:

- Care Level 1: few limitations on independence or skills
- Care Level 2: significant limitations on independence or skills
- Care Level 3: severe limitations on independence or skills
- Care Level 4: extremely severe limitations on independence or skills, and
- Care Level 5: extremely severe limitations on independence or skills with special demands on care provision.

These care levels are based on a nursing care-appropriate assessment of the individual's abilities and reductions in independence and can include physical, mental, or psychological impairment. An exception can be made within the system for people with specific care needs, who can be classified as requiring level 5 care even where the points-based assessment does not reach the cut-off for Care Level 5.[64]

To request services, applicants must have paid into the long-term care insurance fund for at least 2 years within the last 10 years, or else must have been insured via family insurance. After an application for care assessment is received, an appointment with the applicant will be made within 2 weeks. The applicant may receive advice from a care advisor from the long-term care fund, or may receive a voucher to receive advice from an independent advisor.[64]

3.3.2.3 How is mobility between care bands enabled, ensuring responsiveness to service users' changing care needs (e.g. moving to more or less intensive care)?

No description was found in the English-language literature to describe the mechanisms by which individuals could move between care levels, but it seems feasible that a reapplication using the same application and assessment system is possible.

3.3.2.4 How are decisions on the care banding of service users reviewed, and what mechanisms are in place to enable service users to appeal decisions made in relation to their care band allocation?

3.3.2.4.1 Assessment by health insurance evaluators

The Medical Service of German Statutory Health Insurance providers (*Medizinischer Dienst der Krankenversicherung*; MDK)), on behalf of the Federal Ministry of Health, is the assessor for care levels for subjects with Statutory Health Insurance.[61] Subjects with private health insurance are assessed by MEDICPROOF. Figures released by the Federal Ministry of Health show that, as of December 2019, statutory insurance covers approximately 73.05 million individuals, while private insurance covers approximately 9.22 million individuals.[65]

Assessments of independence and care need are carried out in the home or residential care setting. The person with care needs is recommended to have a trusted person with them during the assessments. Care needs are assessed using six modules:

- Module 1: Mobility
- Module 2: Cognitive and communicative abilities
- Module 3: Behaviour and psychological problems
- Module 4: Self-care
- Module 5: Coping and dealing independently with illness and treatment-related demands and stresses, and
- Module 6: Planning day-to-day living and maintaining social contact.

Each of the six modules contains several categories or criteria. An individual's needs are scored on these categories depending on level of need. The 'mobility' module includes 5 criteria, the 'cognitive and communicative abilities' module includes 11 criteria, the 'behaviour and psychological problems' module includes 13 criteria, the 'self-care' module includes 13 criteria, the 'coping and dealing independently with illness and treatment-related demands and stresses' module includes 16 criteria, and the 'planning day-to-day living and maintaining social contact' module includes 6 criteria.[67]

Point scores for each module are added and weighted and weights are given in Table 11.[61] The full checklist for assessment can be found in German in Section 6 of the document *Richtlinien des GKV-Spitzenverbandes zur Feststellung der Pflegebedürftigkeit nach dem XI. Buch des Sozialgesetzbuches.*[68]

Table 11 Numbers of assessment categories and percentage weightings for each assessment module

Module	Number of categories per module	Point weightings for each module
Mobility	5	10%
Cognitive and communicative abilities	11	15%
Behaviour and psychological problems	13	15%
Self-care	13	40%
Coping and dealing independently with illness and treatment-related demands and stresses	16	20%
Planning day-to-day living and maintaining social contact	6	15%

The points required for access to each care grade are given in Table 12.[64]

Table 12 Point score ranges for each care grade

Care grade	Points range
Grade 1	12.5–<27
Grade 2	27–<47.5
Grade 3	47.5–<70
Grade 4	70–<90
Grade 5	90–100

After the assessments of need, an assessment report (including care and equipment requirements) is sent to the insurance provider, which reports the recommendations, MDK report, and care level decision back to the person in need. Decisions must be communicated within 25 working days of an application, and for applicants in hospital or residential care who need a rapid response in order to continue receiving care, decisions can be given within a week. Appeals can be lodged within 1 month of receiving the decision.[64]

The options available to applicants are wide-ranging, so in order to assist with negotiating the system, the MDK (or other insurer) provides care counselling to match the needs of the applicant (and their carers) with the most appropriate level of care for them. The counsellors offer free advice on benefits and assist with documentation preparation, with access to records, and with creating and initiating a care plan for the applicant. The counsellor can suggest changes to the plan if changes in the applicant's situation or needs occur.[64] The care provided can consist of home care, semi-residential care, or residential care.

3.3.2.4.2 Appeals

An applicant may appeal a decision on an application for long-term care within a month of receiving the decision.[61] The application may be rejected on technical or material details, or the applicant may disagree with the level of care assigned to them. The individual may re-apply with a new application to be assessed for a change in care level.

The Federal Ministry of Health publishes statistics on the usage of the long-term care system on its website.[65] Since 1995, the Federal Ministry of Health is required to produce care reports every 4 years (or every 5 years, in the case of the fifth report due to changes in the system) outlining the progress and status of the system. These are published in German on the website of the Federal Ministry of Health.[69]

Auditors of the MDK (and the private health insurers) examine the documents supplied and also how the care is administered – whether there are deficits in the care provided, whether the care has an effect, and whether the patients are satisfied with the provided care. Residential and home care services are audited annually and the quality inspection results are provided in an accessible form. Audits of care claims are also carried out.[64]

3.3.3 Describe the linking of care bands to service or resource allocation

Each care band is linked to allowances for several types of care, from a general care allowance, to preventive care, inpatient care, day care, and night care. Each band is also allowed a different amount for support/relief care, and products needed for care. Information for benefit entitlements per band in Table 13 are taken from the *Long-term care guide: everything you need to know about long-term care* by the Federal Ministry of Health, dated 2020.[64]

Table 13 Allowance entitlements for insured people

Setting	Entitlement	Care levels 1	2	3	4	5
Home care	*Nursing allowance of € per month*	-	€316	€545	€728	€901
	Long-term care benefits in kind of up to € per month	-	€689	€1,298	€1,612	€1,995
Stand-in care by close relatives	*Care requirement of up to 6 weeks per calendar year of up to € per year*	-	€474 (1.5 times €316)	€817.50 (1.5 times €545)	€1,092 (1.5 times €728)	€1,351.50 (1.5 times €901)
By other persons		-	€1,612	€1,612	€1,612	€1,612
Short-term care	*Care requirement of up to 8 weeks per calendar year of up to € per year*	-	€1,612	€1,612	€1,612	€1,612
Semi-residential day and night care	*Care requirement of up to € per month*	-	€689	€1,298	€1,612	€1,995
Relief amount for non-residential care	*Benefit amount of up to € per month*	€125	€125	€125	€125	€125
Additional benefits in group homes with non-residential care	*€ per month*	€214	€214	€214	€214	€214
Fully residential care	*Care requirement of a fixed amount of € per month*	€125	€770	€1,262	€1,775	€2,005
Care in fully residential facilities for disabled people	*Care requirements in the amount of*	-	10% of the nursing home pay, up to €266 per month			
Consumable nursing supplies	*Requirements of up to € per month*	€40	€40	€40	€40	€40
Technical aids and other consumable nursing supplies	*Requirement per aid in the amount of*	-	100% of costs; however, in certain circumstances, a co-payment of 10% (no more than €25 per nursing supply item) must be made. Technical nursing supplies are mostly made available on loan, i.e. free of charge.			
Measures to improve the living environment	*Requirements in the amount of up to*	-	€4,000 per measure (up to four times this amount – i.e. a total of €16,000 – when several entitled individuals live together)			
Payment of pension insurance contributions for caregivers	*Depending on type of benefit up to € per month (acceding territory)*	-	€156.44 (€144.13)	€249.14 (€229.54)	€405.57 (€373.67)	€579.39 (€533.82)
Payment of unemployment insurance contributions for caregivers	*€ per month (acceding territory)*	-	€38.94 (€35.88)	€38.94 (€35.88)	€38.94 (€35.88)	€38.94 (€35.88)
Health and long-term care insurance subsidies for caregivers during caregiver leave	*Up to € per month. Health insurance*	€160.94	€160.94	€160.94	€160.94	€160.94
	Long-term care insurance	€31.67	€31.67	€31.67	€31.67	€31.67

Setting	Entitlement	Care levels 1	2	3	4	5
Caregiver allowance (gross) for employees during short-term absence from work	*Up to 10 working days*	90% (100% if in receipt of one-off payments subject to contributions in the last 12 calendar months prior to taking time off work, regardless of amount) of the net loss of earnings				

If home care is appropriate, the applicant can choose to receive nursing care from an approved service provider, or to receive a nursing allowance as a monetary benefit. It is required that care services are approved by the insurance funds before these services can be engaged. If an amount of the allowance remains unspent after the services are paid for, the remainder can also be converted to engage services to assist with daily living, up to a limit of 40%. Nursing allowances may be used to pay family or friends carrying out the caring services, where the care recipient is receiving at least a Care Grade 2 or Care Level 2 allowance. Where both the nursing allowance and professional home care services allowance are given, the amount of the nursing allowance is decreased.[64]

A preventive healthcare approach has been implemented with the change in care bands, and it is suggested in the European Commission's *Peer Review on "Germany's latest reforms of the long-term care system" – Synthesis Report* that the addition of Care Level 1 will allow an additional half a million people access support, advice, home adaptations, and counselling before they require more serious and more costly assistance.[67] All care levels can now avail of €125 per month for personal support. An emphasis has been put on the local role in the system, with support structures and advisory services set up by municipalities, which will network and coordinate services in their areas.

Considerable work has been done on developing the assessment process for care levels. In 2009, the Advisory Board for the Review of the Definition of the Need for Long-term Care presented a final report on the basis for new definitions of long-term care needs and new assessment tools for calculating need levels.[70] This new system moved away from assigning the amount of resource to the amount of time necessary to meet the individual's care needs.

The amount allowed for each type of available care for each band is set based on degree of need (rather than time spent with the carer). Allowances are assigned on the principles of degree of independence, resource orientation, comprehensive consideration of the care need, and the five care levels, and it is irrelevant whether the care activity in question actually occurs.[56]

The long-term care insurance system was introduced in 1995 as a compulsory system with three levels, as described in Section 3.3.2.[64] The changes brought about by the Care Support Acts (PSG I, PSG II, and PSG III) updated this system.

Nadash *et al.* note that the population of older people in Germany is expected to rise from 16% in 1995 up to 32% (or almost 32 million) in 2050, of which 4.5 million are expected to be entitled to long-term care insurance.[54]

The social long-term care insurance system in Germany was designed to be self-financing.[54] This system is administered by the Long Term Care Insurance Funds, which were created as part of the Sickness Funds of the social health insurance system.[71] Bahnsen *et al.* state that the sources of funding for the system are contributions on labour and pensions (€31.96 billion in 2016), working assets (€9.34 billion in 2016), and the long-term care capital reserve fund (€2.44 billion in 2016).[72]

It is noted in *Long-term care guide: everything you need to know about long-term care* by the Federal Ministry of Health[64] that a provident fund was set up by the Bundesbank, under the terms of the first of the care support acts (*Erstes Pflegestärkungsgesetz* or PSG I), to counter the financial effects of an ageing population and falling birth rate. Each year, investments amounting to 0.1 percentage points of the contributions to the long-term care insurance system are added to the fund, which stood at €1.4 billion per year at the time the guide was published in 2020,[64] and it is expected that over a period of 20 years, this fund will be sufficient to cover the expected high number of people with care needs and associated funding deficits.

The majority of citizens are covered by social insurance, while a small minority require private insurance to cover their needs. Private insurance is paid by a minority of German citizens – approximately 11%, according to the Federal Ministry of Health.[64] The private insurance system complements the social insurance system, but is not covered in this review. The long-term care insurance system is intended to cover basic needs and can be thought of as partial cost insurance, as complete cover would necessitate a higher rate of contribution than is currently required.[64]

In Germany, social contributions are paid by employer and employee, divided equally. Premiums had been previously set at 1.7% in 1994. Implementation of the PSG II increased the contribution rate from the participants by 0.2 percentage points in 2017, and the rate increased by an additional 0.2 percentage points in 2019.[56] For the most part, citizens pay a premium of 3% to the statutory insurance scheme, of which half is paid by the employer. The Federal Ministry of Health's *Long-term care guide: everything you need to know about long-term care* states that the contribution payment has been 3.05% since 2017, or 3.3% for childless people.[64] Childless adults (aged 23–64 years) pay a surcharge of 0.25 percentage points on top of the general rate, and there has been much discussion in the press as to whether this surcharge should be increased in order to help with expected deficits once the 'baby boomer' generation retires.

Bahnsen *et al*. note that the system was intended to provide only partially comprehensive coverage, with costs divided between the social insurance system and the recipients and, in some cases, the taxpayer.[72] The payment of allowances to applicants is via a flat rate, which is based only on care need rather than on a means-adjusted system. Bahnsen *et al*. note that the change in the system from 2016 to 2017 was associated with the highest ever deficit recorded by the long-term care insurance system of €2.44 billion.[72]

From 31 December 2016, reclassification was carried out in order to facilitate the change to the new system, which increased an individual's care level by one or two levels to fit with the new system, taking into account the individual's condition. Bahnsen *et al*. give the example of a person on the old Care Level 1 being reclassified to Care Level 2, where if dementia or other need for extra care was present, a reclassification to Care Level 3 was facilitated.[72] After 2017, a higher proportion of applicants were assigned to the higher grades. However, the system may move to a more 'expenditure-reducing steady state' by adjusting the assessment process to a less generous benefit level, as happened after the previous system change in 1995.[72]

It is noted in the 2018 European Commission *Peer Review on "Germany's latest reforms of the long-term care system" – Synthesis Report* that, in tandem with the changes to the long-term care insurance system, the whole caring system was enhanced under the Care Support Acts, with investment in staff, residential, and support structures.[67] As family carers carry the majority of the workload, pension and insurance contributions for carers working more than 10 hours a week were secured. This report states that contributions to the long-term care insurance system are expected to rise, and that an additional €5 billion has been made available from 2017. It is also noted that, in 2017, 3.3 million people were supported by long-term care insurance and approximately 73% of these people received home care, of which two-thirds received care from informal carers, including family.

3.4 New Zealand

3.4.1 Background

In New Zealand, long-term residential care and home care are funded by the district health boards based on a patient needs assessment, age, and means-testing. Services are funded for those aged over 65 years and those "close in age and interest" (e.g. people with early-onset dementia or a severe age-related physical disability).[73]

Each district health board funds, and in most cases provides, a Needs Assessment and Service Coordination (NASC) unit, which operates the needs assessment and service coordination process on behalf of the district health board. People can self-refer to a NASC unit, or be referred by their family,

carer, general practitioner (GP), or the hospital.[74] Based on the assessment, people can then be put forward for home or residential care.

3.4.1.1 Care for younger adults

For individuals under 65 years of age, Home and Community Support Services funded by the Ministry of Health are available.[75] They can help with both household management and personal care. Household management includes tasks such as preparing meals, washing, drying or folding clothes, house-cleaning, vacuuming and tidying up, while personal care may include help with eating and drinking, getting dressed and undressed, getting up in the morning and getting ready for bed, showering and going to the toilet and getting around the home.

In order to be eligible for these services, one must be aged under 65, meet the Disability Support Services' eligibility requirements,[76]and have been assessed by an NASC unit as requiring home-based support services. Further, household management is only available to people who have a Community Services Card and children under the age of 16 years whose parents or caregivers have a Community Services Card.[75]

For eligible individuals, the NASC will agree a care plan with a relevant support package. These support packages refer to the funding or range of disability support services allocated to a disabled client to address their disability support needs. Support package allocations are categorised by five levels, from 'very low' to 'very high'.[77] According to the response to an information request made under the Official Information Act 1982 to the Ministry of Health in New Zealand in 2019, support package allocations are determined through the use of the Service Package Allocation (SPA) tool.[78] There are three separate tools, one for each age group:

- Birth to 5 years
- 5 years to school-leavers
- School-leavers and adults

These tools assess the disability support level required for each individual and the natural and community supports available to them at the time. The support package allocation is defined by the disability support level required, less the natural and community supports available. Set levels of funding are available for each support package.[78] The HRB was unable to find any further information on these care bands; therefore, this system is not discussed in any further depth in this report. The following sections report on the systems in place for home support and residential care for older adults only.

3.4.2 Home support

In 2002, New Zealand established a policy directive, Ageing in Place, that aims to support older people to feel safe and secure in their choice of home, with a focus on enabling people to remain living at home instead of entering residential care. Under the Ageing in Place policy, New Zealand district health boards contract for support services to be provided to older people in their own homes based on their level of need. These services are collectively referred to as home-based support services or home care and include a range of housework and personal care services.[79]

Older people with long-term support needs lasting longer than 6 months are categorised as 'non-complex' or 'complex' using a filter based on screening of client cognitive ability, mobility, and social support circumstances by the NASC unit.[80] Those with non-complex needs are subsequently assessed by a health professional NASC Clinical Assessor in the person's own home using the interRAI Contact Assessment (interRAI-CA).[81] The interRAI-CA consists of 24 detailed questions concerning mobility, cognitive ability, and health status and takes between 30 and 60 minutes to complete. Those older people determined to have complex needs are assessed using a more comprehensive instrument, the interRAI Home Care Assessment System (interRAI-HC), with more than 100 detailed questions, again undertaken in the person's home, often alongside the primary informal carer, and taking between 90 and 120 minutes to complete.[82]

The Ministry of Health defines an eligible older person as "someone who has been identified as having an age-related disability which is likely to continue for a minimum of six months and result in a reduction of independent function to the extent that ongoing support is required."[83], The NASC can advise on an individual's eligibility for funded services and whether they qualify for these services. If an individual is not eligible for funded services, the NASC can advise on agencies in the area that are able to provide the necessary services, at the individual's own cost.[84]

3.4.2.1 Describe the use of care bands to classify care needs

According to the National Framework for Home and Community Support Services (HCSS), a nationally consistent case mix methodology has been developed for all district health boards to use as a way of improving targeting of resources according to need. Some district health boards were already applying case mix methods to resource allocation or use. However, different versions of the methodology were being used, resulting in some inconsistency in resource allocation and a lack of transparency across New Zealand. It has been mandated that a single, nationally consistent case mix method would be implemented across all district health boards by July 2022.[85] This national rollout is now complete. (Parsons, M. Professor of Gerontology. Personal communication. 26 Mar 2021) The new method, developed by Parsons *et al.,* will be presented in the following sections.[80]

Two models of case mix classification systems have been developed for the home care sector: one for older people with non-complex needs and the other for older people with complex needs.

3.4.2.1.1 Non-complex needs

The model developed by Parsons *et al*. comprises three lead categories:[80]

1. Housework only
2. Shopping/housework, and
3. Personal care/housework/shopping.

Further statistical analysis and clinical insight during the development of this model led to additional delineation of older people with non-complex needs. Older people assessed as having 'unstable conditions' or an 'urgent need for physiotherapy or occupational therapy' were assigned a 'flexible' subcategory; those older people not assessed with these needs were classified as 'stable'. Thus, older people with non-complex needs can be assigned to one of six care categories, as per

Table 14.

Table 14 Description of case mix system for older people with non-complex needs

Category number	Category name	Description
1a	Housework only (stable)	Clients with low-level ADLs difficulty requiring support with housework every week or every two weeks.
1b	Care management (flexible)	Oversight of client by health professional coordinator from home care services (client may not have formal hours assigned).
2a	Housework and shopping (stable)	Clients who are designated as having difficulty with undertaking their own grocery shopping (a higher level of disability than category 1b). Shopping entails transport to and from shops; choosing, purchasing, and carrying shopping; and unpacking at the client's home.
2b	Housework and shopping (flexible)	Dependency level as with category 2a, although client would have had a recent acute event and therefore potential for recovery and return to independence is much better.
3a	Personal care (stable)	Clients within this category experience difficulties with washing themselves (either showering or bathing) and require regular weekly input across multiple days to support this activity.
3b	Personal care (flexible)	As with category 3a, but in addition, the client's condition is unstable and their weekly inputs may vary according to their condition, and close monitoring is required.

Source: Modified from Parsons *et al.,* 2018[80]

3.4.2.1.2 Complex needs

The model developed by Parsons *et al*. comprises eight lead categories, as described in

Table 15.[80] However, as with the model for non-complex needs, clients are further delineated by 'brittle social support' (defined as the carer reporting significant burden and stress), 'cognitive impairment' (defined as difficulty with daily decision-making), and 'significant rehabilitation' (defined as potential for recovery), as well as an iteration of 'brittle social support and cognitive impairment'. The 'significant rehabilitation' category is a standalone category, as the expert clinicians regard the intensive rehabilitation pathway as independent from further breakdown by disability, as the trigger for this category is potential for improvement with rehabilitation. Although this results in 33 categories, the commonality of the eight-category disability groups reduces the complexity of this algorithm.[80]

Table 15 Description of case mix system for older people with complex needs

Identifier	Category number	Category name	Description
Low needs	1	Low needs	Almost no help required with lower body and bathing.
	2	Bathing support	Almost no help required with lower body, meal preparation, or medication management, but help required with bathing.
Moderate needs	3	Bathing and cognitive processes	Almost no help required with lower body or meal preparation, but help required with medication management and bathing.
	4	Meal and bathing support	Almost no help required with lower body, but help required with meal preparation, bathing, and slight urinary incontinence.
	5	Meal preparation, bathing support and incontinence	Almost no help required with lower body, but help required with meal preparation, bathing, and urinary incontinence.
High needs	6	Dressing lower body support	Help required with lower body dressing, upper body dressing support, and moderate urinary incontinence.
	7	Dressing lower body support and incontinence	Help required with lower body dressing, upper body dressing support, and major urinary incontinence.
	8	Significant disability	Help required with lower body dressing and upper body dressing.

Source: Modified from Parsons *et al.,* 2018[80]

The HRB did not find any data on mobility between care bands or methods for appealing a classification.

3.4.2.2 Describe the linking of care bands to service or resource allocation

The two models of home care developed by Parsons *et al*. classify people's care needs and the type of service or care required per care category for those with non-complex and complex care needs.[80]

3.4.2.2.1 Non-complex needs

According to Parsons *et al.*, the tool enables home care service coordinators to readily allocate clients to care categories following assessment. The tool provides broad guidelines as to service provision and service aims. Such an approach enables allocation of resources commensurate with the respective case mix group.[80]

Table 16 describes the type of services, inputs, and focus associated with each care category.

Table 16 Operation of the case mix system for non-complex needs

Lead	Description	Subgroup	Descriptor	Inputs	Focus
Housework only (1)	**Supervision/Assistance/Set-up help required with 'Housework'** - includes doing dishes, dusting, making beds, tidying up, laundry **Note.** Multiple district health boards have discontinued supporting this service	**A**	Housework only (Stable)	? Discontinue	Re-integration into community
		B	Care management (Flexible)	Oversight from health professional for home care services	Close involvement with primary care
Shopping and Housework (2)	**Supervision/Assistance with**: (i) **stairs** (how a full flight of 12-14 stairs is managed; OR (ii) **mobility** (moving around on one level); OR (iii) **preparing meals** (planning, assembling, cooking, setting out); OR **weekly grocery shopping** (compiling lists, transport, purchasing, storage)	**A**	Housework and shopping (Stable)	Low weekly input, annual reviews by health professionals coordinator	Cost effective delivery whilst identifying changing needs
		B	Housework and shopping (Flexible)	Graduated reduction in home care hours over time, 3/12 reviews by health professionals coordinator	Maximising independence; discharge or reduce visits
Personal care and Shopping and Housework (3)	**Supervision/Assistance with showering/bathing** - full shower/bath including transfers in/out bath/shower. Includes combing hair, brushing teeth, applying make-up, washing and drying face and hands	**A**	Personal Care (Stable)	Focus on weekly personal care support, 12/12 reviews by health professionals coordinator	Cost effective delivery of responsive service
		B	Personal Care (Flexible)	Higher weekly home care input, 3/12 reviews by health professionals coordinator, liaison with geriatric services	Identifying changing needs and appropriate response

Source: Parsons *et al.*, 2018[80]

3.4.2.2.2 Complex needs

As with the model for non-complex needs, the tool enables home care service coordinators to readily allocate clients into categories following assessment. The tool provides broad guidelines as to service provision and service aims. Such an approach enables allocation of resources commensurate with the respective case mix group.[80]

Table 17 describes the type of services, inputs, and focus associated with each care category.

Table 17 Operation of the case mix system for complex needs

		Description	4	5	6	7	8
Low disability	A	Support with: Lower body dressing	Disability only	Brittle social support and disability	Cognitive impairment and disability	Brittle social support, cognitive impairment, and disability	Significant rehabilitation
	B	Support with: Lower body dressing; bathing; meal prep					
Moderate disability	C	Further support with: Lower body dressing; bathing; meal prep; meds management					
	D	Further support with: Lower body dressing; bathing; meal prep; minor incontinence					
	E	Further support with: Lower body dressing; bathing; meal prep; moderate incontinence					
High disability	F	Significant support with: Upper and lower body dressing and moderate incontinence					
	G	Significant support with: Upper and lower body dressing and major incontinence					
	H	Extensive support with: Upper and lower body dressing					
			↓	↓	↓	↓	↓
			Promoting independence Recovery where possible	Support packages for carers Regular carer assessment	Training for workers Carer assessment Clinical assessment Programmes for dementia	At-risk group Carer and client regular assessments Workforce development	Intensive Community Rehab programme

Source: Parsons *et al.,* 2018[80]

In New Zealand, long-term care subsidies for older people are means-tested.[73] Individuals with assets over a given national threshold pay the cost of their care up to a maximum contribution. Those with assets under the allowable threshold contribute all their income, except for a small personal allowance. For people in their own homes, household management (e.g. cleaning), which accounts

for less than one-third of home support funding, is income-tested. Personal care (e.g. showering) is provided free of charge. Home care services are all provided by non-government agencies. Some district health boards have experimented with providing personal budgets to home support recipients to spend on selected approved services, but mostly home care services are directly funded by district health funds.[73]

No further funding mechanisms were discussed in the development of the new system.

3.4.3 Residential care

3.4.3.1 Describe the use of care bands to classify care needs

Residential care is part of the continuum of community-based care meant for older people who are unable to safely remain in their own homes for an indefinite period. Residential care – or aged residential care, as it is known in New Zealand – is funded by the district health boards.[86]

To enter aged residential care, the person must be needs assessed by a NASC unit as:[86]

- Having high, or very high, needs which are indefinite (i.e. the person's condition is not expected to reverse)
- Being unable to be safely supported within the community
- Being aged 65 years or over; or aged under 65 years, but with similar support needs to people aged over 65 years who need residential care, and
- Being eligible for publicly funded health and disability services.

The needs assessment process includes an interRAI Long-Term Care Facilities Assessment System (interRAI LTCF) assessment, which became mandatory for providers to use as the primary means of assessing residents and informing care planning in 2015.[86]

Funding for aged residential care in New Zealand utilises a very simplistic approach, whereby the needs assessment places individuals who enter aged residential care into one of four levels of care or bands, with each band worth a fixed weekly amount of subsidy.[86,87] Introduced in 2001, these care categories are now believed to be out of date, reflecting a time when rest home care was used as the de facto support for older people with low to moderate needs, a level of support now met by home care.[86,87] Further, it has been argued that the current system is characterised by limited innovation and development of an industry that is well placed to support the acute sector. New Zealand is now looking to new models of funding, such as the third version of the Resource Utilization Groups (RUG-III) case mix system developed in the USA.[87] However, for the purpose of this report, we will describe the current system in the following sections.

3.4.3.1.1 What care bands are used?

If the NASC process determines that an older person's needs may be best met in an aged residential care setting, there are four care categories that a person may be allocated to. The four categories broadly encompass the following levels of need:

- **Rest home care** – the resident is assessed as generally able to be independent (they are mobile and can feed themselves), but they need assistance with personal care or supervision of ADLs. They are assessed as unable to safely live in their own homes (or other community settings) due to either their disability needs and/or a lack of informal supports.
- **Continuing care** – the resident is assessed as having significant disability, usually in combination with medical problems, which requires 24-hour supervision with registered nurse input for their care, and assistance with mobility.
- **Dementia care** – the resident is assessed as needing 24-hour supervision in a secure environment. Dementia residents must be provided care in a separate facility/annex from rest home and continuing care.

- **Psychogeriatric care** – the resident is assessed as needing 24-hour supervision and specialist nursing care. This level of care is for people with major behavioural issues including severe dementia or addictions.[86]

With regard to aged residential care, the interRAI LTCF assessment must be undertaken in order to re-categorise the resident's level of care, should their needs change, so they can receive a higher level of care (e.g. change of rest home level to dementia care).[86]

Initially, providers must have an interRAI LTCF assessment completed and a care plan developed within 21 days of a resident's admission. Care plans must then be reviewed either every 6 months, or when a resident's status changes – in both cases, the care plan will be informed by a subsequent interRAI LTCF assessments. [86]

3.4.3.2 Describe the linking of care bands to service or resource allocation

Care service agreements stipulate the scope, specifications, and terms and conditions of residential services purchased by the district health boards. The aged residential care funding model is intended to reflect these contractual arrangements.

There are two national age-related residential care service agreements:

1. The *Age-Related Residential Care Services Agreement*, which covers rest home, continuing care ('hospital'), and dementia care,[88] and
2. The *Aged Residential Hospital Specialised Services Agreement*, which covers specialised hospital-level care ('psychogeriatric').[88]

The scope of services under the age-related residential care service agreements includes:

- Accommodation
- Needs assessment, care planning, and care delivery (including the use of interRAI assessment tools)
- Minimum staffing levels (related to site management and care staff)
- Ancillary services, such as food preparation and supply, and laundry services to an appropriate standard
- Amenities and equipment for people with age-related disabilities/conditions
- Primary medical services and pharmacy services
- Access to other health and social services
- Access to recreation, such as day activities, and
- Quality and risk management obligations.

The following services are excluded from the two national age-related residential care service agreements, and must either be funded through a different district health board or Ministry of Health funding stream, or by residents privately:

- Specialised assessment and rehabilitation services
- Customised equipment
- Equipment or services for conditions covered by separate funding arrangements
- Some allied health and person-related services
- Clothing and personal toiletries, and
- Some personal costs.

While these services are excluded from the two national age-related residential care service agreements, providers are required to ensure that each resident can access them.[86]

Each of the four care categories under the two age-related residential care service agreements has a separate price. The care category prices are intended to cover both the operating and capital costs of aged residential care provision specified in the two national agreements and reflect the average cost of care for residents within each of the care categories. The expectation is that providers will allocate resources across residents of higher and lower need in a way that is clinically and financially appropriate.[86]

Figure 5 shows the median annual contract price across territorial local authorities (TLAs) by care category as at 1 July 2018. The figure shows that, compared with the rest home care price, the dementia price is approximately 36% higher, the continuing care price is approximately 58% higher, and the psychogeriatric price is about 79% higher.

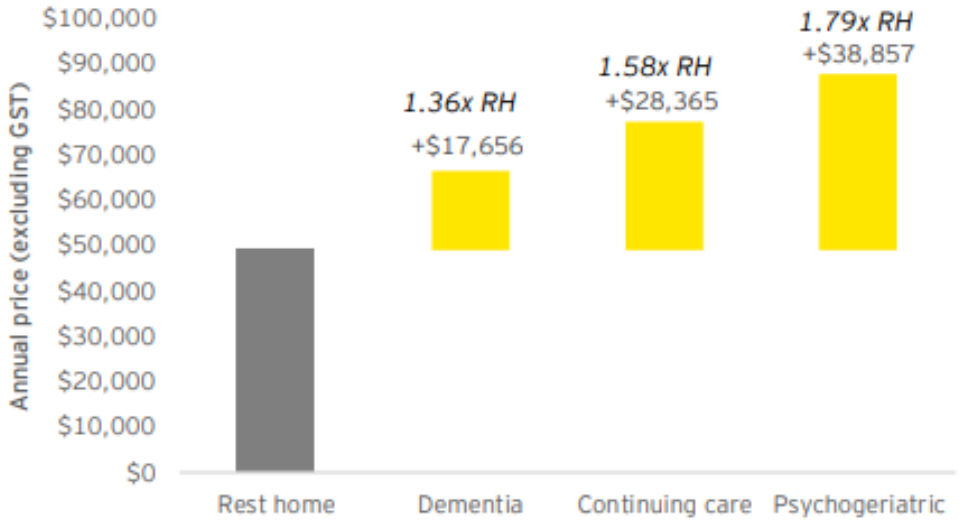

Figure 5 Age-related residential care contract prices by level of service, and values relative to the rest home price (as at July 2018)

Source: Ernst & Young, 2019[86]

The prices are based on a bed day – that is, a day occupied in a facility bed by a resident. Providers are paid on this basis, for the number of days in a 2-week period that their available beds have been occupied by residents. This means that the revenue a provider receives is based on the occupancy of their facility, and, for providers that offer more than one category of care, the mix of residents they have.[86]

The care category prices have been updated annually since their inception, usually based on funding provided to district health boards by the Ministry of Health for cost inflation. At certain times, policy decisions have been made to adjust prices, including a series of increases in the price for dementia care starting in 2011, an increase in the rest home price in 2014, and increases in all prices to reflect the roll-out of New Zealand's pay equity policy.[86]

In New Zealand, long-term care subsidies for older people are means-tested.[73] Individuals with assets over a given national threshold pay the cost of their care up to a maximum contribution. Those with assets under the allowable threshold contribute all their income, except for a small personal allowance. District health funds cover the difference between a person's payments and the contract price for residential care.

With regard to residential care, the funding model in New Zealand is also based on location. The care category prices are adjusted by geography based on 75 TLA areas to reflect the funding model's

intention to compensate providers for differences in capital costs based on where they are located. The underlying premise of the TLA pricing framework is that efficient, market-clearing prices are likely to differ by geographic area (i.e. the price that incentivises providers to develop sufficient capacity to meet demand varies based on where a facility is, or will be, located). As such, nationally standardised prices need to be adjusted in order to enable local markets to clear (i.e. supply meets demand).[86]

The original TLA pricing framework set in 1999[89] estimated that the 'capital charge' component of care category indicative prices ranged from (minimum to maximum):

- Rest home: 29% to 36% (NZ$23 to NZ$30)
- Dementia: 23% to 29% (NZ$22 to NZ$30), and
- Continuing care: 20% to 26% (NZ$24 to NZ$32).

Since operating costs were assumed to be the same across the country, differences in TLA prices only reflected estimated differences in capital charge by geography.

The indicative care prices were not fully funded as the TLA pricing framework was rolled out.[90] Instead, the capital charge component of the price was reduced and a targeted price uplift approach was used – facilities that were below 89% of the indicative price received funding increases, and those that were above this threshold did not. The funding was targeted at rest home and dementia services.[86]

Using data supplied by the Ministry of Health, the Ernst & Young review of the existing aged residential care funding model, published in 2019, reported that the range between the minimum and maximum TLA prices is as follows:

- Rest home: NZ$11.60 (NZ$7.60 in 2000)
- Dementia: NZ$13.50 (NZ$8.03), and
- Continuing care: NZ$13.10 (NZ$7.99).

In practice, price adjustments have been made at the same percentage rate across TLAs. In principle, TLA prices could be changed by individual rates, but they have not been.

The TLA prices also play an important role in the funding model for aged residential care being used:

- To determine the maximum contribution a resident can be asked to pay for contracted services, and the resulting subsidy a district health board is required to pay for contracted services. This means that the amount of the maximum contribution a resident pays varies based on the TLA in which the facility they reside in is located.
- In the population-based funding formula in order to help determine the national average cost for health of older people services, and subsequently to inform the distribution of the formula to district health boards. Since the population-based funding formula is based on national averages (stratified by age and level of deprivation), this means that district health boards with lower (or higher) TLA prices than the national average receive more (or less) on a per capita basis.[86]

3.5 The Netherlands

3.5.1 Background

In the Netherlands, nursing and care at home can support people with a disease or disability and the elderly to live at home for as long as possible.[91] Nursing includes medical care, such as wound care, preparing and / or administering medicines, stoma care and care with a catheter. Home care includes help with dressing and undressing, washing and showering and skin care. This is often referred to as 'general daily life activities' (ADLs). [91] Domestic help is also possible and includes cleaning the house, running errands, preparing meals, doing laundry, taking care of plants and pets, and so on.[92]

In 2015, the Netherlands underwent an extensive reform, and nursing and care at home are now governed by three Acts: the Health Insurance Act (Zvw); the Long-term Care Act (Wlz); and the Social Support Act (Wmo). [93] The Health Insurance Act (Zvw) obliges residents of the Netherlands to purchase a basic health insurance package for essential treatment services. The Health Insurance Act covers home care for clients who need care for less than 24 hours per day. The Long-term Care Act (Wlz) regulates care in institutions (residential care) and nursing, care and domestic help in the community (home care) for people who need intensive, 24-hour-per-day supervision.[93,92] This functions by use of a mandatory collective health insurance for non-individually-insurable health cost risks.[94] Care at home and domestic help for those who need care for less than 24 hours per day is regulated by the Social Support Act (Wmo 2015) and is the responsibility of municipalities.[93, 92]

3.5.1.1 Nursing at home (Health Insurance Act, Zvw)

As a person gets older or develops health problems, care may be required at home. The care can be short or long term. A district nurse gives an indication of which level of care is required. In most situations, the care is reimbursed from the basic package under the Health Insurance Act (Zvw).[95]

From 1 January 2015, 'nursing in the neighbourhood' is reimbursed from the basic package. Nursing in the neighbourhood comprises 'care as provided by nurses' and this care is provided in the insured person's own environment. The condition is that there is a need, or a high risk of need, for medical care. Together with GP care, nursing in the neighbourhood is aimed at allowing both older and younger adults to live at home for as long as possible despite old age, illness, or disability. 'Care as provided by nurses' means that all care that the nurse counts as part of their expertise (as described by the professional group) can be reimbursed from the basic package.[95]

Home support in the Netherlands is referred to as district nursing or 'nursing in the neighbourhood'. Nursing includes wound care, preparing and / or administering medication, stoma care and catheter care. Care includes help with activities of daily living (e.g. dressing and undressing, washing and showering and skin care). District nursing may also include coordination of care, identification of changes in patient circumstances, coaching (for example support with self-management) and preventative care. If necessary, the district nurse also makes agreements with the municipality about care, welfare and housing.[91]

No referral from a GP or medical specialist is required; an insured person can contact a home care organisation themselves. However, the care policy may describe certain conditions about which organisations can be engaged.[95]

Community nursing care can be provided by nurses and carers, depending on the care needs of the insured. The district nurse examines which care is required (indication) and determines who should provide the care. This form of care is usually reimbursed from the basic package. In that case, no personal contribution applies for this care at home.[95]

An insured person can opt for care in kind or request a personal budget from the health insurer.

For care in kind, the health insurer has an agreement with the care provider who will provide the care. The health insurer makes agreements with the healthcare provider and pays the healthcare provider.[95]

With a personal budget, an insured person can choose healthcare providers themselves and reach an agreement with them. The insured can apply for a personal budget from the health insurer. The indication of the district nurse determines the calculation of the amount of the personal budget. The most important conditions for a personal budget are as follows:

- The health insurer assesses whether the applicant is able to manage a personal budget and purchase high-quality care.
- An insured person must clearly indicate why they have opted for a personal budget. The insurer checks whether the set conditions have been met.

- Every personal budget has a budget plan. The budget plan carefully describes which care is purchased with the personal budget.
- The rules for the personal budget in the Health Insurance Act (Zvw) can differ by health insurer. The rules can be found in the policy conditions.[95]

3.5.1.2 Long-term care (Long-term Care Act, Wlz)

In the Netherlands, the right to residential care or intensive 24-hour home support under the Long-term Care Act (Wlz) is assessed by the Care Needs Assessment Centre. The Care Needs Assessment Centre is an independent administrative body which falls under the responsibility of the Ministry of Health, Welfare and Sport.[96] The Act covers both elderly people and younger people who have a serious mental, physical or sensory disability or a psychological disorder.[97]

An insured person who wants to qualify for care under the Long-term Care Act must submit an application to the Care Needs Assessment Centre. The Care Needs Assessment Centre makes a decision, known as an 'indication', regarding whether someone has access to care under the Long-term Care Act.[97] The insured package under the Long-term Care Act includes personal care, guidance, and nursing as forms of care.[98]

The Long-term Care Act is administered by 32 regional care offices (*zorgkantoren*) which perform several functions, including the contracting of private provider organisations and the material control of provider organisations.[99]

Long-term care can be delivered in multiple forms.[100] Insured individuals with an indication for long-term care can choose to live in an institution to receive the care. Under certain conditions, they can also choose to receive care at home with a full package at home (*volledig pakket thuis*, VPT), a modular package at home (*modulair pakket thuis*, MPT), or to arrange care themselves with a personal budget. The residential and home care packages are forms of care in kind, where the care office arranges the care and the surrounding administration in consultation with the care providers. In the case of a personal budget, the insured person receives a budget with which they can purchase care themselves. This budget is not transferred to the insured person's own bank account, but is managed by the Social Insurance Bank. The insured person can have payments made from this budget to their care providers, and must be accountable for this to the care office.[100]

3.5.1.3 Home care and domestic support (Social Support Act, Wmo 2015)

Care at home and domestic support fall under the Social Support Act (Wmo 2015) if the individual requires less than 24-hour-per-day care. Personal care (in the sense of ADLs support) if an insured person is not sufficiently self-reliant – for example, in connection with a psychiatric disorder or disability, or a mental or sensory disability – aimed at remedying a lack of self-reliance is regulated by the Social Support Act. This care can be requested via the municipality in which the insured person lives. A personal contribution may apply to this care.[95]

Assessment of eligibility is the responsibility of the municipalities and is mostly carried out by employees of the municipality or by social district teams, although in some cases this is delegated to the Care Needs Assessment Centre. The assessments (known as 'kitchen table dialogue' (*keukentafelgesprek*)) focus initially on exploring the informal supports available to the individual before professional assistance is considered.[93]

3.5.2 Describe the use of care bands to classify care needs

3.5.2.1 Are care bands used to classify the assessed care needs of prospective users of home support services or residential care, or both?

3.5.2.1.1 Home and personal care (Health Insurance Act, Zvw)

The development of a case mix classification system for home support is currently being explored, with a view to introducing a prospective payments system for people who need less than 24-hour supervision and fall under the Health Insurance Act.[5] At present, there are multiple classification systems in use in Dutch home care (e.g. NANDA-I, Omaha, or interRAI).[5]

3.5.2.1.2 Long-term care (Long-term Care Act, Wlz)

If a person is eligible for long-term care, the Care Needs Assessment Centre provides the insured person with a decision, known as an indication. Within the indication, the Care Needs Assessment Centre designates the insured person to the appropriate care profile. These care profiles dictate the nature, content, and global scope of the care required.[97]

These care profiles are broadly described and not expressed in hours of care per week. In the care plan discussion, the client and care provider then make concrete agreements about the care to be provided.[98]

To our knowledge, the Long-term Care Act is the only national scheme that uses a patient classification system in the Netherlands. Thus, this will be the system that is described in the following sections.

3.5.2.2 What care bands are used?

Care profiles are established by ministerial regulation, as noted in Article 3.1.1 of The Long-term Care Decision.[101]

The care profile must fit the 'foundations of care', which are based on the disorders and limitations of the person and the resulting current care need. There are six foundations of care:

1. Psychogeriatric disorder or disability
2. Medical condition or limitation
3. Physical disability
4. Sensory disability
5. Intellectual disability, and
6. Psychological disorder.

A series of care profiles are available and divided into relevant sectors. These sectors can be loosely mapped to the foundations of care, as illustrated in Table 18.

Table 18 Foundations of care mapped to care profile sectors

Foundations of care	Care profile sectors
Medical condition or limitation	Nursing and care
Psychogeriatric disorder or disability	Nursing and care
Physical disability	Physically handicapped
Sensory disability	Sensory disabled – auditory and communicative
	Sensory disabled – visual
Intellectual disability	Mentally handicapped
	Slightly mentally handicapped
Psychological disorder	Mental health sector, housing
	Mental health, group B

If an eligible person has been identified to have more than one foundation of care, the Care Needs Assessment Centre first looks at the foundation that has the greatest influence on the care need. If the corresponding care profiles do not sufficiently match the care needs, the Care Needs Assessment Centre can choose a profile that corresponds with one of the other foundations that have been established for that person. This can be due to limitations from the various foundations influencing each other, or on the basis of age-related client characteristics or specific behavioural problems.[102]

Due to the volume of data related to these care profiles, the most relevant sector to our research questions, nursing and care, will be presented in this section. Table 19 indicates the six care profiles under the nursing and care sector, along with descriptors according to Appendix A of the Long-term care scheme.[103] The remainder of the care profile sectors can be found in Appendix C. The care needs for each of the care profiles under the nursing and care sector are broadly described in Table 20.[103]

Table 19 Nursing and care sector care profiles

Nursing and care sector	Descriptor
Sheltered living with intensive supervision and extensive care	Clients need intensive guidance combined with extensive care. The reason for this can vary.
Protected living with intensive dementia care	Due to serious dementia problems, clients require intensive guidance and care. The clients are (almost) completely dependent on care.
Protected living with intensive care and nursing	Due to severe somatic disabilities, clients need support, intensive care, and nursing at many times of the day, in a protective living environment.
Protected housing with very intensive care, due to specific conditions, with an emphasis on guidance	Due to a chronic illness, clients require specific guidance in combination with very intensive care and nursing in a protective living environment.
Protected housing with very intensive care, due to specific conditions, with an emphasis on care/nursing	Due to a serious general medical condition/illness, clients require specific and very intensive care and nursing in combination with guidance in a protective living environment.
Restorative treatment with nursing and care	Medical specialist diagnostics/intervention has usually taken place with clients. Following the intervention, there is a need for restorative treatment that requires an additional integrated and multidisciplinary approach.

Table 20 Description of the care needs per care profile under the nursing and care sector

Care needs	Care profiles					
	Sheltered living with intensive supervision and extensive care	Protected living with intensive dementia care	Protected living with intensive care and nursing	Protected housing with very intensive care, due to specific conditions, with an emphasis on guidance	VV Protected housing with very intensive care, due to specific conditions, with an emphasis on care/nursing	VV Restorative treatment with nursing and care
Social self-reliance	Need assistance with many aspects: communicating, making decisions, and performing tasks.	Need assistance with all aspects of social self-reliance.	Need guidance in understanding what others say and making themselves understandable to others. Also need supervision and stimulation with initiating and performing tasks.	Need full guidance with all aspects of social self-reliance. In particular, there is a strong need to provide daily structuring. These clients need a fixed structure and help with organising the day.	Need full guidance with all aspects of social self-reliance. In particular, there is a strong need to provide daily structuring.	Need help in all aspects of social self-reliance.
Psychosocial/cognitive function	Need help, supervision, or guidance with all psychosocial/cognitive functions.	Need continuous help, supervision, and direction with various psychosocial/cognitive functions.	Clients often or continuously need help, supervision, or direction regarding concentration, motivation, and psychosocial well-being.	Need continuous help, supervision, or direction and guidance with regard to their psychosocial/cognitive functions.	Clients require a takeover of psychosocial/cognitive functions due to limitations in concentration and motivation.	Need continuous help, supervision, and direction with regard to various psychosocial/cognitive functions.
ADLs	Need supervision and stimulation for minor grooming tasks, washing, and dressing.	Need assistance with all aspects of ADLs, including eating and drinking; minor grooming tasks; care for teeth, hair, nails, and skin; toileting; washing; and dressing.	Need assistance with various aspects of ADLs. Supervision and stimulation may be needed with eating and drinking.	Need a lot of help with different aspects of ADLs, especially for small grooming tasks; care for teeth, hair, nails, and skin; and washing.	Clients require minimal assistance with regard to all aspects of ADLs.	Need assistance with all aspects of ADLs, including eating and drinking; minor grooming tasks; care for teeth, hair, nails, and skin; toileting; washing; and dressing.

Care needs	Care profiles					
	Sheltered living with intensive supervision and extensive care	Protected living with intensive dementia care	Protected living with intensive care and nursing	Protected housing with very intensive care, due to specific conditions, with an emphasis on guidance	VV Protected housing with very intensive care, due to specific conditions, with an emphasis on care/nursing	VV Restorative treatment with nursing and care
Mobility	Need supervision or stimulation. Indoors, the client has limited autonomy. Relocation outside the home generally requires assistance or care.	Clients often need help and care. Indoors, the client has very limited ability to move independently and is not able to move independently at all outdoors.	Need assistance both indoors and outdoors (often using a wheelchair).	Often need help with indoor mobility, and a companion is always needed outdoors.	Clients need help with mobility both indoors and outdoors.	Often need help with mobility. During the period of residence, the mobility problem diminishes substantially.
Nursing attention	Clients may be in fragile health due to a chronic illness that requires constant nursing attention.	Nursing attention is necessary (including prevention of pressure ulcers and infections).	Client has a continuous need for nursing attention (including wound care and pain relief).	Nursing is necessary to monitor the chronic disease and to take appropriate measures if necessary.	Specialised nursing attention (e.g. prevention of pressure ulcers, infections, pneumonia) is needed continuously.	Nursing attention is required in the context of recovery.
Behavioural problems	Clients may have some behavioural problems that occasionally require help, supervision, or direction.	Clients can sometimes show behavioural problems. This mainly concerns compulsive behaviour, uncontrolled/disinhibited behaviour, or reactive behaviour.	In general, there are no behavioural problems for these clients.	Clients often have behavioural problems, which means that help, supervision, or direction is often or continuously required in those situations.	In general, there are no behavioural problems for these clients.	Clients can sometimes display behavioural problems.
Psychiatric problems	Psychiatric problems can also occur with these clients, especially passive in nature.	Psychiatric problems occur in some of these clients, mainly passive in nature.	Psychiatric problems can occur in these clients, especially passive in nature.	Some clients show psychiatric problems, both passive and active in nature.	These clients usually do not have any psychiatric problems.	Usually there are no psychiatric problems.

Care needs	Care profiles					
	Sheltered living with intensive supervision and extensive care	Protected living with intensive dementia care	Protected living with intensive care and nursing	Protected housing with very intensive care, due to specific conditions, with an emphasis on guidance	VV Protected housing with very intensive care, due to specific conditions, with an emphasis on care/nursing	VV Restorative treatment with nursing and care
Counselling goal	Guidance regarding deterioration, but can also be stabilisation.	Guidance regarding deterioration.	Guidance regarding deterioration, but can also be stabilisation.	Guidance regarding gradual deterioration.	When the care situation deteriorates.	Aimed at stabilisation, but also in the event of deterioration.
Structural need for care	Clients have a structural need for care several times a day.	Clients have a structural need for care several times a day.	Clients have a structural need for care several times a day.	Clients have a structural need for care several times a day.	Clients have a structural need for care several times a day.	Temporary need (2–6 months) for extra treatment and care several times a day.
Changes to the presentation of the disability	Slowly to quickly.	Slowly to quickly.	Often changes quickly.	Often changes slowly.	Often changes slowly.	Changes slowly.
Dominant foundation of care	Usually a psychogeriatric or somatic illness/condition.	Usually a psychogeriatric illness/disorder.	Usually a somatic illness/condition.	Usually a somatic illness/disorder or a psychogeriatric illness/disorder.	Usually a somatic illness/condition.	Usually a somatic or psychogeriatric illness/disorder.

Under the Long-term Care Act (Wlz), the client is entitled to have the care provider organise a meeting with them before (or as soon as possible after) the start of the care provision in order to plan about:

- The goals set with regard to the provision of care for a specific period, and the way in which the care provider and the insured person attempt to achieve the set goals
- The care providers who are responsible for the various components of the care provision, the manner in which coordination between those care providers takes place, and who the insured person can hold accountable for this coordination
- The way in which the insured person wishes to organise their life and the support that the insured person will receive from the care provider, and
- The frequency with which, and the circumstances under which, this will be evaluated and updated with the insured person.[104]

According to Article 8.1.1 of the Long-term Care Act, the client is entitled to two meetings with their care provider per year in order to evaluate and update the agreement regarding the provision of care.[104]

Where an indication has been granted for long-term care, the decision states:

- The results of the preliminary investigation
- The conditions, limitations, disorders, or handicaps that make the person dependent on care
- The care profile (possibly with the characteristic 'conducting research into additional care'), and
- The commencement date and period of validity.

Objections and appeals against the assessment decision are open in accordance with the General Administrative Law Act.[102]

3.5.3 Describe the linking of care bands to service or resource allocation

The Long-term Care Act describes the use of care profiles in order to classify people's levels of care need and to specify the type (but not the amount) of care each client needs. Furthermore, funding of long-term care is linked to these care profiles via care weight packages (*zorgzwaartepakket*, ZZP), and the Dutch Healthcare Authority (*Nederlandse Zorgautoriteit*, NZa) sets the tariffs of the packages.[99]

The NZa sets the rates for home care and residential care, as per the Policy rule for performance descriptions and rates for care intensity packages and full package at home 2020.[105] The rates set by the NZa on the basis of this policy rule are maximum rates. When making production agreements, the care office and the care provider can agree on lower rates.

For certain postcodes which have more expensive care delivery, flexible rates are permitted. The minimum rate is non-negotiable, whereas the maximum rate is negotiable. The care office and the care provider can therefore agree on different rates.[105]

In the Netherlands, the long-term care system is funded by social security premiums, taxes, and co-payments. The Long-term Care Act (Wlz) is a compulsory health insurance policy based on solidarity.[106] According to the European Commission's *Joint Report on Health Care and Long-Term Care Systems and Fiscal Sustainability*, in 2016, the amount of the premium was 9.65% of the income tax, with a ceiling of €33,589.[107] In addition, co-payments are income- and wealth-dependent, based on factors such as whether the client lives at home or in a care facility; is aged under or over 65 years; and is single, married, or has a domestic partner. However, these co-payments cover only a small

portion of the total costs of long-term care (10% of the total 2015 expenditure under the Long-term Care Act).[106]

3.6 USA, federal level

Home care and long-term residential care are available through two USA Government programmes: Medicare and Medicaid. The Department of Veterans Affairs also covers some long-term care, but this coverage is not discussed in this review as it covers a specific population only.

3.6.1 Background

3.6.1.1 Medicare

Medicare is an insurance programme. Medical bills are paid from trust funds which covered individuals have paid into. It primarily serves people aged over 65 years, whatever their income, but also serves younger people with disabilities, as well as dialysis patients. Patients pay part of the care costs through deductibles for hospital and other expenses; deductibles in this context are equivalent to excesses, i.e. the amount of money a patient must pay out of pocket for services covered by their insurance before their plan begins to pay. Small monthly premiums are required for non-hospital coverage. Because Medicare is a federal programme, it is basically the same throughout the USA and is run by the Centers for Medicare & Medicaid Services, a federal government agency.[108]

Medicare will only pay for long-term care if an individual requires skilled services or rehabilitative care. Patients can receive either home healthcare or skilled nursing facility care.

Medicare will pay for nursing home care in a skilled nursing facility for a maximum of 100 days of care. These facilities are for individuals who require skilled nursing care, not those who require non-skilled assistance with ADLs only, although assistance with ADLs will be provided alongside skilled nursing care in these facilities.[109]

Medicare will also cover skilled nursing care in the home through home health packages. Home health is for those who require part-time or intermittent skilled medical care (as opposed to full-time care, which would be provided in a skilled nursing facility), and does not cover homemaker services or personal care if that is the only care needed. To be eligible, patients must be homebound, and certified as such by a doctor.[110]

Medicare does not cover help with ADLs (like bathing, dressing, using the bathroom, and eating) or personal needs that could be safely and reasonably performed without professional skills or training if that is the only care needed.

3.6.1.2 Medicaid

Medicaid is an assistance programme for people with low incomes. Medicaid is a joint federal and state government programme and, therefore, eligibility rules and the services covered vary from state to state.[111]

Medicaid does offer long-term residential care and home care to those who need it; this is covered in more detail in Section 3.7 in relation to our case study state, Minnesota.

3.6.1.3 History of case mix reimbursement

Case mix reimbursement has become the dominant mechanism for publicly funded nursing home care in the USA. A variety of nursing home case mix systems were developed from the early 1970s to the mid-1980s.[112] Case mix reimbursement systems became more common throughout the 1990s. In 1990, Medicare- and Medicaid-certified nursing homes were mandated by Congress to use a standardised, reproducible, comprehensive functional assessment instrument to assess all patients and guide the development of individualised care plans. In 1989, the Health Care Financing Administration began the Multistate Nursing Home Case Mix and Quality demonstration. These developments led to many states implementing a Medicaid and/or Medicare nursing home case mix payment system.[112]

Additional changes to the Medicare system were introduced in the Balanced Budget Act of 1997.[113]

Medicare reimbursement of skilled nursing care changed from a cost-based system to a prospective payment system (PPS) based on a case mix classification system.[113] The PPS for skilled nursing facilities was implemented in 1998, the PPS for Medicare home health services was implemented in October 2000, and the PPS for long-term hospitals was implemented in 2002. The PPS replaced the interim payment system (IPS) which was implemented in 1997. The changes were intended to constrain Medicare home health expenditures, which had increased rapidly in the preceding decade.[114]

The most recent change for Medicare was in 2019–2020: the Patient-Driven Groupings Model (PDGM) was introduced for skilled nursing facilities in 2019, and for home health in 2020.

3.6.2 Medicare home support

3.6.2.1 Describe the use of care bands to classify care needs

Medicare home healthcare consists of part-time or intermittent skilled medical care. It does not cover homemaker services or personal care if that is the only care needed.[115]

In 2020, the Centers for Medicare & Medicaid Services introduced a new home health case mix system, the PDGM, to adjust payment for differences in patient characteristics.[116] The case mix classification system is outlined in Figure 6.

The PDGM has several levels. The first is admission source and timing, which is extracted from claims data. A newly initiated home health period (with no home health services in the preceding 60 days) is classified as ‘early’, while periods that are immediately preceded by a 30-day period during which home health services were provided are classified as ‘late’.[116] Early periods that are preceded by a stay at a hospital or inpatient rehabilitation facility, or SNF are classified as institutional periods. Early periods that are not preceded by these services are classified as community-admitted periods. Later periods are classified as institutional if they are preceded by a hospital stay; otherwise they are classified as community-admitted periods.[116] The second level is clinical groupings. The third level is functional impairment: patients are assigned to one of three functional impairment levels based on reported cognitive and physical functioning information.[116] The fourth level is comorbidity adjustment; there is a three-tiered adjustment for selected comorbidities.[116]

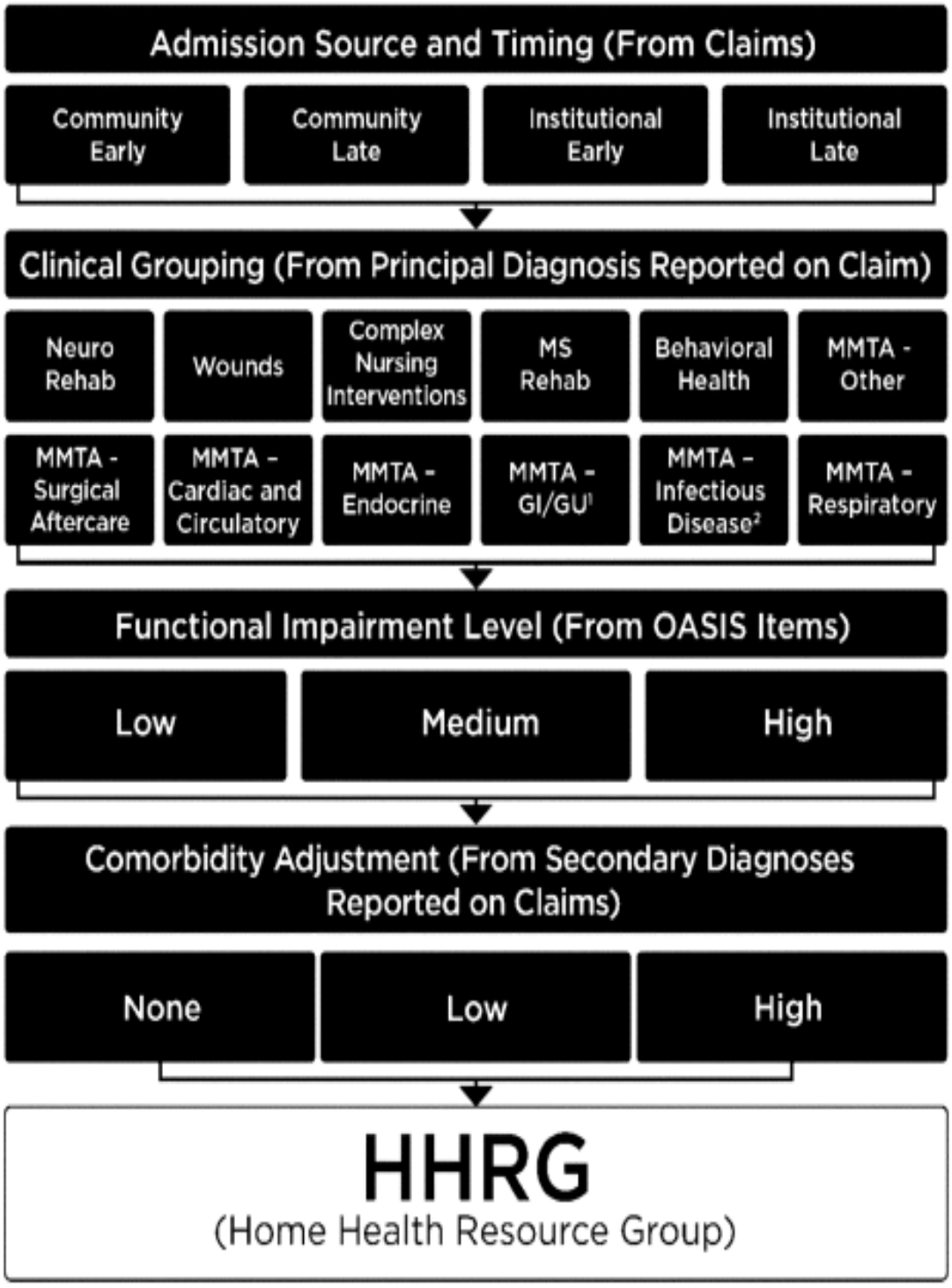

Figure 6 Home health PDGM, 2020

Abbreviations: MMTA=medication management, teaching, and assessment

Source: Centers for Medicare & Medicaid Services, 2019[117]

Under Medicare, in order for a patient to receive home healthcare services, they must be under the care of a physician. This physician must develop and periodically review a care plan. The certifying physician confirms the patient's home health eligibility through re-certifying eligibility and reviewing the home health care plan every 60 days.[118]

Additionally, Medicare beneficiaries must receive written notice in advance of the home health agency reducing or terminating ongoing care. Patients also have the right to be advised of the name, address, and telephone number of the Quality Improvement Organization in their local area if the patient has a complaint about the quality of care received, or if the patient needs to appeal a healthcare provider's decision to discontinue services.[119]

3.6.2.2 Describe the linking of care bands to service or resource allocation

Payments to home health agencies start with a base payment amount, which is based on the cost for an average home health patient in an average market area. The base payment amount for 2020 was US$1,864.[116]

The base rate is updated annually and is based on the projected change in the home health market basket, which measures changes in the prices of goods and services bought by home health agencies. The update for 2021 is 2.7%.

The payment system is outlined in Figure 7.

In 2020, the Centers for Medicare & Medicaid Services introduced a new home health case mix system, the PDGM, to adjust payment for differences in patient characteristics.[116]

Payments are case mix adjusted using 432 different Home Health Resource Groups.[116] Each Home Health Resource Group has a national relative weight reflecting the average relative costliness of patients in that group, compared with the average Medicare home health patient.

Payment is then adjusted for geographic factors. There is a wage and a non-wage component to this adjustment. The wage portion – 76.1% – is adjusted by a version of the hospital wage index to account for geographic differences in the input-price level in the local market for labour-related inputs to home health services. The non-wage portion is similarly adjusted.

Low-use periods (periods with relatively few visits) are paid on a per visit basis. The threshold for the low-use payment adjustment varies from two to six visits, depending on the payment group to which a period has been assigned. Periods above the threshold receive the full case mix-adjusted 30-day payment under the PDGM.[116]

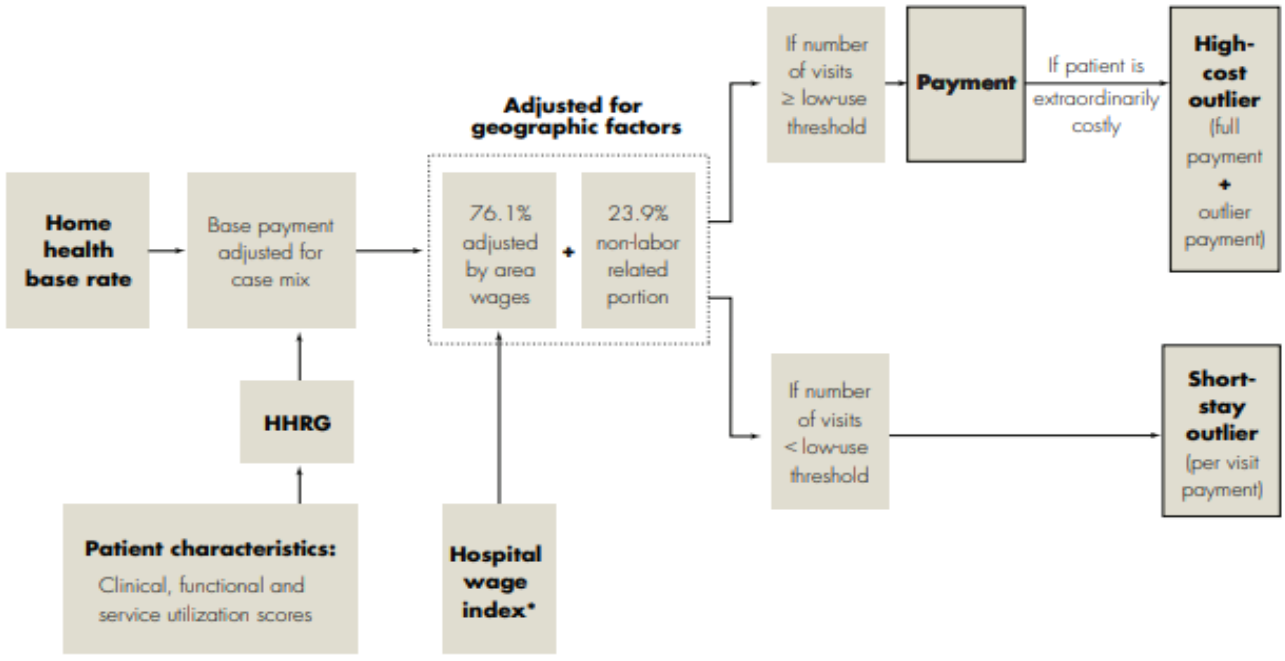

Figure 7 Home health PPS model

Source: Medicare Payment Advisory Commission, 2020[116]

3.6.3 Medicare skilled nursing facilities

3.6.3.1 Describe the use of care bands to classify care needs

Medicare offers skilled nursing care in a skilled nursing facility (SNF) for beneficiaries who need short-term skilled care (nursing or rehabilitation services) on an inpatient basis following a hospital stay. Medicare covers up to 100 days of SNF care per spell of illness. Beginning on day 21 of an SNF stay, a patient is responsible for a daily co-payment. In 2020, the co-payment was US$176.[120]

Payments are made daily to SNFs and are determined by summing payment rates for six components of care: nursing, physical therapy (PT), occupational therapy (OT), speech-language pathology services, non-therapy ancillary services and supplies, and non-case mix.[120] The numbers of case mix groups for each component of care are as follows: nursing: 25; PT: 16; OT: 16; speech-language pathology services: 12; and non-therapy ancillary services and supplies: 6.[120]

The care bands are based on functional items found in Section GG, a relatively new section of the Minimum Data Set version 3.0. The Minimum Data Set is a federally mandated clinical assessment for all residents of Medicare or Medicaid certified nursing homes. The assessment determines each resident's functional capabilities and health needs.[121] Section GG of the Minimum Data Set version 3.0 offers standardised and more comprehensive measures of functional status and therapy needs; it measures three self-care activities (eating, oral hygiene, and toileting hygiene) and various activities relating to mobility. Section GG is assessed once at admission and once at discharge. SNFs have been collecting Section GG data since October 2016 as part of the requirements of the Improving Medicare Post-Acute Care Transformation Act of 2014.[122]

The components of PT and the associated case mix index for SNFs are reported in Table 21.

Table 21 PT clinical categories and case mix indexes for SNFs

Clinical categories	PT and OT GG-based function score	No. of stays	% of stays	Average PT costs per day	Case mix index
Major joint replacement or spinal surgery	0–5	8,437	0.50%	US$69	1.53
	6–9	17,957	1.00%	US$77	1.69
	10–23	132,397	7.10%	US$91	1.88
	24	1,700	0.10%	US$93	1.92
Other orthopaedic	0–5	27,833	1.50%	US$62	1.42
	6–9	61,489	3.30%	US$71	1.61
	10–23	186,578	10.00%	US$76	1.67
	24	1,522	0.10%	US$57	1.16
Medical management	0–5	166,311	8.90%	US$49	1.13
	6–9	190,023	10.10%	US$62	1.42
	10–23	741,671	39.60%	US$70	1.52
	24	15,881	0.80%	US$50	1.09
Non-orthopaedic surgery and acute neurologic	0–5	49,679	2.70%	US$55	1.27
	6–9	52,408	2.80%	US$66	1.48
	10–23	214,916	11.50%	US$72	1.55
	24	4,465	0.20%	US$54	1.08

Source: Acumen, 2018[122]

The components of OT and the associated case mix index for SNFs are reported in Table 22.

Table 22 OT clinical categories and case mix indexes for SNFs

Clinical categories	PT and OT GG-based function score	No. of stays	% of stays	Average OT costs per day	Case mix index
Major joint replacement or spinal surgery	0–5	8,437	0.50%	US$56	1.49
	6–9	17,957	1.00%	US$62	1.63
	10–23	132,397	7.10%	US$66	1.68
	24	1,700	0.10%	US$62	1.53
Other orthopaedic	0–5	27,833	1.50%	US$52	1.41
	6–9	61,489	3.30%	US$60	1.59
	10–23	186,578	10.00%	US$63	1.64
	24	1,522	0.10%	US$47	1.15
Medical management	0–5	166,311	8.90%	US$43	1.17
	6–9	190,023	10.10%	US$54	1.44
	10–23	741,671	39.60%	US$60	1.54
	24	15,881	0.80%	US$42	1.11
Non-orthopaedic surgery and acute neurologic	0–5	49,679	2.70%	US$49	1.3
	6–9	52,408	2.80%	US$57	1.49
	10–23	214,916	11.50%	US$61	1.55
	24	4,465	0.20%	US$46	1.09

Source: Acumen, 2018[122]

The components of speech-language pathology and the associated case mix index for SNFs are reported in Table 23.

Table 23 Speech-language pathology clinical categories and case mix indexes for SNFs

Presence of acute neurologic condition, speech-language pathology -related comorbidity, or cognitive impairment	Mechanically altered diet or swallowing disorder	No. of stays	% of stays	Average speech-language pathology costs per day	Case mix index
None	Neither	835,013	44.6%	US$8	0.68
None	Either	116,407	6.2%	US$24	1.82
None	Both	14,893	0.8%	US$36	2.66
Any one	Neither	465,348	24.8%	US$18	1.46
Any one	Either	208,53	11.1%	US$31	2.33
Any one	Both	32,28	1.7%	US$40	2.97
Any two	Neither	93,11	5.0%	US$26	2.04
Any two	Either	56,88	3.0%	US$37	2.85
Any two	Both	10,37	0.6%	US$46	3.51
All three	Neither	18,71	1.0%	US$38	2.98
All three	Either	17,50	0.9%	US$50	3.69
All three	Both	4,19	0.2%	US$57	4.19

Source: Acumen, 2018[122]

The components of nursing and the associated case mix index for SNFs are reported in Table 24.

Table 24 Nursing clinical categories and case mix indexes for SNFs

Nursing RUG	Nursing GG-based function score	No. of stays	% of stays	Nursing wage-weighted staff time	Case mix index
ES3	0–14	5,767	0.30%	420	4.04
ES2	0–14	10,738	0.60%	318	3.06
ES1	0–14	20,487	1.10%	303	2.91
HDE2	0–5	6,723	0.40%	249	2.39
HDE1	0–5	71,884	3.80%	207	1.99
HBC2	6–14	11,417	0.60%	231	2.23
HBC1	6–14	169,690	9.10%	192	1.85
LDE2	0–5	7,444	0.40%	215	2.07
LDE1	0–5	109,411	5.80%	179	1.72
LBC2	6–14	8,713	0.50%	178	1.71
LBC1	6–14	184,464	9.80%	148	1.43
CDE2	0–5	7,549	0.40%	194	1.86
CDE1	0–5	114,067	6.10%	168	1.62
CBC2	6–14	17,852	1.00%	160	1.54
CA2	15–16	2,048	0.10%	113	1.08
CBC1	6–14	467,881	25.00%	138	1.34
CA1	15–16	48,634	2.60%	98	0.94
BAB2	11–16	1,004	0.10%	108	1.04
BAB1	11–16	56,861	3.00%	102	0.99
PDE2	0–5	2,054	0.10%	163	1.57
PDE1	0–5	88,198	4.70%	153	1.47
PBC2	6–14	5,621	0.30%	125	1.21
PA2	15–16	295	0.00%	73	0.7
PBC1	6–14	425,809	22.70%	115	1.13
PA1	15–16	28,656	1.50%	69	0.66

Source: Acumen, 2018[122]

The components of non-therapy ancillary services and the associated case mix index for SNFs are reported in Table 25.

Table 25 Non-therapy ancillary services categories and case mix indexes for SNFs

Comorbidity score	No. of stays	% of stays	Average non-therapy ancillary services costs per day	Case mix index
0	439,319	23.5%	US$39	0.72
1–2	572,152	30.5%	US$55	0.96
3–5	581,544	31.0%	US$79	1.34
6–8	185,953	9.9%	US$113	1.85
9–11	67,789	3.6%	US$152	2.53
12+	26,510	1.4%	US$196	3.25

Source: Acumen, 2018[122]

Section GG of the MDS 3.0 is assessed once at admission and once at discharge. As patients are only allocated a maximum of 100 days of care through Medicare, movement through bands does not seem possible. There was no information on rights of appeal.

3.6.3.2 Describe the linking of care bands to service or resource allocation

Under the PPS, SNFs are paid a predetermined daily rate for each day of SNF care. The PPS rates are expected to cover all daily operating and capital costs that efficient facilities would be expected to incur in furnishing most SNF services, with certain high-cost, low-probability auxiliary services paid separately.[120]

The resource allocation model for SNFs is presented in Figure 8. Payment starts with a base rate for six components of care: nursing, PT, OT, speech-language pathology services, non-therapy ancillary services and supplies, and non-case mix (room and board services). Base payment rates are then adjusted for geographic differences in labour costs and for case mix. The initial payment rates were set in 1998 based on the average facility costs in 1995, updated for inflation. The base rates are computed separately for urban and rural areas.[120] The daily base rates for the six components of care for 2021 are given in Table 26.

Table 26 Daily base rates for 2021

Rate component	Urban rate	Rural rate
Nursing	US$108.16	US$103.34
PT	US$62.04	US$70.72
OT	US$57.75	US$64.95
Speech-language pathology services	US$23.16	US$29.18
Non-therapy ancillary services	US$81.60	US$77.96
Non-case mix	US$96.85	US$98.64

Source: Medicare Payment Advisory Commission, 2020[120]

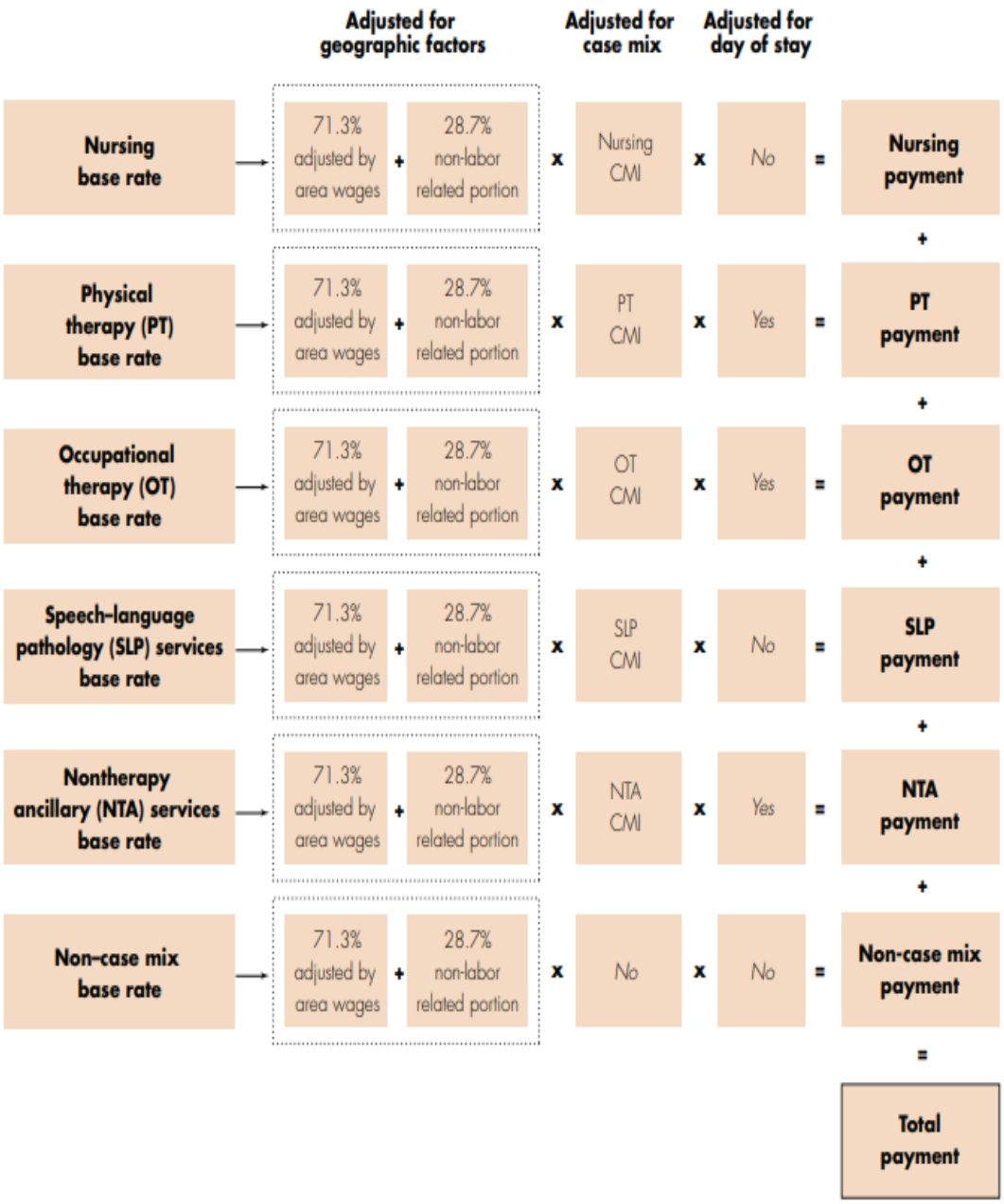

Figure 8 SNF resource allocation model

Source: Medicare Payment Advisory Commission, 2020[120]

3.6.4 Medicare long-term care facilities

3.6.4.1 Describe the use of care bands to classify care needs

Long-term care hospitals (LTCHs) care for chronically, critically ill patients with profound debilitation of multiple systems, and frequently with ongoing respiratory failure. In this instance, LTCHs are an alternative to acute care hospitals. In order to qualify for Medicare payments as an LTCH, a facility must meet Medicare's conditions of participation for acute care hospitals and have an average length of stay greater than 25 days. Coverage of LTCH stays is subject to Medicare's limits on inpatient hospital care; thus, beneficiaries treated in LTCHs are covered for 90 days of hospital care per illness,

with a 60-day lifetime reserve.[123]The LTCH PPS uses Medicare Severity-Long Term Care-Diagnosis Related Groups (MS-LTC-DRG) as a patient classification system. The MS-LTC-DRGs are the same Medicare Severity Diagnosis Related Groups used under the Inpatient PPS, weighted to reflect the different resources used by LTCH patients. Each patient stay is grouped into an MS-LTC-DRG based on:

- Diagnoses (including secondary diagnoses)
- Procedures performed (up to 25 procedures)
- Age
- Gender, and
- Discharge status.[124]

Coverage of LTCH stays is subject to Medicare's limits on inpatient hospital care; thus, beneficiaries treated in LTCHs are covered for 90 days of hospital care per illness, with a 60-day lifetime reserve.[123] We did not find details on review of classification or any information on rights of appeal.

3.6.4.2 Describe the linking of care bands to service or resource allocation

The resource allocation model for payment to LTCHs is shown in Figure 9. Payments to cases that qualify for the LTCH PPS rates are determined by adjusting a base payment rate for geographic differences in market area wages and for case mix. In 2021, the LTCH PPS base rate is US$43,755.34. The base rate for LTCHs that fail to provide data on specified quality indicators is reduced by two percentage points. To adjust payments for differences in market area wages, the labour-related portion of the base rate – 68.1% in 2021 – is multiplied by a version of the hospital wage index and the result is added to the non-wage portion. The wage-adjusted payment rate is then adjusted for case mix using Medicare severity long-term care diagnosis-related groups.[123]

There are adjustments made for short-stay outliers, high-cost outliers, and interrupted stays.[123]

Centers for Medicare & Medicaid Services updates the LTCH PPS rates annually based on the applicable market basket index, which measures the price increases of goods and services LTCHs need to provide patient care.[123]

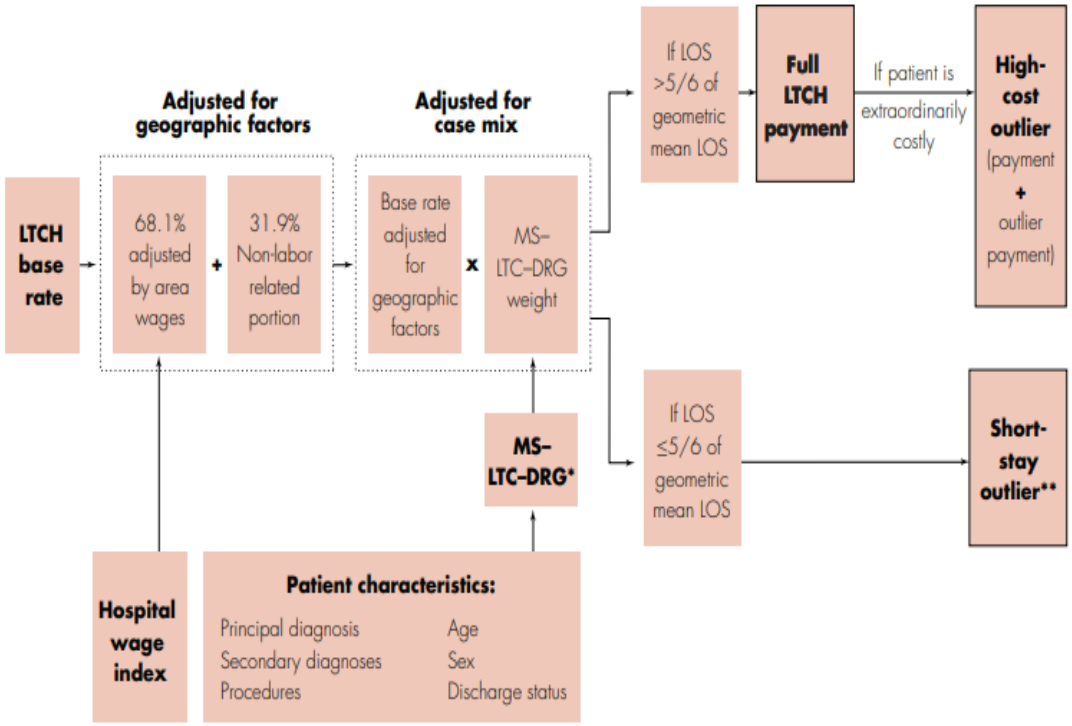

Figure 9 Resource allocation model for LTCH payments

Source: Medicare Payment Advisory Commission (MedPAC), 2020[123]

3.7 USA state level: Minnesota

3.7.1 Background

We have selected Minnesota as our case study USA state for Medicaid. Minnesota is the top-ranked state in *Advancing Action: A State Scorecard on Long-Term Services and Supports for Older Adults, People with Physical Disabilities, and Family Caregivers*.[125]

It has also used case mix classification for Medicaid reimbursement since the 1980s.[126]

Minnesota's Medicaid programme is called Medical Assistance and covers home care and long-term residential care for elderly and disabled individuals. Home care programmes are intended to delay or prevent nursing home placement, which saves the state money and allows the individual to age in place.[127]

Medicaid pays for nursing home care for people with limited financial resources. For those who wish to continue living at home, sometimes Medicaid will pay for home care if it can be obtained at a lower cost than in a nursing home. It does this through state-specific Medicaid Waivers, and several of these are in operation in Minnesota.[128]

3.7.2 Home support

3.7.2.1 Describe the use of care bands to classify care needs

The Minnesota Long Term Care Consultation Services Assessment Form is used to populate the case mix classification tool for several programmes. The Assessment Form is incorporated into the MnCHOICES web-based application tool.[129]

This case mix classification system is used for:

- The Alternative Care programme
- The Brain Injury Waiver programme
- The Community Access for Disability Inclusion Waiver programme, and
- The Elderly Waiver programme.[130]

There are 13 care bands in the Minnesota case mix classification system:[130]

- A – Low ADLs
- B – Low ADLs Behavior
- C – Low ADLs Special Nursing
- D – Medium ADLs
- E – Medium ADLs Behavior
- F – Medium ADLs Special Nursing
- G – High ADLs
- H – High ADLs Behavior
- I – Very High ADLs (Eating 3–4)
- J – High ADLs, Severe Neurological Impairment/3+ Behavior
- K – High ADLs Special Nursing
- L – Very Low ADLs/Age 65+
- V – Ventilator Dependent – EW

The Minnesota Department of Human Services outlined steps for arriving at a case mix classification; these are summarised in Figure 10 and Figure 11. Patients on a ventilator are treated separately to the rest of the population.

- Pre-step: Calculate score in ventilator dependency item in the Assessment Form and, if an individual is ventilator dependent, assign them to class V. If not, continue to next step.
- Step 1: Calculate scores for the eight ADLs in the Assessment Form to determine the total number of key ADLs in which the client is considered dependent, using Table 27.

Table 27 ADLs and dependency score

Value coded for item	Not dependent	Dependent
Dressing	0–1	2–4
Grooming	0–1	2–3
Bathing	0–3	4–5
Eating	0–1	2–4
Bed mobility (positioning)	0–1	2–3
Transferring (mobility)	0–1	2–4
Walking	0–1	2–4
Toileting	0	1–6

- Step 2: Determine the ADLs category as follows:
  - Low ADLs=dependent in 0–3 key activities of daily living
  - Medium ADLs=dependent in 4–6 key activities of daily living, and
  - High ADLs=dependent in 7–8 key activities of daily living.
- Step 3: Special nursing case mix categories: determine if special tube feeding or other special treatment, in combination with clinical monitoring every 8 hours, is taking place. Combined with the ADLs scores from Step 2, the resulting case mix is:
  - Low ADLs=C
  - Medium ADLs=F, and
  - High ADLs=K.
- Step 4: If an individual does not require special nursing, for High ADLs individuals only, skip to Step 7. For Low and Medium ADLs individuals, review the score in the behaviour item from the Long Term Care Consultation Services Assessment Form. If the score is 2 or greater, the resulting case mix is for those with Low ADLs=B, and those with Medium ADLs=E.
- Step 5: If an individual is not classified as 'Special nursing' or 'Behaviour', then those with Low ADLs are assigned to group, and those with Medium ADLs are assigned to group D.
- Step 6: Skip this step for individuals aged 65 years and older who are returning to, changing to, or continuing on the waiver programme; go to Step 7. Very Low ADLs: For individuals aged 65 years and older only who are classified as 'Case Mix A' after completing Steps 1–5, additional review of ADLs is required. An individual with no ADLs dependency; no dependency in toileting, positioning , or transferring; and less than three dependencies in bathing, dressing, grooming, walking, or eating is classified as 'Case Mix L'.
- Step 7: High ADLs classification: classification of individuals in the High ADLs category who did not meet the special nursing criteria specified in Step 3 begins with a review of the assessment score for 'Eating'. (Individuals with High ADLs and special nursing needs are classified as 'Case Mix K' under Step 3.) See more information about Case Mix G, H, I, and J classification in Steps 7 through 12. If the score in 'Eating' is 2 or less, skip Steps 8–10 and proceed to Step 11. If the score in Eating is 3 or more, go on to Step 8.
- Step 8: High score in 'Eating' plus neurodiagnosis: when an individual has a score of 3 or more in 'Eating', consider whether the individual also has a neuromuscular diagnosis from the following list:
  - Diseases of nervous system, excluding sense organs and excluding Alzheimer's disease. These include intracranial infections, meningitis, encephalitis, myelitis, and similar conditions.
  - Cerebrovascular disease, excluding atherosclerosis. These include cerebral haemorrhage, embolisms, infarctions, ischaemia, and similar conditions.
  - Fracture of skull (excluding cases without intracranial injury).
  - Spinal cord injury without evidence of spinal bone injury.
  - Injury to nerve roots and spinal plexus.
  - Neoplasms of the brain and spine.

  If any diagnosis is included within the list above, the classification is High ADLs=J:
- Step 9: High need in 'Eating' and 'Behaviour': If the individual has no diagnosis from the above code list, review the score on the assessment form for 'Behaviour'. If the score is 3–4, the classification is High ADLs=J.

- Step 10: If there is no diagnosis from the above code list and if the score in 'Behaviour' is not 3–4, proceed to the alternative box marked 'Not Neuro Dx' and mark the classification High ADLs=I.
- Step 11: If the score on the assessment form for 'Eating' is 2 or less, proceed to the box marked 'Behaviour'. If the score is 2 or more for 'Behaviour', the classification is High ADLs=H.
- Step 12: If the assessment form score does not meet the criteria for 'Behaviour', proceed to the alternative box marked 'Not Behaviour' and mark the classification High ADLs=G.[130]

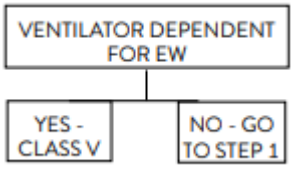

Figure 10 Ventilator decision tree, case mix classification for the Minnesota Elderly Waiver and Alternative Care programmes

Source: Minnesota Department of Human Services, no date[130]

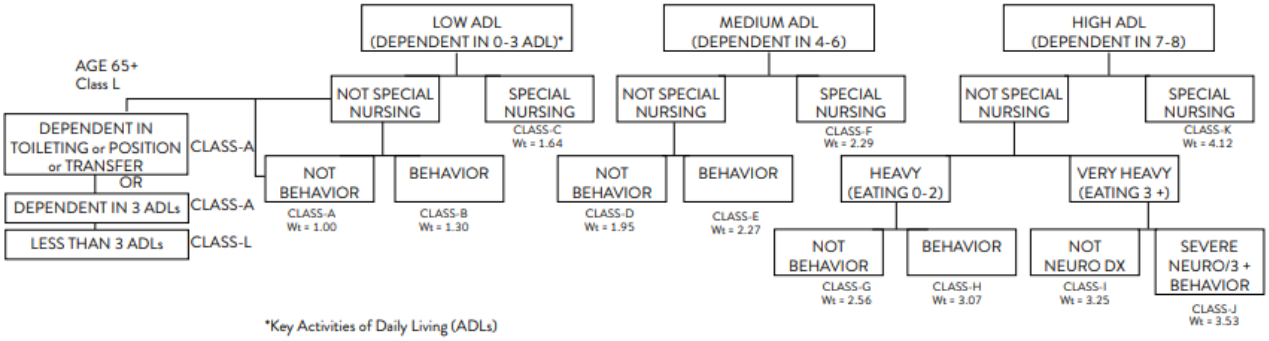

Figure 11 Main decision tree, case mix classification for the Minnesota Elderly Waiver and Alternative Care programmes

Source: Minnesota Department of Human Services, no date[130]

The assessment is conducted by certified assessors, who must have one of the following qualifications:[131]

- Bachelor's degree in social work plus at least 1 year of home and community-based experience
- Bachelor's degree in nursing with current licensure as a registered nurse, along with public health certification and at least 1 year of home and community-based experience
- Bachelor's degree in a closely related field plus at least 1 year of home and community-based experience, and
- Current licence as a registered nurse with at least 2 years of home and community-based experience.

The Minnesota Department of Human Services outlines four time points for long-term services and supports assessments:

- Initial assessment: An initial assessment is completed for people who are not currently receiving home and community-based services.

- Annual reassessment: A person needs an annual reassessment if the person is on a Medicaid waiver, e.g. the Elderly Waiver or Alternative Care programmes.
- Change-in-condition reassessment: When a person experiences a significant, potentially long-term change in need for services and supports before the anticipated annual reassessment, the lead agency must conduct a change-in-condition reassessment. The person, case manager, or others (on behalf of the person) may request a change-in-condition reassessment. Potential reasons for a change-in-condition reassessment include:
    - Emerging need or risk
    - Major health event, or
    - Worsening health condition if current services and/or supports do not meet the person's needs.
- Sixty-fifth birthday assessment: The county/tribal nation must conduct in-person reassessments for all people when they turn 65 years old.

The assessment is always conducted in person with the person being assessed.[132]

The Minnesota Department of Human Services indicated that an in-person assessment is needed in the following situations:

- Initial assessments and annual reassessments
- The person's level of care changes or is expected to change
- The person's home care rating changes or is expected to change
- The person requests an early reassessment
- The case manager and/or assessor uses their professional judgement to conduct an early reassessment, or
- The service agreement service span changes.[132]

If the person who was reassessed (not the case manager) disagrees with the reassessment results, they have the right to appeal.[133]

There are 10 steps in the appeals process for long-term services and support. They are as follows:

1. A county or tribal nation notifies a person about a change to his/her services and supports through a notice of action.
2. The person files an appeal in response to a notice of action.
3. The Minnesota Department of Human Services Appeals Division requests an appeal summary from the responsible agency.
4. The county/tribal nation continues services at the prior level pending the appeal's outcome (unless the appellant requests not to have a continuation of benefits).
5. The county/tribal nation and appellant may resolve the appeal before the fair hearing.
6. The county/tribal nation completes and submits the appeal summary.
7. The Minnesota Department of Human Services Appeals Division schedules a hearing.
8. The Minnesota Department of Human Services Appeals Division issues a decision.
9. The county/tribal nation implements the decision.
10. The appellant or county/tribal nation may request reconsideration from the Minnesota Department of Human Services Appeals Division.[134]

3.7.2.2 Describe the linking of care bands to service or resource allocation

In Minnesota, funding for home care is generally provided through personal budgets. Participants in home care programmes can choose the services, and the amount of services, that best meet their needs while staying within their assigned budget. There may also be limits on the amounts that can be spend for certain services.[135]

There are also rate caps for certain services.[136]

Rates for services and budget caps by case mix groups are updated periodically.[137]

3.7.3 Residential care

3.7.3.1 Describe the use of care bands to classify care needs

Nursing homes under Medicaid in Minnesota are a package of room and board and nursing services. In order to be eligible for nursing home facility care, a Medicaid enrolee must be:

- Screened by a long-term care consultation team, and
- Determined by the team to need nursing facility-level care.

The screening team assigns each nursing facility resident 1 of 48 case mix classifications under the RUG case mix system.[138]

The Minnesota Case Mix System relies on the data collected by the federal Minimum Data Set – Version 3.0.[139]

Table 28 contains an overview of the Minnesota case mix classification system for nursing homes.

Table 28 Minnesota Case Mix System

Category (description)	ADLs score	End splits or special requirements	Minnesota RUG-IV group
Extensive Services (at least one of the following): -Tracheostomy care while a resident (O0100E2) -Ventilator or respirator while a resident (O0100F2 -Infection isolation while a resident (O0100M2) If a resident qualifies for Extensive Services but the ADLs score is ≤1, then the resident classifies as Clinically Complex.	≥2 ≥2 ≥2	-Tracheostomy care **and** ventilator/respirator -Tracheostomy care or ventilator/respirator -Infection isolation: without tracheostomy care without ventilator or respirator care	ES3 ES2 ES1
-Rehabilitation -5 days or more (15 minutes per day minimum) in any combination of speech, occupational, or physical therapy in the last 7 days [O0400A4, O0400B4, O0400C4] AND 150 minutes or greater in any combination of speech, occupational, or physical therapy in the last 7 days [O0400A1, O0400A2, O0400A3; O0400B1, O0400B2, O0400B3; O0400C1, O0400C2, O0400C3] OR -3 days or more (15 minutes per day minimum) in any combination of speech, occupational, or physical therapy in the last 7 days [O0400A4, O0400B4, O0400C4] AND 45 minutes or greater in any combination of speech, occupational, or physical therapy in the last 7 days [O0400A1, O0400A2, O0400A3; O0400B1, O0400B2, O0400B3; O0400C1,	15–16 11–14 6–10 2–5 0–1	None None None None None	RAE RAD RAC RAB RAA

Category (description)	ADLs score	End splits or special requirements	Minnesota RUG-IV group
O0400C2, O0400C3] AND at least two nursing rehabilitation services			
Special Care High (ADLs score of ≥2 and at least one of the following) -Comatose (B0100) and completely ADLs dependent or ADLs did not occur (G0100A1, G0100B1, G0100H1, G0100I1 all=4 or 8) -Septicaemia (I2100) -Diabetes (I2900) with both of the following: Insulin injections for all 7 days (N0350A=7) Insulin order changes on 2 or more days (N0350B ≥2) -Quadriplegia (I5100) with ADLs score ≥5 -Asthma or chronic obstructive pulmonary disease (I6200) AND shortness of breath while lying flat (J1100C) -Fever (J1550A) and one of the following: Pneumonia (I2000) Vomiting (J1550B) Weight loss (K0300=1 or 2) Feeding tube (K0510B1 or K0510B2) with at least 51% of total calories (K0710A3=3) OR 26–50% total calories through parenteral/enteral intake (K0710A3=2) and fluid intake is 501 cc or more per day (K0710B3=2) **K0510B1 or K0510B2 feeding tube if K0710A3 is:** 51% or more of the total calories, or 26–50% of the total calories and K0710B3 is 501 cc or more per day -Parenteral/intravenous (IV) feedings (K0510A1 or K0510A2) -Respiratory therapy for all 7 days (O0400D2=7) -If a resident qualifies for Special Care High but the ADLs score is ≤1, then the resident is classified as Clinically Complex.	15–16 15–16 11–14 11–14 6–10 6–10 2–5 2–5	Depression No depression Depression No depression Depression No depression Depression No depression	HE2 HE1 HD2 HD1 HC2 HC1 HB2 HB1
Special Care Low (ADLs score of ≥2 and at least one of the following) —Cerebral palsy (I4400) with ADLs score ≥5 —Multiple sclerosis (I5200) with ADLs score ≥5 —Parkinson's disease(I5300) with ADLs score ≥5 —Respiratory failure (I6300) and oxygen therapy while a resident (O0100C2) —Feeding tube (K0510B1 or K0510B2) with at least 51% of total calories (K0710A3=3) OR 26–50% total calories through parenteral/enteral intake (K0710A3=2) and fluid intake is 501 cc or more per day (K0710B3=2) **K0510B1 or K0510B2 feeding tube if K0710A3 is**: 51% or more of the total calories, or 26–50% of the total calories and K0710B3 is 501 cc or more per day —Two or more stage 2 pressure ulcers (M0300B1) with two or more skin treatments:** Pressure-relieving chair (M1200A) and/or bed (M1200B) Turning/repositioning (M1200C) Nutrition or hydration intervention (M1200D) Ulcer care (M1200E)	15–16 15–16 11–14 11–14 6–10 6–10 2–5 2–5	Depression No depression Depression No depression Depression No depression Depression No depression	LE2 LE1 LD2 LD1 LC2 LC1 LB2 LB1

Category (description)	ADLs score	End splits or special requirements	Minnesota RUG-IV group
Application of dressings (M1200G) Application of ointments (M1200H) —Any stage 3, 4, or unstageable (due to slough and/or eschar) pressure ulcer (M0300C1, D1, F1) with two or more skin treatments. **See above listing of skin treatments —Two or more venous/arterial ulcers (M1030) with two or more skin treatments. **See above listing of skin treatments —One stage 2 pressure ulcer (M0300B1) and one venous/arterial ulcer (M1030) with two or more skin treatments. **See above listing of skin treatments —Foot infection (M1040A), diabetic foot ulcer (M1040B), or other open lesion of foot (M1040C) with application of dressings to the feet (M1200I) —Radiation treatment while a resident (O0100B2) —Dialysis treatment while a resident (O0100J2) —If a resident qualifies for Special Care Low but the ADLs score is 0 or 1, the resident is classified as Clinically Complex.			
Clinically Complex (at least one of the following) —Pneumonia (I2000) —Hemiplegia/hemiparesis (I4900) with ADLs score ≥5 —Surgical wounds (M1040E) or open lesion (M1040D) with any selected skin treatment Surgical wound care (M1200F) Application of non-surgical dressings (M1200G) not to feet Application of ointments (M1200H) not to feet —Burns (M1040F) —Chemotherapy while a resident (O0100A2) —Oxygen therapy while a resident (O0100C2) —IV medications while a resident (O0100H2) —Transfusions while a resident (O0100I2) —If a resident qualifies for Extensive Services, Special Care High, or Special Care Low, but the ADLs score is 0 or 1, then the resident is classified as Clinically Complex, CA1, or CA2.	15–16 15–16 11–14 11–14 6–10 6–10 2–5 2–5 0–1 0–1	Depression No depression Depression No depression Depression No depression Depression No depression Depression No depression	CE2 CE1 CD2 CD1 CC2 CC1 CB2 CB1 CA2 CA1
Behavioural Symptoms and Cognitive Performance Brief Interview for Mental Status score of ≤9 AND an ADLs score of ≤5 OR Defined as 'Impaired Cognition' by the Cognitive Performance Scale AND an ADLs score of ≤5 (see description of BIMS and Cognitive Performance Scale) —Hallucinations (E0100A) —Delusions (E0100B) —Physical behavioural symptoms directed towards others (E0200A=2 or 3) —Verbal behavioural symptoms directed towards others (E0200B=2 or 3) —Other behavioural symptoms not directed towards others (E0200C=2 or 3) —Rejection of care (E0800=2 or 3) —Wandering (E0900=2 or 3)	2–5 2–5 0–1 0–1	2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs 2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs	BB2 BB1 BA2 BA1

Category (description)	ADLs score	End splits or special requirements	Minnesota RUG-IV group
Reduced Physical Function No clinical conditions	15–16 15–16 11–14 11–14 6–10 6–10 2–5 2–5 0–1 0–1	2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs 2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs 2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs 2 or more Restorative Nursing Programs 0–1 Restorative Nursing Programs	PE2 PE1 PD2 PD1 PC2 PC1 PB2 PB1 PA2 PA1
Minnesota Specific Classifications Short Stay for New Admissions with a stay of 14 days or less. Facility makes an annual election for all residents with a stay of 14 days or less. Penalty for an assessment that is not completed or submitted within 7 days of the time required by Centers for Medicare & Medicaid Services.	N/A N/A		DDF AAA

Source: Minnesota Department of Health, 2020[139]

There are four prescribed assessment times for reviewing the assigned care band of patients in Minnesota Medicaid nursing homes, as outlined in Table 29.

Table 29 Assessment schedule for nursing home care in Minnesota

Mandatory assessments used for Minnesota Case Mix System	Effective date for payment
Admission assessment: The assessment reference date* and completion date must be no later than the 14th day of the resident's stay. Admission assessments include the full minimum data set and care area assessments. Exception: facilities may opt for the short stay rate for all residents who stay 14 days or less.	Date of admission
Quarterly assessment: The assessment reference date must be no later than 92 days after the assessment reference date of the most recent mandatory assessment.	First day of the month following the assessment reference date
Annual assessment: The assessment reference date must be no later than 366 days from the assessment reference date of the most recent comprehensive assessment and no later than 92 days after the assessment reference date of the most recent mandatory assessment. An annual assessment includes the full MDS and care area assessments.	First day of the month following the assessment reference date
Significant change in status assessment: The assessment reference date and completion date must be no later than the 14th calendar day after determination that a significant change has occurred. A significant change in status assessment includes the full MDS and care area assessments and resets the schedule for both the next quarterly and annual assessments.	Assessment reference date

*The assessment reference date is the specific end point for look-back periods in the MDS assessment process. Almost all MDS items refer to the resident's status over a designated time period referring back in time from the assessment reference data. Most frequently, this look-back period, also called the observation or assessment period, is a 7-day period ending on the assessment reference date.

Source: Minnesota Department of Health, 2020[139]

This system also has an appeals process. The patient, their representative, or a member of the nursing home's staff may request a reconsideration of the assigned case mix classification.[139] The request for reconsideration must be submitted in writing to the Minnesota Department of Health within 30 days of the date of the original classification decision.

The request for reconsideration must include all of the following:

- The name of the resident
- The name and address of the facility in which the resident resides
- The reasons for the reconsideration, and
- Documentation supporting the request, including a copy of the Minimum Data Set that determined the classification, and other documents that would support or change the Minimum Data Set findings.

The review is carried out by dedicated case mix review staff.[139]

3.7.3.2 Describe the linking of care bands to service or resource allocation

As outlined in Section 3.7.3.1, the screening team assigns each resident 1 of 48 case mix classifications under the RUG case mix system. Each classification is assigned a weight which is used to calculate reimbursement rates, and nursing homes are reimbursed on a resident-per-day basis. If a resident qualifies for more than one case mix classification, the classification with the highest index or weight is the one used for payment in a process called index maximisation.[138]

Each classification is assigned a weight or index that represents the amount of care needed, and these weights are given in

Table 30. Patients receiving care in nursing facilities are required to contribute most of their income towards the cost of care, except for a personal needs allowance.

A nursing facility's rate has five components: direct care, other care, other operating costs, internal fixed costs, and property. At a minimum, there is a 15-month lag between when a facility accrues a cost and when the cost is reflected in the facility's rate. This is because nursing homes must file a cost report with the Minnesota Department of Human Services by 1 February of each year, and the Department uses these cost reports to calculate a facility's rate for the following rate year. Because of this reporting cycle, a facility's reimbursement rate will always reflect its historical costs.[138]

In addition to the Resource Utilization Groups IV (RUG-IV) case mix indices, there are two Minnesota-specific rates applied:

- Short stay rate: Nursing homes may opt to accept a short stay rate with a case mix index of 1.0 for all facility residents who stay 14 days or less in lieu of submitting an admission assessment.
- Penalty rate: The Minnesota penalty rate is the lowest facility-specific rate and is assigned for failure to complete and/or submit valid assessments within 7 days of the time frame required. The penalty rate has an index of 0.45 for RUG-IV.[139]

Table 30 Minnesota RUG-IV indices

RUG-IV group	Index	RUG-IV group	Index	RUG-IV group	Index	RUG-IV group	Index
S3	3.00	RAC	1.36	D2	1.15	BB1	0.75
S2	2.23	HD1	1.33	AB	1.1.	CA2	0.73
S1	2.22	LC2	1.3.	C2	1.08	PB2	0.70
E2	1.88	CD2	1.29	D1	1.06	CA1	0.65
D2	1.69	LE1	1.26	C1	1.02	PB1	0.65
AE	1.65	CE1	1.25	C1	0.96	BA2	0.58
E2	1.61	PE2	1.25	B1	0.95	BA1	0.53
AD	1.58	HC1	1.23	B2	0.95	PA2	0.49
C2	1.57	HB1	1.22	C2	0.91	PA1	0.45
B2	1.55	LD1	1.21	B1	0.85	Minnesota Classifications	
D2	1.54	LB2	1.21	C1	0.85		
E1	1.47	PE1	1.17	AA	0.82	AAA	0.45
E2	1.39	CD1	1.15	B2	0.81	DDF	1.00

Source: Minnesota Department of Health, 2020 [139]

4 Evaluations: Systematic review

3. What is the service user, health system, and Exchequer experience of resource allocation through care bands?

   a) Is there evidence to demonstrate that resource allocation through care bands:

      - Provides better outcomes for service users
      - At system level, supports equity of access to services across the continuum of care
      - Delivers care at the lowest level of complexity, i.e. in the community, whenever possible, and
      - Provides value for money for the Exchequer?

   b) How were the evaluations carried out? What were the main evaluation findings and what changes have been made in response to these?

4.1 Search results

A total of 65 reports from all stages of the search process met the review's inclusion criteria, including 20 Medicare Payment Advisory Commission (MedPAC) reports published between 2001 and 2020 (see Figure 12 for Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow diagram).[140]

We have treated the 20 MedPAC reports (2001–2020) as a single study from the USA reported across 20 papers in the following results sections due to the overlap in data reported across the individual reports. These reports are collectively described under the 'MedPAC reports' study identifier.

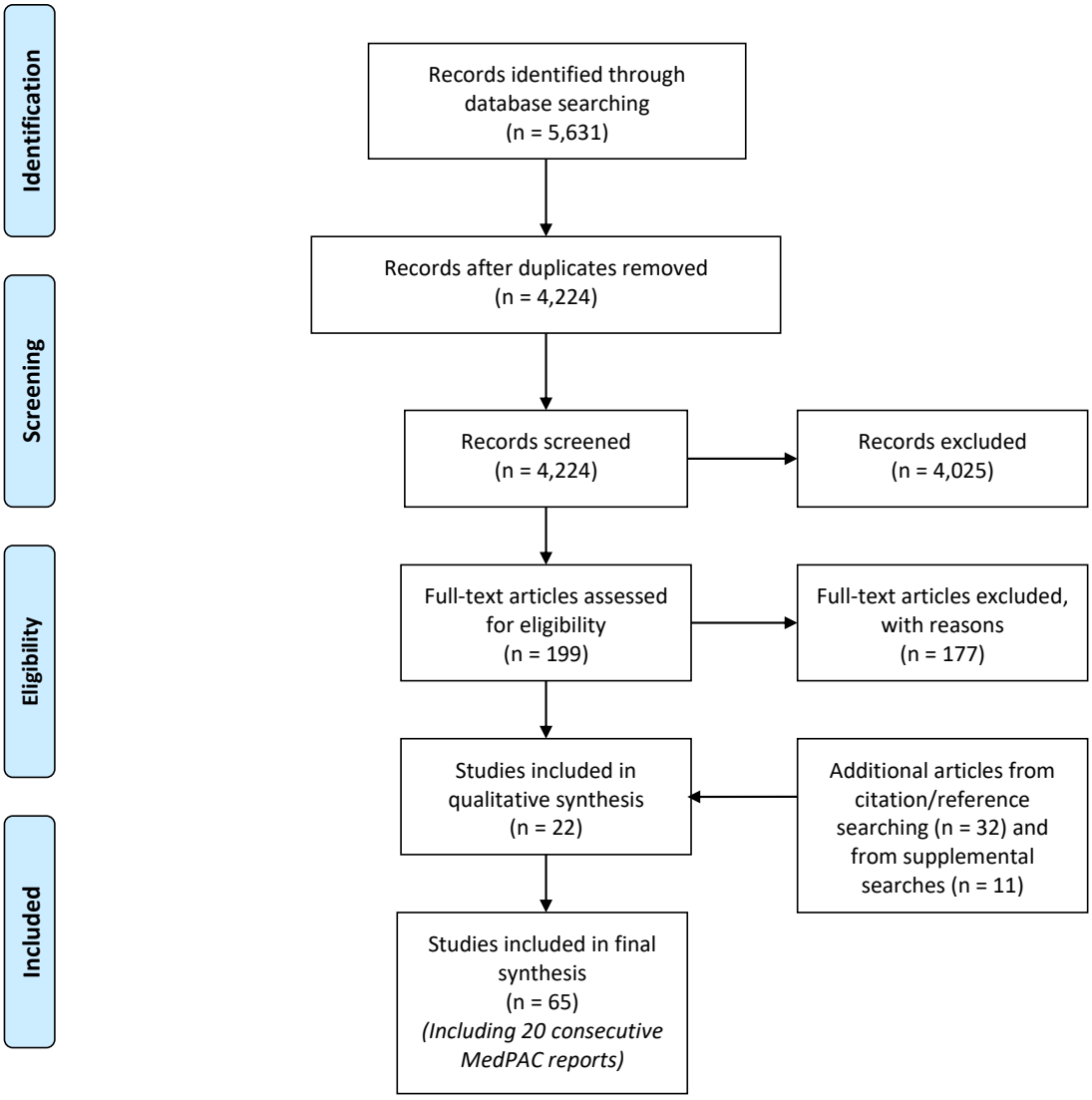

Figure 12 Preferred Reporting Items for Systematic Reviews and Meta-Analyses flow chart

4.2 Overview of included studies

The locations where studies were carried out are listed in Table 31. No studies were found for Germany.

Table 31 Locations of studies

Country	Number of studies
Australia	1
Canada	6
Germany	-
Netherlands	3
New Zealand	2
USA	34
Total	**46**

Table 32 displays a summary of the included studies, including location, study design, counterfactual (where relevant), and outcomes examined. A majority of studies included a counterfactual, often comparing outcomes under case mix reimbursement systems to outcomes in time periods or areas without case mix reimbursement. Regression and longitudinal analyses were common, with relatively fewer experimental or quasi-experimental studies. The following sections explore the evidence on the impact of resource allocation through care bands for four outcome categories: service user outcomes, equity, costs, and delivery of care at the lowest level of complexity.

Table 32 Summary of included studies

Study ID	Country	Study design	Counterfactual	Outcomes for service users	Equity	Cost-effectiveness/value/efficiency	Delivering at lowest level of complexity
Arling 2002[141]	USA	Quantitative, regression	Prior to case mix reimbursement	✓		✓	✓
Arling 2007[142]	USA	Quantitative, regression	-			✓	
Botz 1993[143]	Canada	Quantitative, cost analysis	Comparison across multiple classification systems (unweighted, RUG-III, Medicus)			✓	
Bowblis 2015[144]	USA	Quantitative, regression	Prior to price system	✓			
Bowblis 2017[145]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
Boyd 2011[146]	New Zealand	Quantitative, longitudinal, descriptive	Longitudinal data compared across 20 years	✓			✓
Cohen 1990[147]	USA	Quantitative, cross-sectional, regression	States without case mix reimbursement			✓	
Collins 2006[148]	USA	Quantitative, interview and survey	-	✓			
Davis 1998[149]	USA	Quantitative, regression	Prior to case mix reimbursement			✓	

Study ID	Country	Study design	Counterfactual	Outcomes for service users	Equity	Cost-effectiveness/value/efficiency	Delivering at lowest level of complexity
Dubuc 2011[150]	Canada	Quasi-experimental, cohort analytic	Prior to programme introduction, control condition	✓			
Duell 2017[151]	Netherlands	Quantitative, regression	Comparison across 32 care office regions		✓		
Ernst & Young 2019[86]	New Zealand	Quantitative, commissioned review	-			✓	
Feng 2006[152]	USA	Quantitative, time series, regression	States without case mix reimbursement (staggered introduction)				✓
GAO 1990[153]	USA	Quantitative, descriptive	-		✓		
GAO 2002[154]	USA	Quantitative, descriptive	-	✓			✓
Gargett 2010[155]	Australia	Quantitative, longitudinal, descriptive	Comparison across multiple systems over time				✓
Grabowski 2002[156]	USA	Quantitative, regression	States without case mix reimbursement (staggered introduction)	✓			✓
Grabowski 2004[157]	USA	Quantitative, regression	States without case mix reimbursement	✓			

Study ID	Country	Study design	Counterfactual	Outcomes for service users	Equity	Cost-effectiveness/value/efficiency	Delivering at lowest level of complexity
Hébert 2008[158]	Canada	Quasi-experimental, cohort analytic	Prior to programme introduction, control condition	✓			
Hébert 2010[159]	Canada	Quasi-experimental, cohort analytic	Prior to programme introduction, control condition	✓			
Hollander 2007[160]	Canada	Quantitative, cohort study	Comparison across home and residential care settings			✓	✓
Kenney 1990[161]	USA	Quantitative, cross-sectional, regression	States without case mix reimbursement				✓
Konetzka 2006[162]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
Latham 2008[163]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
MedPAC reports[115,164-182]	USA	Quantitative, longitudinal, descriptive	-	✓	✓	✓	✓
Mor 2011[183]	USA	Quantitative, regression	States without case mix reimbursement (staggered introduction)	✓			
Nyman 1994[184]	USA	Quantitative, regression	Prior to case mix reimbursement			✓	✓
Office of the Inspector General	USA	Quantitative, audit	Prior to case mix reimbursement			✓	

Study ID	Country	Study design	Counterfactual	Outcomes for service users	Equity	Cost-effectiveness/value/efficiency	Delivering at lowest level of complexity
and Department of Health and Human Services 1997[185]							
Office of the Inspector General and Department of Health and Human Services 2015[186]	USA	Quantitative, audit	-			✓	
Schlenker 1991[187]	USA	Quantitative, regression	States without case mix reimbursement			✓	
Schlenker 2005[114]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			✓
Schultz 1994[188]	USA	Quantitative, observational	Prior to case mix reimbursement			✓	✓
Sutherland 2013[46]	Canada	Quantitative, commissioned review	-	✓			✓
Swan 1993[189]	USA	Quantitative, regression	Prior to case mix reimbursement			✓	
Swan 2003[126]	USA	Quantitative, observational, descriptive	Prior to case mix reimbursement			✓	
Tenand 2020a[190]	Netherlands	Quantitative, cross-sectional, regression	-		✓		
Tenand 2020b[191]	Netherlands	Quantitative, cross-sectional, regression	-		✓		

Study ID	Country	Study design	Counterfactual	Outcomes for service users	Equity	Cost-effectiveness/value/efficiency	Delivering at lowest level of complexity
Teno 2008[192]	USA	Quantitative, time series, regression	States without case mix reimbursement (staggered introduction)	✓			
Thorpe 1991[193]	USA	Quantitative, pre–post, regression	Prior to case mix reimbursement				✓
Unruh 2006[194]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
Warren 2020[195]	USA	Quantitative, survey	-	✓			
White 2003[196]	USA	Quantitative, observational, descriptive	Prior to case mix reimbursement	✓			
White 2005[197]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
White 2009[198]	USA	Quantitative, regression	Prior to case mix reimbursement				✓
Wodchis 2004[199]	USA	Quantitative, regression	Prior to case mix reimbursement	✓			
Wodchis 2007[200]	USA	Quantitative, regression	States without case mix reimbursement (staggered introduction)	✓			

4.3 Quality assessment

We used the Effective Public Healthcare Panacea Project's Quality Assessment Tool for Quantitative Studies to critically appraise the included studies.[9]

A summary of the critical appraisal of included studies is reported in Table 33.

Only one of the studies had a strong rating. Twenty were considered weak and twenty-five were considered of moderate quality. The studies were appraised as being particularly weak in study design with 41/46 considered weak on this criterion.

We did not apply the withdrawals and drop-outs criterion to the majority of studies, as it was not appropriate for the study design in question, e.g. studies based on registry data.

Table 33 Summary critical appraisal

Study ID	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and drop-outs	Global rating
Arling 2002	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Arling 2007	Weak	Weak	Strong	Weak	Weak	Not applicable	Weak
Botz 1993	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Bowblis 2015	Strong	Moderate	Strong	Moderate	Strong	Not applicable	Strong
Bowblis 2017	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Boyd 2011	Moderate	Weak	Weak	Moderate	Strong	Not applicable	Weak
Cohen 1990	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Collins 2006	Weak	Weak	Not applicable	Weak	Strong	Not applicable	Weak
Davis 1998	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Dubuc 2011	Weak	Moderate	Strong	Weak	Moderate	Weak	Weak
Duell 2017	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Feng 2006	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
GAO 1990	Weak	Weak	Weak	Weak	Weak	Not applicable	Weak
GAO 2002	Strong	Weak	Not applicable	Moderate	Strong	Not applicable	Moderate
Gargett 2010	Strong	Weak	Weak	Moderate	Weak	Not applicable	Weak
Grabowski 2002	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Grabowski 2004	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate

Study ID	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and drop-outs	Global rating
Hebert 2008	Weak	Moderate	Strong	Weak	Moderate	Moderate	Weak
Hebert 2010	Weak	Moderate	Weak	Weak	Moderate	Strong	Weak
Hollander 2007	Strong	Moderate	Weak	Moderate	Strong	Not applicable	Moderate
Kenny 1990	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Konetzka 2006	Strong	Weak	Weak	Moderate	Strong	Not applicable	Weak
Latham 2008	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
MedPAC reports	Weak	Weak	Weak	Weak	Weak	Not applicable	Weak
Mor 2011	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Ernst & Young 2019[86]	Weak	Weak	Weak	Weak	Weak	Not applicable	Weak
Nyman 1994	Strong	Weak	Strong	Moderate	Strong	Not applicable	Weak
Office of the Inspector General and Department of Health and Human Services 1997	Weak	Weak	Weak	Weak	Weak	Not applicable	Weak
Office of the Inspector General and Department of Health and Human Services 2015	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Schlenker 1991	Weak	Weak	Strong	Moderate	Strong	Not applicable	Weak
Schlenker 2005	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Schultz 1994	Strong	Weak	Weak	Moderate	Strong	Not applicable	Weak

Study ID	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and drop-outs	Global rating
Sutherland 2013	Weak	Weak	Weak	Weak	Weak	Not applicable	Weak
Swan 1993	Weak	Weak	Weak	Weak	Strong	Not applicable	Weak
Swan 2003	Strong	Weak	Weak	Moderate	Strong	Not applicable	Weak
Tenand 2020a equal	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Tenand 2020b eligibility	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Teno 2008	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Thorpe 1991	Strong	Weak	Moderate	Moderate	Strong	Not applicable	Moderate
Unruh 2006	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Warren 2020	Weak	Weak	Not applicable	Weak	Weak	Not applicable	Weak
White 2003	Strong	Weak	Weak	Moderate	Strong	Not applicable	Weak
White 2005	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
White 2009	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Wodchis 2004	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate
Wodchis 2007	Strong	Weak	Strong	Moderate	Strong	Not applicable	Moderate

4.4 Outcomes for service users

Is there evidence to demonstrate that resource allocation through care bands provides better outcomes for service users?

Twenty-four studies examined the impact of resource allocation through care bands on outcomes for service users. Of these, 19 were conducted in the USA, 4 in Canada, and 1 in New Zealand.

One study from the USA comprised data from reports from MedPAC, an independent congressional agency that advises the United States Congress on issues relating to the Medicare programme.[115,164-182] MedPAC publishes two annual reports containing recommendations and analysis on access to care, quality of care, and other issues affecting Medicare. These data are longitudinal and descriptive; formal statistical tests for change over time were not conducted.

The following analysis is organised according to six sub-outcomes for service users: service user health outcomes, utilisation, satisfaction and empowerment, quality of care practices/processes, provision of therapy, and pressure to change clinical practices in response to new financial incentives.

4.4.1 Service user health outcomes

Fifteen studies reported on a wide range of health outcomes for service users, such as changes in needs related to ADLs and adverse events (such as falls and pressure ulcers). Of these, 11 were from the USA, 3 were from Canada, and 1 was from New Zealand.

4.4.1.1 Home care

Two studies examined data on the introduction of the Medicare PPS for home health in 2000. The evidence is generally positive, suggesting that the introduction of case mix reimbursement does not negatively impact on health outcomes, particularly ADLs, in the home health setting.

One study[163] presented an analysis of cross-sectional data from 1995 (prior to the system), 1999 (system in place with therapy caps), and 2001 (system in place without therapy caps) from Medicare Current Beneficiary Surveys for patients with at least one of five diseases or conditions: acute stroke, acute myocardial infarction, chronic obstructive pulmonary disease, arthritis and degenerative joint disease, and mobility impairment. Deaths and self-rated poor/fair health remained stable across all settings in the study (skilled nursing facilities, home health, and inpatient and outpatient rehabilitation) across the three time points, while limitations in ADLs saw significant reductions in the home health setting (from 2.7 ±0.11 in 1995 to 2.1 ±0.09 in 2001).

A second study[114] presented data from a national random sample of Medicare home health beneficiaries from 1999 to 2000 (before the PPS) and 2001 (after the PPS). A range of service user health outcomes were examined, including improvement or stabilisation in ADLs (grooming, dressing upper and lower body, bathing, toileting, transferring, ambulation/locomotion, and eating); improvement or stabilisation in instrumental activities of daily living (IADLs) (light meal preparation, laundry, housekeeping, shopping, telephone use, and management of oral medications); speech or language; pain interfering with activity; number and status of surgical wounds; dyspnea; urinary tract infection; urinary incontinence; cognitive functioning; confusion frequency; anxiety level; and behavioural problem frequency, along with utilisation and other measures. Regression analysis (see Appendix E) indicated that the introduction of the PPS was associated with fewer visits per episode but relatively few changes in outcomes, suggesting greater efficiency. A majority of scores for improvement and stabilisation in ADLs (except bathing, transferring, and walking) were significantly more favourable in the PPS period, although the evidence for improvement in IADLs was more mixed, with improvement only in shopping (increased) and telephone use (decreased). Unadjusted scores for improvement in number and status of surgical wounds and adjusted scores for improvement in urinary incontinence and confusion frequency showed decreases under the PPS, although unadjusted scores showed stabilisation and improvement in cognitive functioning and anxiety levels, as well as improvement in behavioural problem frequency.

In addition to the two studies above, data were available from the MedPAC reports.[115,164-182] An increasing percentage of service users experienced improvements in transferring (51–77%) and walking (37 –77%) between 2004 and 2018, and in bathing (56–63%) between 2004 and 2013. An increasing percentage of service users also experienced improvements between 2004 and 2010 in medication management (37–43%) and pain management (59–64%). As mentioned above, these data are longitudinal and descriptive; formal statistical tests for change over time were not conducted.

4.4.1.2 Residential care

Studies in residential care reported on a range of service user health outcomes, with mixed findings. In general, changes to the Medicaid payment system in the USA had less impact than changes to Medicare, for which a variety of positive, negative, and neutral impacts were reported.

4.4.1.2.1 Medicare PPS

Four studies focused on the introduction of the Medicare PPS for skilled nursing facilities (SNFs) in 1998. The four studies reported on a wide variety of outcomes with little overlap, and so each is described separately below. The evidence regarding the impact of the PPS was very mixed; studies reported differing findings around incidence of pressure ulcers, and individual studies reported mixed findings for incidence of urinary tract infections, deaths, self-rated health, and limitations in ADLs.

One study[162] presented an analysis of panel data for SNFs between 1995 and 2000 in order to examine the impact of the Medicare PPS on the incidence of urinary tract infections and pressure ulcers as indicators of quality of care. Regression analysis (see Appendix E) indicated that the probability of developing a urinary tract infection or pressure ulcer increased significantly following the introduction of the PPS, likely due to decreases in nurse staffing. The effect was roughly proportional to a facility's share of residents funded by Medicare. The authors note that Medicare is a relatively small source of revenue for SNFs, with most long-stay residents being funded by Medicaid. However, the changes to Medicare funding were felt on a wide scale, as Medicare margins are often used to subsidise lower Medicaid margins.

One study[163] presented an analysis of cross-sectional data from 1995 (prior to the system), 1999 (system in place with therapy caps), and 2001 (system in place without therapy caps) from Medicare Current Beneficiary Surveys for patients with at least one of five diseases or conditions: acute stroke, acute myocardial infarction, chronic obstructive pulmonary disease, arthritis and degenerative joint disease, and mobility impairment. Deaths and self-rated poor/fair health remained stable across all settings in the study (SNFs, home health, and inpatient and outpatient rehabilitation) across the three time points, while limitations in ADLs saw significant reductions in the SNF setting (from 3.02 ±0.15 in 1995 to 2.60 ±0.11 in 2001).

Unruh *et al.*[194] analysed data from SNFs between 1997 and 2003 in order to examine the impact of three legislative changes: the Balanced Budget Act of 1997, which initiated the Medicare PPS; the Balanced Budget Refinement Act of 1999, which increased baseline Medicare payments; and the Benefits Improvement and Protection Act of 2000, which further increased payment amounts – in particular, the nursing component – in order to avoid deleterious effects on staffing from overall payment reductions. The study used a composite measure of quality, comprising facility self-reports of the presence of indwelling catheters, pressure ulcers, and physical restraints. Regression analysis (see Appendix E) indicated a negative impact of the Balanced Budget Act of 1997 (introduction of the Medicare PPS) and a positive impact of the latter two Acts. However, other factors also had a significant negative impact on quality, including higher resident acuity, higher facility percentage of Medicaid residents, larger facility size, and higher per capita income. Importantly, the presence of a higher percentage of Medicaid residents mitigated the negative effects on quality of the Balanced Budget Act of 1997.

Finally, White[197] presented an analysis of data from free-standing SNFs between 1997 and 2001, before and after the introduction of the Medicare PPS in 1998. The Medicare resident fraction (the proportion of residents in a given facility with Medicare as the primary payer) was used to measure the exposure of facilities to change in the new PPS in 1997. In regression analysis, this exposure was not associated with any change in the prevalence of pressure ulcers (see Appendix E).

In addition to the four studies above, data were available from the MedPAC reports.[115,164-182] Between 2011 and 2018, the risk-adjusted rate of no decline in mobility ADLs was very stable, at approximately 87%. The risk-adjusted rate of improvement in mobility ADLs was also stable during this time (range: 43.5–44.0%).

4.4.1.2.2 Medicaid prospective case mix adjusted payment

Five studies reported on the impact of the introduction of case mix-adjusted reimbursement for Medicaid-funded patients in residential care, which was adopted at various times in different states during the 1990s and 2000s. As mentioned above, a wide range of service user health outcomes were examined, the most common of which are summarised in Table 34. These studies found a good degree of stabilisation, such that the introduction of case mix-adjusted payments had little impact on

health outcomes, with one study reporting improvements in the incidence of incontinence and urinary tract infections. The studies are described in more detail below.

Table 34 Summary of service user health outcomes under Medicaid prospective case mix-adjusted payment

	Bowblis 2015[144]	Bowblis 2017[145]	Grabowski 2002[156]	Grabowski 2004[157]	Mor 2011[183]
Pressure ulcers	No change	No change	No change	No change	No change
Pain	No change	No change	-	Reduced incidence	No change
Incontinence	No change	Reduced incidence	-	-	-
Urinary tract infection	No change	Reduced incidence	-	-	-
Falls with major injury	-	No change	-	-	-
Functional decline	-	No change	-	-	No change

One study analysed data from Medicaid-reimbursed nursing facilities in Ohio between 2007 and 2012[144] in order to examine the impact of the phasing in of a new price reimbursement system, largely based on case mix, which was introduced in 2006. The analysis compared changes in facility-acquired pressure ulcers and contractures across four groups of nursing homes, delineated by whether they anticipated little change, increases, or decreases in reimbursement under full implementation of the new price system. The prevalence of facility-acquired contractures declined for all groups over the study period, while the prevalence of facility-acquired pressure ulcers remained stable (see Appendix E). The authors suggest that reserve funds may have been used to mitigate the effects of the new price structure.

A similar study[145] analysed data from Medicaid-reimbursed nursing homes in Ohio in 2006 and 2010. The analysis compared changes in a number of metrics, including moderate to severe pain, decline in physical functioning, bowel/bladder incontinence, urinary tract infection, pressure ulcers (low- and high-risk residents), and falls with major injury across three groups of nursing homes, delineated by whether they anticipated no change, increases, or decreases in reimbursement under full implementation of the new price system. Regression analysis found that the measures in facilities anticipating some level of change in reimbursement did not generally change over the study period relative to the no-change group (see Appendix E). Facilities anticipating increased reimbursement saw fewer residents with incontinence (by 2.4 percentage points). The authors suggest that reductions in Medicare reimbursement rates may be an effective tool to reduce costs without negatively impacting on quality of care.

Two studies by Grabowski explored the impact of case mix Medicaid payment systems on the prevalence of pressure ulcers. The first study[156] was a regression analysis of panel data for all USA nursing homes from 1991 to 1998; by 1998, Medicaid programmes in 26 states had adopted case mix reimbursement methods. The second study,[157] Medicaid Payment And Risk-Adjusted Nursing Home Quality Measures, presented an analysis of resident assessments from the second quarter of 1999 in order to examine the impact of variation in Medicaid payment rates on a variety of quality measures, controlling for the use of case mix Medicaid payment systems. Neither study found an association between case mix reimbursement and the prevalence of pressure ulcers, although the second study found an association with reduced prevalence of pain (see Appendix E).

A longitudinal study[183] of free-standing nursing homes from 1999 to 2005 explored the effect of changes in Medicaid reimbursement on clinical outcomes for residents in long-term care. States adopted case mix reimbursement policies at different times during this period. Case mix reimbursement was not associated with changes in health outcomes, although greater overall state

spending was associated with measurable improvements in all three health outcomes measured: functional decline (defined as a change of at least 4 points on a 28-point ADLs scale), pressure ulcer incidence, and persistent pain (see Appendix E).

4.4.1.2.3 New Zealand classification system 2001

One study[146] analysed data from aged residential care in New Zealand at four time points across a 20-year period: 1988, 1993, 1998, and 2008. The study measured changes in dependency and functional indicators covering self-care, mobility, continence, memory loss, confusion, behaviour, and communication. Increased resident global dependency was observed over the study period, with increased dependency across all functional indicators. There were significant increases in dependency for continence, mobility, self-care, and orientation, but no significant changes in memory or behaviour. Dependency in self-care remained unchanged between 1998 and 2008, along with most indicators of cognitive function, while a substantial decrease in the proportion of residents requiring feeding assistance was observed over the same time period. It is important to note that while the period of study covers the introduction of a four-level care band system for reimbursement in 2001, the analysis does not directly examine the impact of this change; rather, analysis is focused on the change across the entire period. These changes over time cannot be directly attributed to the introduction of the care band system.

4.4.1.3 Residential and home care

Three studies reported on a quasi-experimental design to examine the impact of an integrated service delivery system – the Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA) – across residential and home care in Quebec, Canada using pre-test and multiple post-test measures of outcomes, along with a comparison group. The new system included a case mix management system and was generally found to have positive impacts on health outcomes, including functional decline and unmet needs.

The first study[158] reported on the first year of implementation, finding that the control group experienced a greater decline in cognitive functioning that was statistically (but not clinically) significant. However, the study authors caution that implementation was very low in this first year of the study (less than 33%) and recommend that it be regarded as a baseline year only for this reason.

The second study of the same system[159] examined its impact in the last 2 years of its 4-year implementation. Analysis indicated that, compared with usual care, the PRISMA integrated service delivery model resulted in reduced prevalence and annual incidence rates of functional decline. Implementation in the experimental group was greater than 70%.

The third study of the same system[150] used the Functional Autonomy Measurement System as a primary measure of disability, as well as needs and unmet needs for a range of ADLs, IADLs, and indicators for mobility, communication, and mental functions. Integrated service delivery was associated with a steeper decrease in unmet needs over time, along with reduced prevalence and incidence of functional decline. A higher level of empowerment among the experimental group at baseline was highlighted as a protective factor.

4.4.2 Utilisation

Seven studies (four from the USA and three from Canada) explored the impact of case mix reimbursement on utilisation outcomes, including hospitalisations, use of emergency care, number of visits per episode, and use of voluntary and other services. While the studies were distributed across a variety of settings and payment systems, a general trend of reduction or stabilisation in utilisation measures under case mix reimbursement was observed.

4.4.2.1 Home care

One study[114] presented an analysis of data from a national random sample of Medicare home health beneficiaries in order to examine the effect of the introduction of the Medicare home health PPS in 2000. The study examined data from 1999 to 2000 (before the PPS) and 2001 (after the PPS) on the number of visits per episode, acute care hospitalisation, discharge to community, and emergent care. Regression analysis (see Appendix E) indicated that the introduction of the PPS led to fewer visits per

episode and lower rates of hospitalisation and emergent care use. Rates of discharge to community also improved (increased) under the PPS.

Data were also available from the MedPAC reports.[115,164-182] The number of home health visits per episode showed some change over time. Therapy visits per episode increased (from 3.8 in 1998 to 8.0 in 2018), while total visits (therapy, skilled nursing, home health aide, medical social services) saw notable reductions (from 31.6 in 1998 to 17.8 in 2018). Hospitalisations fell between 2004 and 2010 (range: 28–29%) and between 2014 and 2018 (range: 15–16%). The same pattern was observed in use of emergency care (2004–2010 range: 21–22%; 2014–2018 range: 12% to 12%).

4.4.2.2 Residential care

4.4.2.2.1 Medicaid case mix reimbursement

One study[141] examined annual hospitalisation rates for residents of nursing homes in Mississippi and South Dakota before and after the introduction of Medicaid case mix reimbursement in 1993. Annual hospitalisation rates increased significantly in both states following the introduction of case mix reimbursement (from 37 to 67 per 100 residents in Mississippi and from 27 to 39 per 100 residents in South Dakota). This was accompanied by significant increases in case mix scores for facilities, leading the study authors to suggest that nursing homes were unprepared to care for higher-acuity residents who were admitted in greater numbers in response to financial incentives under the new system. When nursing homes could not meet the needs of these patients, they observed increased numbers of hospitalisations.

4.4.2.2.2 Medicare PPS

One study[163] examined rates of acute care hospitalisations before and after the Balanced Budget Act of 1997, which initiated the PPS for Medicare. Cross-sectional data from the Medicare Current Beneficiary Surveys from 1995 (prior to the system), 1999 (interim payment system), and 2001 (PPS) were analysed for patients with at least one of five diseases or conditions: acute stroke, acute myocardial infarction, chronic obstructive pulmonary disease, arthritis and degenerative joint disease, and mobility impairment. Rates of acute care hospitalisations remained stable across the three time points.

Data were also available from the MedPAC reports.[115,164-182] There was an overall pattern of improving risk-adjusted rates of discharge to the community (from 33.5% in 2011 to 41.4% in 2018). Between 2011 and 2018, generally stable rates of potentially avoidable rehospitalisation during a stay (range: 10.4–12.4%) and within 30 days of a stay (range: 5.0–6.1%) were observed.

4.4.2.2.3 Alberta Health Services Patient/Care-Based Funding Model

One report[46] drew on a variety of data to describe the Alberta Health Services Patient/Care-Based Funding Model for long-term residential care and makes a number of recommendations. Scatterplot analysis revealed that the facility case mix index was independent of the rate of inpatient admissions. The case mix index was not associated with the rate of visits to the emergency department.

4.4.2.3 Residential and home care

Two studies reported using a quasi-experimental design to examine the impact of the PRISMA integrated service delivery system across residential and home care in Quebec, Canada using pre-test and multiple post-test measures of outcomes, along with a comparison group. The new system included a case mix management system. The first study[158] reported on the first year of implementation, finding that participants in the experimental group more frequently availed of emergency department visits, health professionals, voluntary services, home help for personal care, and day care. However, the study authors caution that implementation was very low in this first year of the study (less than 33%) and recommend that it be regarded as a baseline year only for this reason.

The second study of the same system[159] examined its impact in the last 2 years of its 4-year implementation. Rates of emergency department visits and hospitalisations stabilised in study areas,

whereas rates of hospitalisations increased in control areas. Implementation in the experimental group was greater than 70%.

4.4.3 Satisfaction and empowerment

Findings from four studies indicated that, while there is some evidence for a secular trend of declining satisfaction over time, case mix reimbursement does not seem to substantially impact on satisfaction and empowerment.

4.4.3.1 Residential care

Two studies analysed data from Medicaid-reimbursed nursing facilities in Ohio in order to examine the impact of the phasing in of a new price reimbursement system, largely based on case mix, which was introduced in 2006. Both studies[144,145] compared changes in resident and family satisfaction across groups of nursing homes in Ohio, delineated by how much change in reimbursement, if any, they anticipated under full implementation of the new price system.

Findings across the two studies were mixed. The analysis in the first study[144] compared changes across four groups of nursing homes from 2007 to 2012. Resident satisfaction was stable across the study period, irrespective of anticipated changes in reimbursement. Family satisfaction declined over the time period for all groups apart from those with an actual reimbursement rate at least 15% above the baseline 2007 rate (see Appendix E, Table 78). The authors suggest that reserve funds may have been used to mitigate the effects of the new price structure.

The second study[145] compared changes between 2006 and 2010 across three groups of Ohio nursing homes, delineated by whether they anticipated no change, increases, or decreases in reimbursement under full implementation of the new price system. Regression analysis found that family satisfaction was stable and resident satisfaction declined over time, but not differentially for different groups of homes (see Appendix E, Table 79).

4.4.3.2 Residential and home care

Two studies reported using a quasi-experimental design to examine the impact of the PRISMA integrated service delivery system across residential and home care in Quebec, Canada using pre-test and multiple post-test measures of outcomes, along with a comparison group. The new system included a case mix management system. The first study[158] reported on the first year of implementation, finding that neither patient satisfaction with health services nor patient empowerment showed significant differences or changes between the experimental and control groups. However, the study authors caution that implementation was very low in this first year of the study (less than 33%) and recommend that it be regarded as a baseline year only for this reason.

The second study of the same system[159] examined its impact in the last 2 years of its 4-year implementation. Patient satisfaction significantly increased in the experimental group (+13.9%), while it remained stable in the control group (−3%). Patient empowerment remained stable in the experimental group (−1%), while it declined in the control group (−11.7%). Implementation in the experimental group was greater than 70%.

4.4.4 Quality of care practices/processes (catheters, restraints, feeding tubes, deficiencies)

Eight studies from the USA examined the impact of case mix reimbursement on a range of process measures of quality of care in residential settings, focusing on the use of particular care practices, including: use of catheters, physical restraints, and feeding tubes; the adequacy of pain management; and the presence of deficiencies, defined as violations of standards of care as reported by state inspectors. Some service user health outcomes, such as the prevalence of pressure ulcers, may also be considered proxy indicators of quality of care (see Section 4.4.1).

Table 35 displays a summary of the most common care practices/processes across the eight studies. A good deal of stability was observed, such that the introduction of case mix reimbursement had little impact on outcomes, with some improvement in use of feeding tubes and pain management. However, the evidence around use of physical restraints is very mixed.

Table 35 Summary of care practices/processes outcomes under Medicare and Medicaid prospective case mix adjusted payment systems

	Medicare		Medicaid					
	Unruh 2006[194]	White 2005[197]	Bowblis 2015[144]	Bowblis 2017[145]	Grabowski 2002[156]	Grabowski 2004[157]	Mor 2011[183]	Teno 2008[192]
Care deficiencies	-	Increased frequency	No change	No change	No change	-	-	-
Catheters	Mixed effects	-	No change	Increased frequency	No change	-	-	-
Feeding tubes	-	-	No change	-	No change	-	-	Decreased frequency
Pain management	-	-	-	No change	-	Improved	-	-
Physical restraints	Mixed effects	No change	Decreased frequency	No change	Increased frequency	Decreased frequency	No change	-

4.4.4.1 Residential care

4.4.4.1.1 Medicare PPS

Unruh *et al.*[194] analysed data from SNFs between 1997 and 2003 in order to examine the impact of three legislative changes: the Balanced Budget Act of 1997, which initiated the Medicare PPS; the Balanced Budget Refinement Act of 1999, which increased baseline Medicare payments; and the Benefits Improvement and Protection Act of 2000, which further increased payment amounts – in particular, the nursing component – in order to avoid deleterious effects on staffing from overall payment reductions. The study used a composite measure of quality, comprising facility self-reports of the presence of indwelling catheters, pressure ulcers, and physical restraints. Regression analysis (see Appendix E) indicated a negative impact of the Balanced Budget Act of 1997 (introduction of the Medicare PPS) and a positive impact of the latter two Acts. However, other factors also had a significant negative impact on quality, including higher resident acuity, higher facility percentage of Medicaid residents, larger facility size, and higher per capita income. Importantly, the presence of a higher percentage of Medicaid residents mitigated the negative effects on quality of the Balanced Budget Act of 1997.

White[197] presented an analysis of data from free-standing SNFs between 1997 and 2001, before and after the introduction of the Medicare PPS in 1998. The Medicare resident fraction (the proportion of residents in a given facility with Medicare as the primary payer) was used to measure the exposure of facilities to change in the new PPS in 1997. In regression analysis, this exposure was associated with a significant increase in the number of deficiencies (violations of standards of care as reported by state inspectors), but not with any change in the prevalence of use of restraints for patients who did not have orders for restraints at the time of admission (see Appendix E).

4.4.4.1.2 Medicaid prospective case mix adjusted payment

One study analysed data from Medicaid-reimbursed nursing facilities in Ohio between 2007 and 2012[144] in order to examine the impact of the phasing in of a new price reimbursement system, largely based on case mix, which was introduced in 2006. The analysis compared changes in deficiencies, facility-acquired catheters and restraints, and use of feeding tubes across four groups of nursing homes, delineated by whether they anticipated little change, increases, or decreases in reimbursement under full implementation of the new price system. The new price system led to changes in staffing levels, but few significant changes in quality. The prevalence of deficiencies, facility-acquired catheters, and use of feeding tubes showed no change for any of the groups, while the prevalence of facility-acquired restraints declined over time for all groups (see Appendix E). The authors suggest that reserve funds may have been used to mitigate the effects of the new price structure.

A similar study[145] analysed data from Medicaid-reimbursed nursing homes in Ohio in 2006 and 2010. The analysis compared changes in the use of catheters, the use of physical restraints, total facility-level deficiencies, quality-of-care deficiencies, quality-of-life deficiencies, and administrative/other deficiencies across three groups of nursing homes, delineated by whether they anticipated no change, increases, or decreases in reimbursement under full implementation of the new price system. Regression analysis found that these quality measures in facilities anticipating some level of change in reimbursement did not generally change over the study period relative to the no-change group (see Appendix E). The changes did have an impact on staffing levels, such that increased and decreased funding were associated with corresponding changes in staffing levels. The authors suggest that reductions in Medicare reimbursement rates may be an effective tool to reduce costs without negatively impacting on quality of care.

One study[156] presented an analysis of panel data for all USA nursing homes from 1991 to 1998 in order to examine the impact of a case mix-based payment system. By 1998, Medicaid programmes in 26 states had adopted case mix reimbursement methods. The study examined process measures of quality of care: the proportion of residents with bedsores (pressure ulcers), restraints, catheters, and

feeding tubes, as well as staffing levels and dependency. Regression analysis (see Appendix E) indicated that case mix reimbursement did not generally negatively impact these measures of quality of care, although there was a statistically significant effect on the use of physical restraints (which increased by 0.7 percentage points, or 4%).

A study by Grabowski *et al.*[157] presented an analysis of resident assessments from the second quarter of 1999 in order to examine the impact of variations in Medicaid payment rates on a variety of quality measures, controlling for the use of case mix Medicaid payment systems. Regression analysis (see Appendix E) indicated that both higher levels of Medicaid payments and the use of case mix payment systems were associated with lower predicted rates of physical restraint use. The case mix payment system was also associated with lower predicted rates of inadequate pain management.

A longitudinal study[183] of free-standing nursing homes from 1999 to 2005 explored the effect of changes in Medicaid reimbursement on clinical outcomes for residents in long-term care. States adopted case mix reimbursement policies at different times during this period. Case mix reimbursement was not associated with changes in the use of physical restraints.

Finally, Teno *et al.*[192] presented a 2008 secondary analysis of longitudinal data on the use of feeding tubes among nursing home residents in 48 states from 1993 to 2004, during which time 16 states adopted Medicaid RUG-based case mix reimbursement. Regression analysis (see Appendix E) revealed a secular trend of increased average prevalence of feeding tubes over time (average increase of 2% between 1993 and 2000), while the introduction of case mix reimbursement was associated with a slight but significant decrease in average prevalence.

4.4.5 Provision of therapy

Evidence from five studies from the USA suggests that case mix reimbursement incentivises more equitable access to therapy, such that increased numbers of patients receive some moderate amount of therapy.

4.4.5.1 Home care

One study examined the impact of the introduction of the Medicare PPS for home health on the provision of physical and occupational therapy.[163] Cross-sectional data from the Medicare Current Beneficiary Surveys from 1995 (prior to the system), 1999 (interim payment system), and 2001 (PPS) were analysed for patients with at least one of five diseases or conditions: acute stroke, acute myocardial infarction, chronic obstructive pulmonary disease, arthritis and degenerative joint disease, and mobility impairment. The likelihood of a service user receiving therapy from a home health agency did not change during the study period, but mean total therapy time increased significantly from 1995 to 2001 (see Appendix E).

4.4.5.2 Residential care

Five studies, all from the USA, examined the effect of case mix reimbursement on the provision of therapy in SNFs.

4.4.5.2.1 Medicare PPS

Four studies focused on the introduction of the Medicare PPS for SNFs in 1998.

Of these four studies, three examined the impact of the new system on total therapy time provided; two studies found a reduction in total therapy time,[154,199] while one[163] found an increase.

Two studies observed a change in assessment practices, such that more patients were classified into high and medium rehabilitation group categories and fewer into very high- and very low-intensity payment groups.[154,196] The remaining two studies found that the introduction of the new system was associated with a greater likelihood of residents receiving therapy[163] and more residents being identified as needing therapy.[199] This pattern suggests that the Medicare PPS encouraged more balanced access to therapy services in SNFs across the spectrum of need, with more patients having access to some moderate amount of therapy.

A study by White[196] observed substantial reductions in the proportion of residents receiving very high levels of rehabilitation therapy (>US$200/day) following the introduction of the PPS. In non-profit facilities, this proportion fell from 10.6% in 1997 to 1.8% in 2000. However, the change was even more pronounced in for-profit facilities (from 19.0% in 1997 to 1.6% in 2000) and in particular for free-standing for-profit facilities (see Figure 13). The authors offer two possible reasons for the concentration of very high use of therapy in for-profit standalone facilities and the subsequent changes: first, that the very high levels of therapy provided before the implementation of the PPS were motivated primarily by profit rather than clinical utility, and that clinically superfluous therapy provision was eliminated in response to new financial incentives under the PPS; and second, that the new system encouraged the relocation of residents with very intensive therapy needs to other settings, such as rehabilitation hospitals.

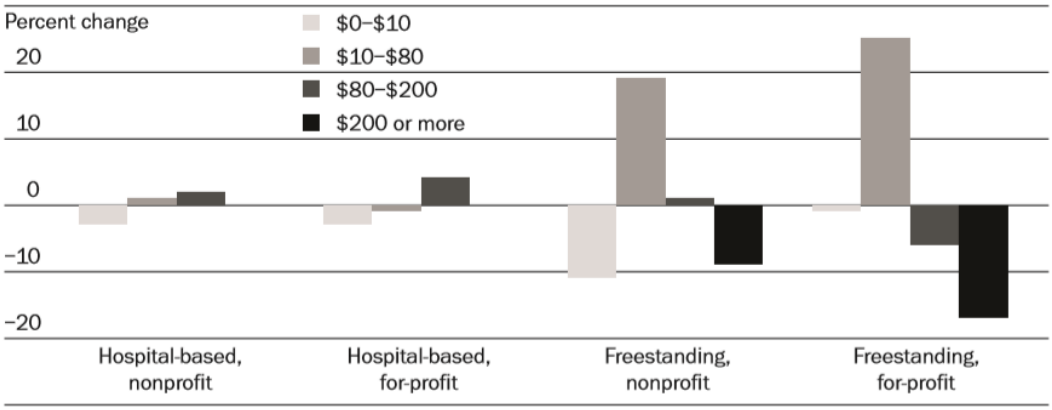

Figure 13: Change in percentage of SNF residents receiving various levels of rehabilitation therapy per day, stratified by facility type, 1997–2000

Source: White, 2003[196]

4.4.5.2.2 Medicaid prospective case mix adjusted payment

One study[200] analysed data on Medicaid nursing home residents in six states from 1992 to 1995, during which time the states transitioned at different times to prospective case mix-adjusted payment methods. The change from prospective facility-specific payment systems to prospective case mix-adjusted payment was strongly associated with increased use of therapy, both in terms of therapy minutes provided and the probability of a resident receiving therapy (see Appendix E).

4.4.6 Pressure to change clinical care practices in response to new financial incentives

Two studies of allied health professionals in the USA offered some evidence that financial incentives under case mix reimbursement impact to some extent on clinical care practices and treatment decisions.

Under the Medicare PPS for SNFs, introduced in 1998, a therapy threshold was introduced, which was set at 10 home health visits for physical, occupational, or speech therapy; the reimbursement rate remained the same when the patient received 10 or more visits. In an interview study[148] with 26 therapists and 8 therapy managers, a significant proportion of therapists (73.0%) and a non-significant majority (62.5%) of therapy managers agreed that the therapy threshold affects practice and patterns of therapy provision. Therapy managers (87.5%) generally believed that the threshold introduced an ethical dilemma, particularly at the level of eight visits (two short of the threshold). Therapists reported feeling pulled between serving the patients' needs and the financial needs of the agency. However, neither group believed that the therapy threshold impacted quality of care.

Another study, a survey of approximately 4,500 speech-language pathologists in the USA,[195] found that approximately 35% and 42% of respondents were required to conduct concurrent or group therapy, respectively, in SNFs, regardless of their clinical judgement, following introduction of the Patient-Driven Payment Model in 2019. Under the previous reimbursement system (RUG case mix), inappropriate use of group therapy was specifically discouraged by restricting its use, such that the total treatment time was divided among four patients for billing purposes. Under this system, less than 1% of therapy was delivered in group or concurrent settings, which was not in line with best practice and was interpreted as a response to the financial incentives to encourage individual therapy. Group and concurrent therapy settings are more financially attractive under the Patient-Driven Payment Model, which imposes a 25% cap on combined group and concurrent therapy per patient; clinicians therefore have a financial incentive to reach this cap with each patient. Sixty-nine per cent of survey respondents reported experiencing ethical pressure to alter the frequency, intensity, or duration of treatment or timing of discharge, arising from mandates under the Patient-Driven Payment Model.

4.5 Equity

Is there evidence to demonstrate that resource allocation through care bands, at system level, supports equity of access to services across the continuum of care?

We identified five studies reporting on this outcome. Three were from the Netherlands, and two were from the USA.

Tenand and colleagues conducted two studies on equity in the Netherlands' long-term care system.[190,191] The studies focused on the system in operation in 2012, before the introduction of the current system described in Section 3.5. However, the system in 2012 was still based on the allocation of patients into care bands by the Care Needs Assessment Centre. Tenand *et al*. were uniquely able to use the independently assigned care bands as the sole indicator of verified needs for long-term care.[190]

Tenand *et al*. assessed whether there was horizontal inequity in the general long-term care population, and then in home care versus residential care populations. This study identified negative horizontal inequity which implies that, even when correcting for differences in entitlements, the poor receive more long-term care (in value) than the rich.[190] The study also assessed which factors were associated with the inequity, and the results of this decomposition index are presented in Figure 14. Income is the factor most associated with inequity.

Tenand *et al*.'s subgroup analysis found that the pattern of care use changes with income for both home care and residential care. For elderly people who are eligible for residential care, the probability that an individual will use some residential care decreases from around 90% in the two bottom income deciles to about 80% for the richest 70% of individuals; among those eligible for home care, the probability of taking up care vouchers rather than in-kind care is highest at both the bottom and the top of the income distribution. These patterns of change persisted when the study controlled for differences in needs across the income distribution of each subgroup. A second decomposition analysis was carried out for the subgroups, and this is presented in Figure 15. The strongest association was again reported to be related to income.

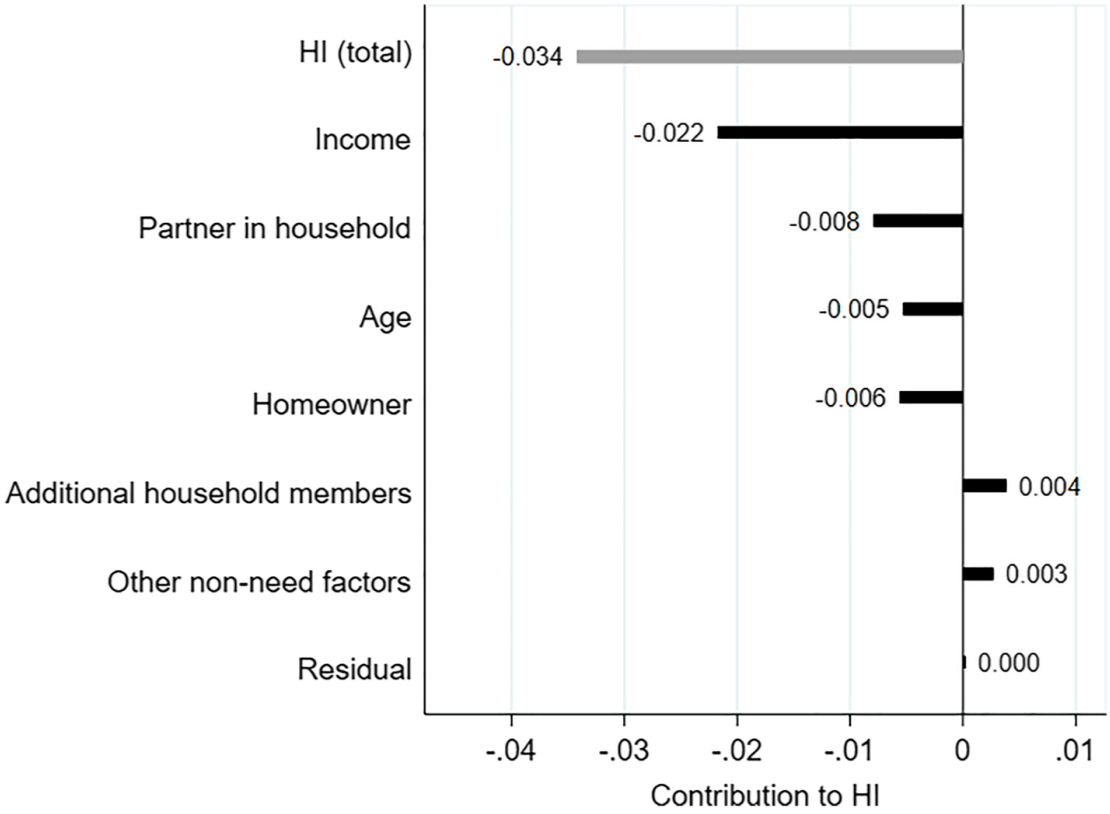

Figure 14 Decomposition of horizontal inequity index for long-term care in the Netherlands

Source: Tenand et al., 2020[190]

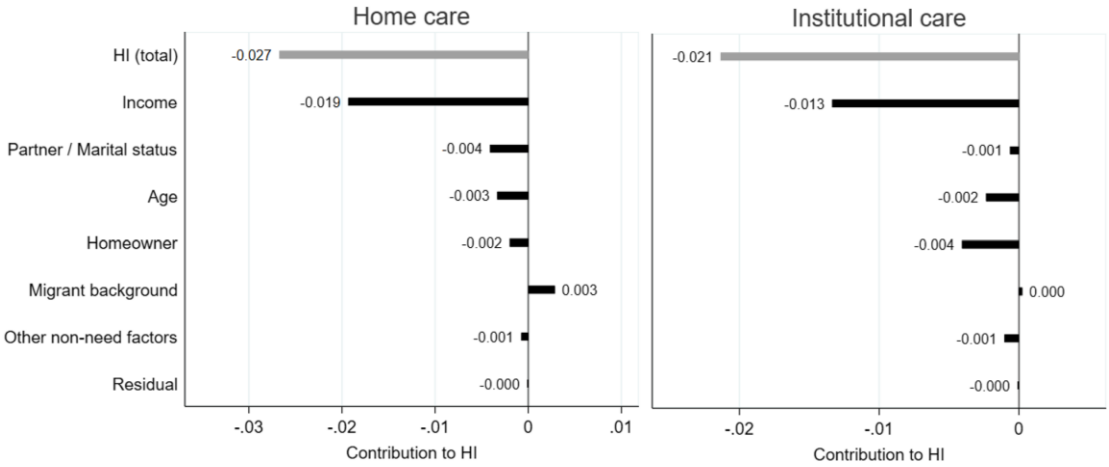

Figure 15 Decomposition of horizontal inequity index for long-term care in the Netherlands, by subgroup

Source: Tenand et al., 2020[190]

The second study from Tenand and colleagues[191] also looked at horizontal inequity, but with a focus on home care. The study analysed horizontal inequity in home care uses, in home care entitlements, and in the conversion of entitlements into home care use.

The estimates of the concentration indices and horizontal inequity indices in Table 36 show that there is a strong pro-poor concentration of home care use (−0.341 in the entire population). The first analysis shows that the pro-poor concentration of needs (−0.305) does not entirely offset the unequal distribution of home care use (−0.036). The horizontal inequity index for the second analysis is also negative (−0.015) but not statistically significantly different from 0, and therefore shows that there is no pro-rich inequity at the stage of home care eligibility. Pro-poor horizontal inequity in home care

use is thus not due to poorer elderly people receiving greater home care entitlements. The final analysis suggests that inequity in home care use stems mainly from the conversion of entitlements into actual use; poorer elderly people convert a larger share of their entitlements into actual use.

The authors also conducted regression analyses to determine what drives the identified inequity. This further analysis suggested that the Dutch need assessment seems effective at restricting socioeconomic inequity in home care use, but may not fully prevent inequity relating to other dimensions, e.g. those relating to ethnicity.

Table 36 Concentration indices and horizontal inequity indices for home care in the Netherlands

	Concentration index (outcome) [95% confidence interval]	Concentration index (need-predicted outcome) [95% confidence interval]	Horizontal inequity index (outcome) [95% confidence interval]	N
Home care use (equity overall)	−0.340*** [−0.361, −0.315]	−0.304*** [−0.318, −0.292]	−0.036*** [−0.057, −0.010]	154,709
Home care entitlements (equity at eligibility stage)	−0.288*** [−0.311, −0.267]	−0.272*** [−0.286, −0.261]	−0.016n.s. [−0.036, −0.005]	54,709
Conversion of entitlements into use (equity at use stage)	−0.095*** [−0.113, −0.071]	−0.040*** [−0.056, −0.022]	−0.054*** [−0.065, −0.040]	14,138

*** $p<0.01$, ** $p<0.05$, * $p<0.10$, n.s. $p\geq0.10$.

Note: The concentration index varies from −1 (maximum pro-poor inequality in the distribution of the outcome) to +1 (maximum pro-rich inequality). If it is equal to 0, outcome Y is equally distributed across income levels on balance. The horizontal index can vary between −2 and +2. When positive (negative), it indicates that the rich (poor) receive more long-term care services than the poor (rich), relative to their needs. When the concentration of entitlements exactly mirrors the concentration of use across the income distribution, then there is no income-related horizontal inequity and the value is 0.

Source: Tenand et al., 2020[191]

Another study from the Netherlands assessed equity in the long-term care sector with data from 2010 to 2013.[151] Duell *et al*. focused on practice variation in needs assessment across 32 care office regions. The study analysed both the probability of being granted an entitlement for long-term institutional care and the intensity of the care granted. Figure 16 shows practice variation in institutional care entitlements granted, and these data show that the predicted and the observed probabilities were significantly different from the population average in all regions except for regions 24, 5, 8, and 29. The variation around the average 29% probability of acceptance ranged from −1.28% to +1.70%. Figure 17 shows the practice variation in the intensity of institutional care granted. The predicted and observed probabilities were significantly different from the population average in all regions except regions 2, 15, 27, and 14. The variation around the average amount of institutional care entitlement granted was between −€3.82 and +€5.08. The study authors concluded that, overall, the Dutch long-term care system appears equitable; although analyses indicated the presence of some practice variation, its magnitude was very small by national and international standards.

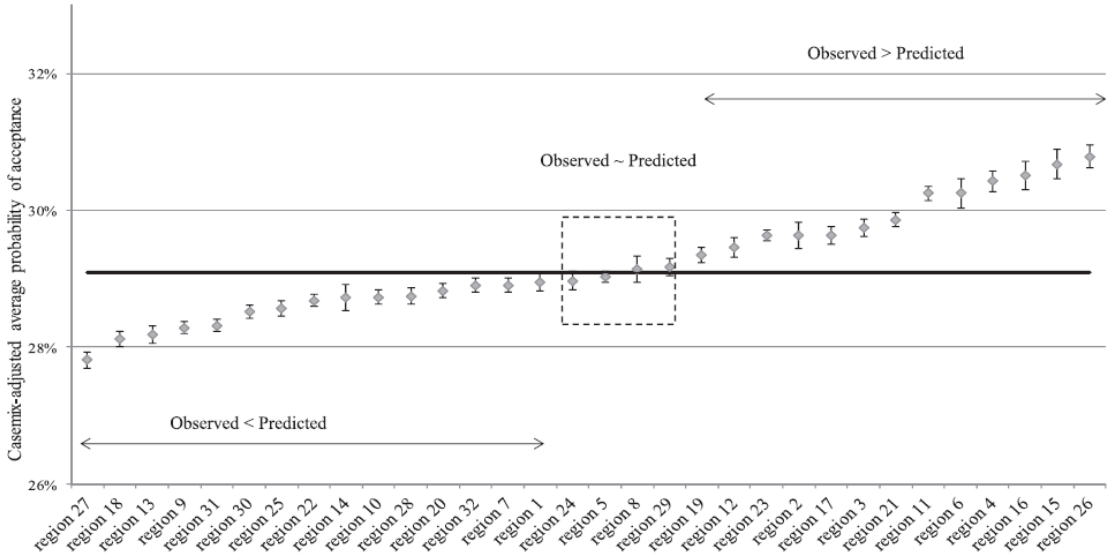

Figure 16 Practice variation in institutional care entitlements granted in the Netherlands

Source: Duell *et al.* 2017[151]

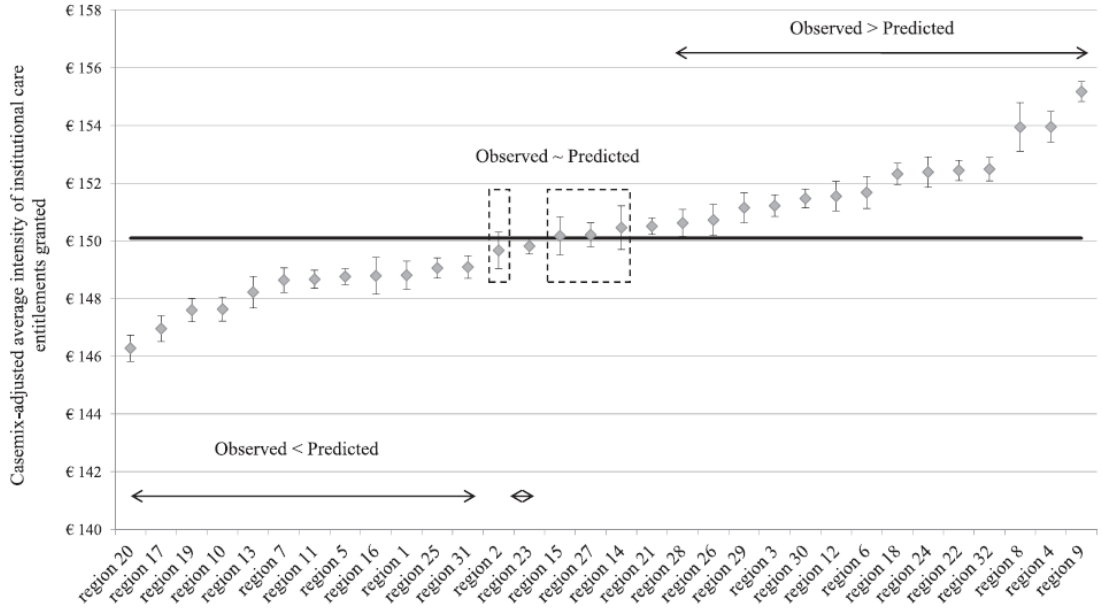

Figure 17 Practice variation in the amount of institutional care granted in the Netherlands

Source: Duell *et al.* 2017[151]

A report from the United States General Accounting Office (GAO) in 1990 used a mixed-methods study design to assess issues affecting nursing homes, including the types of elderly individuals having problems getting into nursing homes, the severity of access problems, factors contributing to the access problems and affecting the ability of the state to improve access, and state actions to improve access.[153]

Minnesota, New York, and Ohio minimised the problem of heavy-care patients getting into nursing homes by introducing case mix classification systems for Medicaid.

Interviews were conducted with healthcare officials in all three states. In Minnesota and Ohio, those with the heaviest care needs still had trouble accessing nursing home care because the upper limit of the case mix payment was too low to cover the cost of caring for these patients.[153] In New York, patients with the heaviest care needs also had issues with getting into nursing homes; however, in this case, officials suggested that it was due to a lack of equipment and staff to care for these types of residents.

The MedPAC reports assessed whether patients had no problem, a small problem, or a big problem accessing home health services when they sought them.[167-169] The reports compared data before and after the introduction of the PPS for Medicare home health (Table 37). There was a statistically significant increase in those reporting a big problem with access between 2000 and 2002; however, when the 2003 data are included, there is a statistically significant increase in those who reported no problem or a small problem with accessing home care between 2002 and 2003.

Table 37 Access to Medicare home healthcare in the USA

	No problem		A small problem		A big problem	
	%	Change	%	Change	%	Change
2000	76	-	13	-	11	-
2001	74	-	13	-	12	-
2002	76	-	13	-	12	The difference between 2000 and 2002 is significant at the *p* 0.05 level.
2003	77	-	12	-	11	The difference between 2002 and 2003 is significant at the *p* 0.05 level.
2004	graphically reported only	-	-	-	-	No statistically significant difference between 2003 and 2004.

Source: MedPAC reports 2000-2018[164-180,201]

The MedPAC reports also looked at access for rural versus urban Medicare beneficiaries; rural beneficiaries reported better access to care than their urban counterparts did in both 2002 and 2003, and the percentage of rural beneficiaries who did not have a problem with access remained at 80% in both years.[168] In 2004, 82% of rural beneficiaries had no problem with access, compared with 77% of urban beneficiaries.[169]

In 2003, MedPAC began collecting further access data. The share of Medicare beneficiaries living in an area (zip code) that was served by at least one home health agency was high across all years from 2003 to 2018 (range: 98.0–99.5%), as was the percentage living in an area that was served by more than one agency (range: 95.0–97.5%).[115,167-182]

4.6 Delivery at lowest level of complexity

Is there evidence to demonstrate that resource allocation through care bands delivers care at the lowest level of complexity, i.e. in the community, whenever possible?

We identified 15 studies that reported this outcome category; 11 from the USA, 2 from Canada, 1 from Australia, and 1 from New Zealand. Only one study actually measured the movement of people between residential care setting and the community; the rest of the studies reported the proxy outcomes of change in case mix and change in dependency.

4.6.1 USA Medicaid case mix nursing homes

Kenney and Holahan examined the impact of introducing case mix-adjusted reimbursement for Medicaid nursing homes in the 1980s through regression analyses.[161] They analysed how state Medicaid reimbursement policies affect how long hospitals keep patients. The paper reported that the results were contrary to expectations, in that states with a case mix adjustment for Medicaid payments to nursing homes have longer mean lengths of stay and higher proportions of long stays in hospital. The estimated impact of a case mix adjustment on the outlier proportion is also positive, but not significant. The authors suggest two explanations: the change in reimbursement was made for Medicaid patients only, not Medicare patients; or case mix adjustment policies were developed in

states where hospital discharge delays have historically been more of a problem.[161] The authors were unable to test either hypothesis. Analysis is reported in Appendix G.

A study by Feng *et al*. examined the effect of state Medicaid case mix payment on nursing home resident acuity.[152]

Several acuity indexes were used, including the Online Survey Certification and Reporting-based acuity index which combines a range of ADLs dependencies and special treatment measures for all residents in a nursing home, expressed as a weighted sum of specific resident characteristics. The authors also calculated the annual average nursing case mix index score for each facility based on MDS and RUG-III data.

There was an upward shift in case mix complexity in the year immediately following case mix reimbursement introduction relative to the year prior to case mix reimbursement introduction, regardless of which case mix index was examined (

Table 38).

Regression analysis showed that the adoption of state case mix reimbursement significantly increased nursing home case mix complexity over the study period across all of the acuity measures (Appendix G). The analysis showed a 2.5% increase in the average acuity of newly admitted patients and a 1.3–1.4% increase in the acuity of long-stay residents, following the introduction of case mix reimbursement. The regression analysis included calendar year dummy variables to show that the effects of case mix reimbursement were the net of the highly significant overall trends of increasing case mix complexity in nursing homes over time.

Table 38 Nursing home acuity score, by state case mix policy

	Acuity index	**(OSCAR)**								
	no change: no case mix			no change: case mix				Changed to case mix		
Timepoint	lower limit variance	average	upper limit variance	lower limit variance	average	upper limit variance	Timepoint	lower limit variance	average	upper limit variance
1996	7.17	11.03	14.83	6.66	10.71	14.86	1 year before	6.88	10.33	13.77
2002	7.57	11.21	14.91	7.41	10.98	14.58	Year of change	7.17	10.26	13.52
	-	-	-	-	-	-	1 year after	7.21	10.72	14.03
	-	-	-	-	-	-	2 years after	7.43	10.71	13.94
	Admission NCMI	**(MDS)**								
	no change: no case mix			no change: case mix				Changed to case mix		
Timepoint	lower limit variance	average	upper limit variance	lower limit variance	average	upper limit variance	Timepoint	lower limit variance	average	upper limit variance
1996	0.63	0.94	1.23	0.67	0.98	1.26	1 year before	0.58	0.87	1.13
2002	0.62	0.95	1.25	0.68	1.00	1.28	Year of change	0.63	0.93	1.20
	-	-	-	-	-	-	1 year after	0.69	0.96	1.21
	-	-	-	-	-	-	2 years after	0.71	0.97	1.21
	Annual NCMI	**(MDS)**								
	no change: no case mix			no change: case mix				Changed to case mix		
Timepoint	lower limit variance	average	upper limit variance	lower limit variance	average	upper limit variance	Timepoint	lower limit variance	average	upper limit variance
1996	0.57	0.71	0.84	0.59	0.72	0.85	1 year before	0.58	0.69	0.81
2002	0.57	0.72	0.87	0.58	0.73	0.90	Year of change	0.57	0.71	0.85
	-	-	-	-	-	-	1 year after	0.59	0.73	0.86
	-	-	-	-	-	-	2 years after	0.60	0.73	0.87

Abbreviations: OSCAR=Online Survey Certification and Reporting

Source: Feng *et al.,* 2006[152]

Grabowski investigated the impact of Medicaid case mix reimbursement on the dependency of nursing home residents.[156] The measure used was a case mix index expressed in minutes of staff time per day needed in the care of residents based on their abilities and the subsequent procedures they required (Table 39). Regression analyses showed that implementation of a case mix reimbursement system led to increased access for more dependent residents, but the effect was less in markets with excess demand for nursing home beds (Appendix G).

Table 39 Dependency index

Study ID	Country	Year	Group	Dependency index value
Grabowski 2002[156]	USA	1991–1998	States that did not change case mix payment policy: Without case mix payment system	104.66
			States that did not change case mix payment policy: With case mix payment system	104.54
			States that changed case mix payment policy: pre case mix payment system	103.24
			States that changed case mix payment policy: post case mix payment system	107.72
Gargett 2010[155]	Australia	1968–1969	All residents	100
		1969–1970	All residents	106.67
		1970–1971	All residents	107.04
		1971–1972	All residents	108.23
		1972–1973	All residents	108.32
		1973–1974	All residents	108.56
		1974–1975	All residents	109.02
		1975–1976	All residents	109.59
		1976–1977	All residents	109.85
		1977–1978	All residents	110.56
		1978–1979	All residents	111.52
		1979–1980	All residents	112.2
		1980–1981	All residents	113.06
		1981–1982	All residents	113.34
		1982–1983	All residents	112.95
		1983–1984	All residents	113.3
		1984–1985	All residents	114.29
		1985–1986	All residents	115.27
		1986–1987	All residents	116.26
		1987-1988	All residents	117.23
		1988–1989	All residents	100
		1989–1990	All residents	101.46
		1990–1991	All residents	103.07

Study ID	Country	Year	Group	Dependency index value
		1991–1992	All residents	103.97
		1992–1993	All residents	106.44
		1993–1994	All residents	108.45
		1994–1995	All residents	110.66
		1995–1996	All residents	113.88
		1996–1997	All residents	115.89
		1997–1998	All residents	100
		1998–1999	All residents	102.82
		1999–2000	All residents	103.48
		2000–2001	All residents	104.37
		2001–2002	All residents	104.95
		2002–2003	All residents	105.22
		2003–2004	All residents	105.49
		2004–2005	All residents	105.1
		2005–2006	All residents	105.06
		2006–2007	All residents	105.03
		1992–1993	New residents	100
		1993–1994	New residents	101.55
		1994–1995	New residents	103.61
		1995–1996	New residents	106.66
		1996–1997	New residents	110.03
		1997–1998	New residents	100
		1998–1999	New residents	102.32
		1999–2000	New residents	102.67
		2000–2001	New residents	103.79
		2001–2002	New residents	104.49
		2002–2003	New residents	104.45
		2003–2004	New residents	104.68
		2004–2005	New residents	104.83
		2005–2006	New residents	105.53
		2006–2007	New residents	105.45

Two studies assessed the impact of introducing case mix reimbursement for Medicaid nursing homes in New York state.[188,193] The RUG-II classification system was implemented by the New York Department of Health on 1 January 1986.[188] Schultz *et al*. reported a major shift in resident-care intensity that occurred in New York long-term care facilities after the implementation of RUG-II (Table 40). Total assessments increased less than 1% from 1985 to 1991, so the changes demonstrated by these data demonstrate real shifts in case mix categories. The highest-intensity case mix groups, Rehabilitation categories A and B and Clinically Complex category D, had the greatest increase in numbers of residents. In the low-intensity care categories, including Physical A/B and Behavioral A/B, there were substantial reductions in numbers of residents assessed as belonging to these categories.

Also in New York, state, Thorpe *et al*. assessed the changes that occurred in the first year of implementation of RUG-II-based reimbursement.[193] In skilled nursing facilities (SNFs), the number of patients in light-care categories decreased whereas the number of heavier-care patients increased.

As intended, the number of the lightest-care patients (those in reduced Physical A) residing in nursing homes decreased nearly 50%. At the same time, there was a substantial increase in the number of more expensive rehabilitation, clinically complex, and special care patients residing in nursing homes.

The study also looked at health-related facilities, which the paper suggests, provide a lower level of care than SNFs and the hope would be that lower care case mix patients would move there. The number of relatively light-care patients increased in health-related facilities; for example, the number of Reduced Physical Functioning B and C patients increased by 27.5% and 39.5%, respectively. Other light-care patients, such as Clinically Complex A, increased by a similar amount.[193]

Table 40 RUG-II change in case mix

Study ID		**Schultz 1994[188]**	**Schultz 1994[188]**	**Thorpe 1991[193]**	**Thorpe 1991[193]**
Country		USA	USA	USA	USA
Province/state		**New York**	**New York**	**New York**	**New York**
Year		1985	1991	1985–1986 change	1985–1986 change
Group		**-**	**-**	**SNF**	**Health-related facility**
State-wide CMI		0.935811	1.092439	-	-
N total		91,419	92,214	-	-
Special A	*n*	958	1,038	-	-
	%			9.2	<50 patients
Special B	*n*	2,588	3,763	-	-
	%			34.4	<50 patients
Rehabilitation A	*n*	465	891	-	-
	%			72.8	103.7
Rehabilitation B	*n*	982	5,436	-	-
	%			231.3	<50 patients
Clinically Complex A	*n*	2,141	2,809	-	-
	%			2.4	27.9
Clinically Complex B	*n*	4,082	8,544	-	-
	%	-	-	48.5	84.4
Clinically Complex C	*n*	2,311	6,810	-	-
	%	-	-	82.6	<50 patients

Study ID		Schultz 1994[188]	Schultz 1994[188]	Thorpe 1991[193]	Thorpe 1991[193]
Country		USA	USA	USA	USA
Province/state		**New York**	**New York**	**New York**	**New York**
Year		1985	1991	1985–1986 change	1985–1986 change
Group		**-**	**-**	**SNF**	**Health-related facility**
Clinically Complex D	*n*	432	2,017	-	-
	%	-	-	78.4	<50 patients
Behavioral A	*n*	2,517	945	-	-
	%	-	-	−30.2	−17.2
Behavioral B	*n*	5,371	3,000	-	-
	%	-	-	−5.5	10.4
Behavioral C	*n*	1,057	1,041	-	-
	%	-	-	34.5	<50 patients
Physical A	*n*	27,634	15,120	-	-
	%	-	-	−49.7	−6.2
Physical B	*n*	4,592	3,492	-	-
	%	-	-	−25.3	27.5
Physical C	*n*	25,995	25,268	-	-
	%	-	-	−6.1	39.5
Physical D	*n*	7,711	8,798	-	-
	%	-	-	1.9	−15.8
Physical E	*n*	2,583	3,242	-	-
	%	-	-	−14.7	<50 patients

Nyman and Connor looked at Medicaid case mix reimbursement in Minnesota nursing homes.[184] A new case mix reimbursement system was implemented in 1985 and this paper compares the case mix classification in the first full year of implementation, 1986, with data from 1990. Table 41 shows the percentage change in total patient days by case mix type between 1986 and 1990. The biggest decreases are seen in the lower care case mix groups C and F, and the biggest increases are in higher-care case mix groups G and J; however, there is also a decrease in patients in case mix group K, the group with the highest level of care needs. Nyman and Connor suggest that it is unlikely that these large changes would solely represent a secular trend in the types of patients presenting themselves for admission, and that such changes reflect at least in part the nursing homes' ability to select more

profitable patients for admission (higher-care case mix) or to reclassify existing patients into more financially advantageous categories.[184]

Table 41 Change in total patient days by case mix type

Case mix type	% change between 1986 and 1990
A (0–3 ADLs)	−7.55
B (0–3 ADLs with behaviour problems)	−13.69
C (0–3 ADLs and special nursing)	−60.52
D (4–6 ADLs)	−0.58
E (4–6 ADLs and behaviour problems)	−14.5
F (4–6 ADLs and special nursing)	−57.83
G (7–8 ADLs and heavy feeding)	37.96
H (7–8 ADLs, heavy feeding, and behaviour problems)	11.79
I (7–8 ADLs and very heavy feeding)	−19.3
J (7–8 ADLs, very heavy feeding, and severe neurological diagnosis)	38.86
K (7–8 ADLs and special nursing)	−38.78

Source: Nyman and Connor, 1994[184]

Arling and Daneman evaluated the impact of nursing home case mix reimbursement on facility case mix and costs in Mississippi and South Dakota.[141] Both states introduced case mix reimbursement in 1993. The changes in RUG-III case mix scores are reported in Table 42. Facility case mix scores increased significantly between 1992 and 1994 in both states; Mississippi, 0.999 mean case mix score in 1992 versus 1.031 in 1994 ($p < 0.001$), and South Dakota, 0.970 mean case mix score in 1992 versus 1.009 in 1994 ($p < 0.001$). Introduction of case mix reimbursement systems appeared to achieve the policy aim of improved access for heavy-care residents.[141]

Table 42 RUG-III changes in case mix

Study ID	Country	Province/state	Year	Special rehabilitation		Extensive services		Special care		Clinically complex		Impaired cognition		Behavioural problems		Physically reduced function		Lowest RUG-III group	
				n	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Arling 2002[141]	USA	Mississippi	1992	-	1.4	-	0.9	-	8.5	-	14.6	-	-	-	1.1	-	45.7	-	17.3
		Mississippi	1994	-	2.5	-	1.5	-	9.1	-	14.1	-	-	-	1	-	40	-	15.1
		Mississippi	1992 vs. 1994	-	*p*<0.001	-	*p*<0.01	-	ns	-	ns	-	-	-	ns	-	*p*<0.001	-	*p*<0.001
		South Dakota	1992	-	1	-	0.6	-	3.7	-	14.3	-	-	-	1.2	-	50	-	19.6
		South Dakota	1994	-	2	-	0.5	-	4.7	-	11.9	-	-	-	1.2	-	44.4	-	15.3
		South Dakota	1992 vs. 1994	-	*p*<0.001	-	ns	-	*p*<0.001	-	*p*<0.001	-	-	-	ns	-	*p*<0.001	-	*p*<0.001
Sutherland 2013[46]	Canada	Alberta	2009/10	1,895	5%	13,987	38%	4,377	12%	2,003	5%	10,182	28 %	-	-	-	-	-	-
			2012/13	1,855	5%	15,795	43%	3,940	11%	1,697	5%	9,703	27 %	-	-	-	-	-	-

Abbreviations: ns=not significant

4.6.2 PPS skilled nursing facilities

The United States General Accounting Office (GAO) evaluated the impact of the Medicare PPS in SNFs.[154] The change in case mix classification is reported in Table 43. The data show that the overall proportion of SNF patients initially classified into rehabilitation resource use categories remained the same. However, the distribution of patients within rehabilitation categories changed considerably from the start of 1999 to the first quarter 2001. By 2001, more Medicare patients receiving therapy were initially classified into the two moderate rehabilitation categories – medium (16% increase) and high (17% increase) – with the two groups accounting for about two-thirds of Medicare SNF admissions. The percentage of patients initially classified into ultra-high – the most intensive rehabilitation category – decreased by 51.5% to comprise just 3% of all Medicare SNF patients at their initial assessment in 2001.[154] There was a corresponding decrease in the lowest level of complexity, custodial care, with a 42.2% decrease. According to the GAO, this move is consistent with the SNF providers' assertions that the high and medium care categories have more favourable payments, relative to their costs, than other categories. The study authors were not able to tell if this shift reflects a change in the care needs of patients from 1999 to 2001.

Table 43 Share of Medicare patients at initial assessment by case mix category

Predominant type of care	Category	January to March 1999 (%)	January to March 2000 (%)	January to March 2001 (%)	Percentage change 1999–2001
Rehabilitation therapy	Ultra-high	6.6	3.8	3.2	−51.5
	Very high	15.6	14.1	11.8	−24.4
	High	37.1	42.1	43.5	17.3
	Medium	15.9	16.9	18.5	16.4
	Low	0.5	0.3	0.2	−60.0
Extensive, special care, and clinically complex	Extensive services	11.9	13.1	13.3	11.8
	Special care	5.8	5.1	4.9	−15.5
	Clinically complex	4.1	3.1	2.9	−29.3
Custodial care	Other	2.6	1.6	1.5	−42.2

Source: United States General Accounting Office (GAO), 2002[154]

MedPAC is an independent congressional agency established by the Balanced Budget Act of 1997 to advise the United States Congress on issues relating to the Medicare programme.[115] MedPAC develops two standing annual reports for Congress each year. The data presented here are a synthesis of those reports.

MedPAC has measured the average risk-adjusted rates of discharge to the community over time (Figure 18). The average risk-adjusted rates of discharge to the community steadily improved between 2000 and 2018. The graph also shows avoidable readmissions. MedPAC separately measured potentially avoidable readmissions that occur during the SNF stay and those that occur within 30 days of discharge from the SNF because they measure different aspects of care: care furnished by the SNF and the SNF handoff to the next setting (including home). Between 2012 and 2018, the average risk-adjusted rate of potentially avoidable readmissions during the SNF stay improved, declining from 11.4% in 2012 to 10.6% in 2018. The rates of potentially avoidable readmissions during the 30 days after discharge from the SNF have varied more; between 2012 and 2017, this post-discharge rate worsened (it increased from 5.7% to 6.1%), but it improved between 2017 and 2018 (i.e. decreasing to 5.9%).

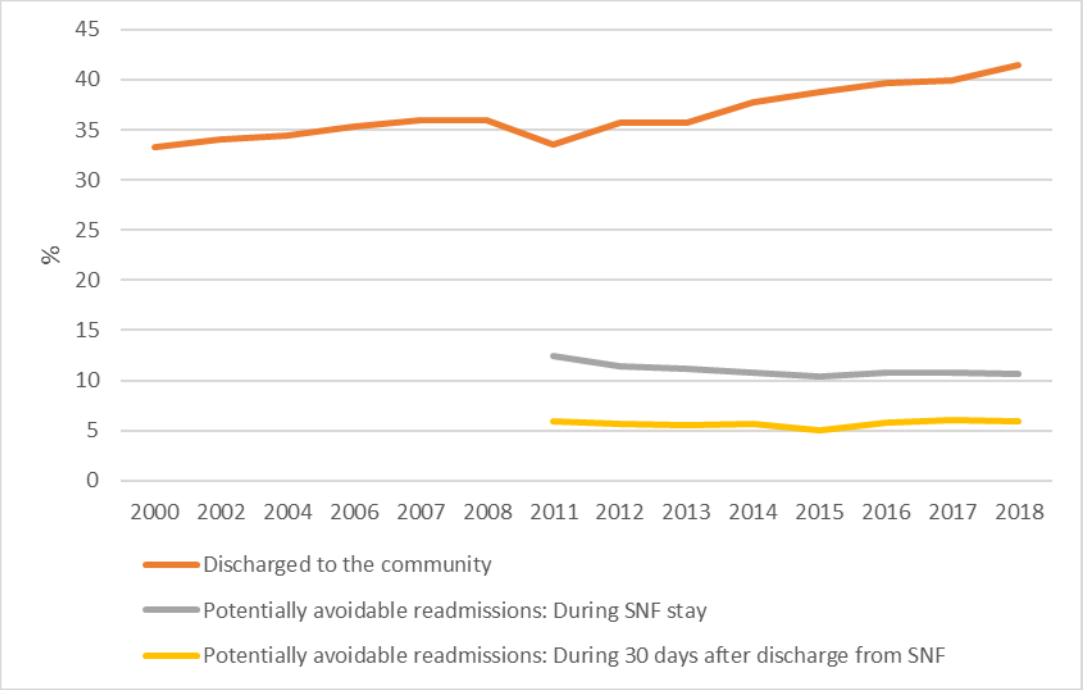

Figure 18 Community discharge from SNFs

Note: Data on potentially avoidable readmission only collected from 2011 onwards and discharged to the community data collected annually from 2011 onwards.

Source: MedPAC reports 2011, 2019, 2020.[115,174,182]

MedPAC also looked at the breakdown of days per RUG over time. Figure 19 shows that case mix continued to shift towards rehabilitation plus extensive e-service RUGs and away from other broad RUG categories. Additionally, within the rehabilitation RUGs, the dispersal of days continued to shift towards the highest-intensity, and therefore highest-payment, therapy groups. MedPAC suggests that the large number of rehabilitation plus extensive services days may reflect providers' better record-keeping and coding improvements to record extensive services provided to high-care patients in order to obtain higher payments associated with these case mix groups. Additionally, MedPAC states that the growth also reflects specific strategies by some providers to maximise profits; serving Medicare patients and furnishing intensive therapy are part of the business strategy.

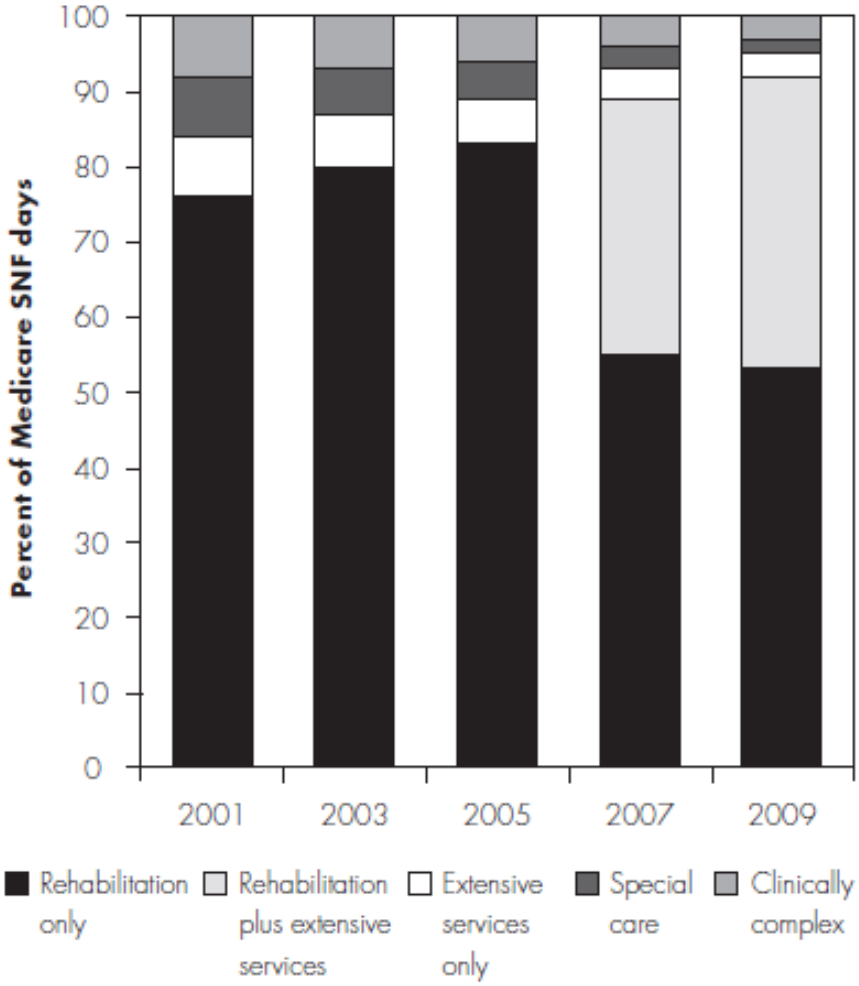

Figure 19: Change in case mix for SNFs

Source: MedPAC, 2011[174]

MedPAC also reported on the episodes of home health (Figure 20) and share of Medicare beneficiaries using home health services (Figure 21).

Figure 20 shows the change in home health episodes between 2002 and 2016. Between 2002 and 2011, total episodes increased by 67%.[181] There has been a small decline since 2011, which is mostly concentrated in five states: Florida, Illinois, Louisiana, Tennessee, and Texas.

MedPAC offers some explanation of the decline since 2011.[181] Medicare has taken action to curb fraud, waste, and abuse in Medicare home healthcare. There have been moratoriums on new agencies in several areas that have seen rapid growth in supply and utilisation, including Illinois, Florida, and Texas. The number of hospital discharges, a common source of referrals, has declined since 2009, reducing some of the demand for home healthcare. The decrease in utilisation in areas that have been targeted by Medicare's programme integrity efforts suggests that it is possible to use these methods in order to address excessive or unwarranted services, and that expansions of the programme would be beneficial.

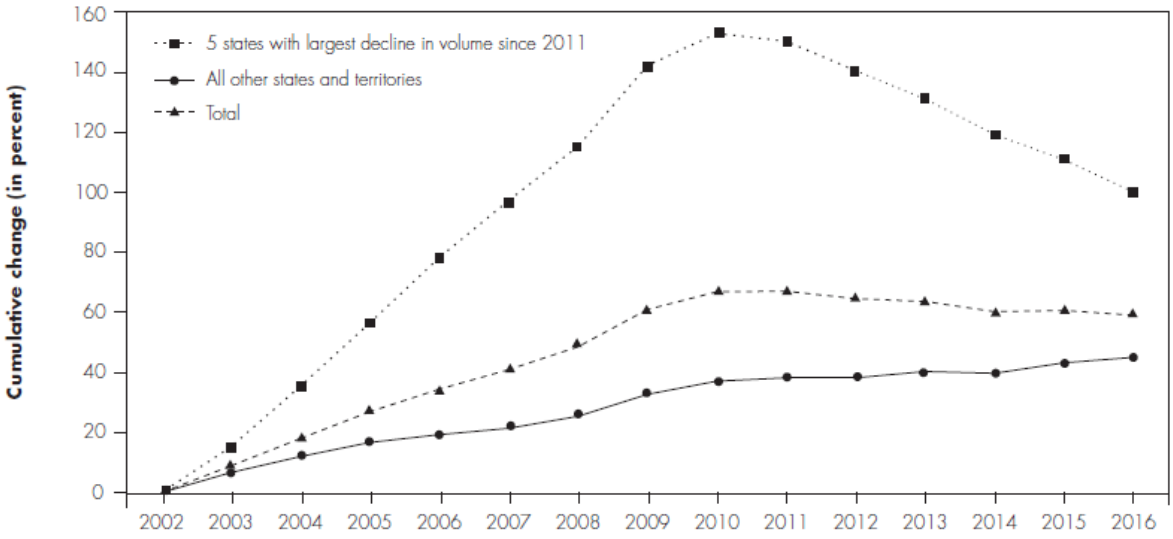

Figure 20 Change in home health episodes

Source: MedPAC, 2018[181]

Figure 21 shows the proportion of Medicare beneficiaries using home health services between 1997 and 2016. Steps were taken in 1997 to reduce the growth in usage of home healthcare.[174]

There was a sharp decline in service usage after 1997 following the measures introduced by Medicare, including the PPS. There was a period of growth between 2002 and 2010, while from 2011 onwards, there has been a period of decline. This is the same trend as seen in home health episodes data.

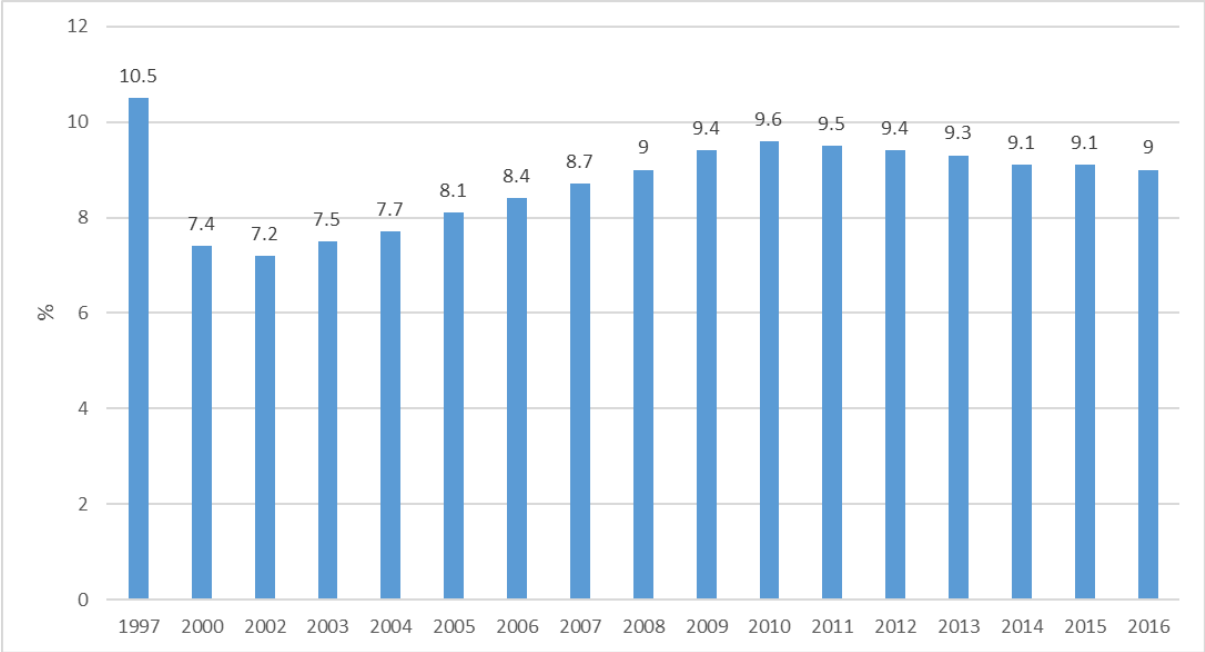

Figure 21 Share of Medicare beneficiaries using home health services

Source: MedPAC reports 2000-2020[115,164-180,182,201]

Schlenker *et al.* assessed the impact of the Medicare PPS on case mix in home health.[114] Table 44 shows the changes in Home Health Resource Groups (HHRGs) in the first year after the introduction of the reimbursement scheme. There is a shift away from clinically straightforward groups (e.g. clinical C0, functional F0) towards more clinically complex and functionally dependent patients. Schlenker *et al.* offer several explanations for the results: providers might have responded to the PPS by selecting patients in the higher payment HHRGs, or shifts could have resulted from more accurate

reporting by agencies or from deliberate manipulation of the data to classify patients in more profitable RUGs (case mix creep).[114]

Table 44 HHRG change in case mix in the USA

HHRG	1999–2000	2001
Clinical C0 (minimum)	33.0%	23.8%
C1 (low)	36.1%	36.5%
C2 (moderate)	26.6%	33.6%
C3 (high)	4.2%	6.1%
Functional F0 (minimum)	9.0%	6.0%
F1 (low)	28.5%	25.3%
F2 (mod)	46.1%	51.6%
F3 (high)	10.3%	11.2%
F4 (maximum)	6.1%	5.9%
Service S0 (minimum)	69.6%	61.3%
S1 (low)	8.2%	8.8%
S2 (moderate)	16.5%	21.2%
S3 (high)	5.7%	8.6%

Source: Schlenker *et al.*, 2005[114]

Since the implementation of the PPS, there has been a steady increase in the average case mix of home health patients, with the overall observed case mix increasing by 15.03% between 2000 and 2007.[198] The report from White *et al.* attempts to investigate the rationale for the increase in the average case mix of home health patients.[198] The paper looked at both real (predicted) and nominal (unpredicted) change. Real change is estimated from the relationship between patient characteristics and case mix, and changes in the characteristics of patients over time, whereas nominal change is the portion of case mix change that cannot be explained by changes in patient characteristics. Nominal case mix change is assumed to reflect differences in provider coding practices over time.[198]

The analysis of case mix change from White *et al*. is reported in Table 45.

The study estimated that 88.9% of the case mix change that occurred between the baseline period and 2006 was unpredicted, as was 90.2% of the case mix change that occurred between the baseline period and 2007. The authors suggest that this reflects changes in agency coding practices or other nominal factors, in particular case mix creep.[198]

White *et al*. report very little change in real (or predicted) case mix. However, given the increase in actual case mix that occurred from 2000 to 2007, the gap between actual and expected case mix continues to increase, with a higher proportion of the increase attributable to nominal factors.[198]

Table 45 Estimates of 2006 and 2007 case mix change for home health

Measure	Value
Actual relative payment weight	
Baseline period (2000)	1.095917
2006	1.250078
2007	1.260612
Change in case mix (relative to baseline period)	
Baseline to 2006	0.1542
Baseline to 2007	0.1647
Real (predicted) change in case mix	
2006	0.0177
2007	0.0161
Real (predicted) relative payment weight	
2006	1.1136
2007	1.112
Nominal (unpredicted) change in case mix	
2006	0.1365
2007	0.1486
Nominal (unpredicted) change as a percentage of actual increase in case mix	
2006	88.55%
2007	90.23%
Real (predicted) change as a percentage of actual increase in case mix	
2006	11.45%
2007	9.77%

Source: White *et al*., 2009[198]

4.6.3 Other countries

In British Columbia, Canada it was determined in 1989 that a new planning and resource allocation model for continuing care services should be developed.[202] This included a shared classification system across home care and residential care clients.[160] At the same time, it was decided that for the 5 years from the 1990–91 to 1994–95 fiscal years, some future resources would be shifted from the residential sector to the community sector in order to expand the natural growth rate of community- and home-based services.

Direct comparisons for utilisation data in different settings were possible, as the same care-level classification system is used in British Columbia for home care and residential care clients, and these

data are presented in Figure 22. Home care services were seen to increase over this time period, with a corresponding decrease in utilisation of residential care services; however, there was a trend in this general direction prior to the change in reimbursement method.

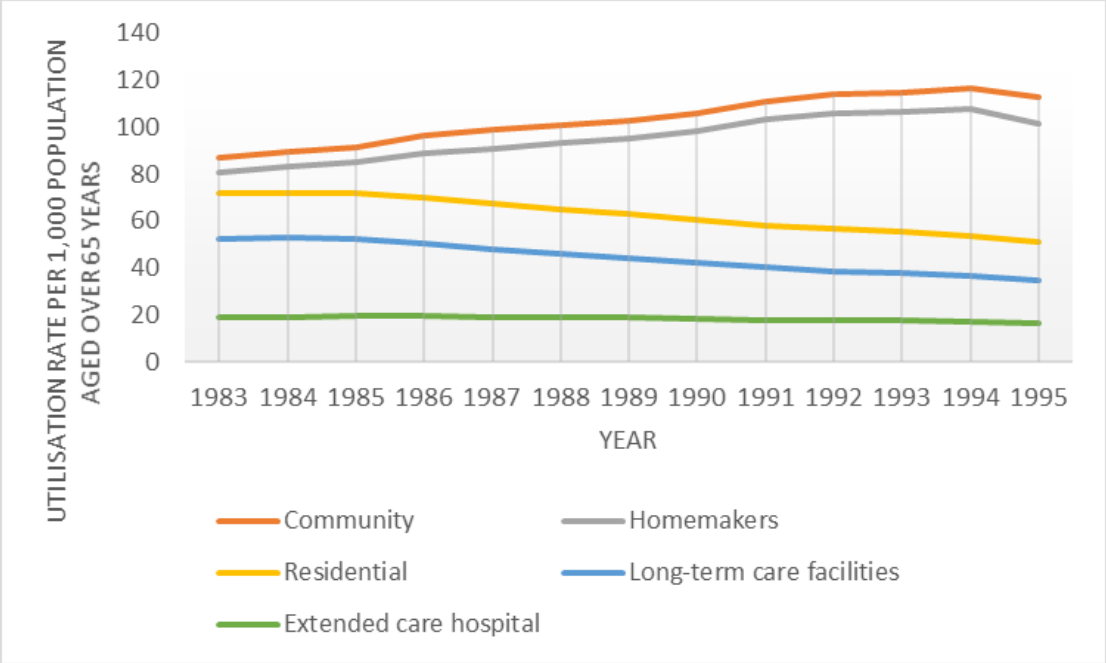

Figure 22 Movement between home care and residential care in British Columbia, Canada

Source: Hollander and Chappell, 2007[160]

A study by Sutherland *et al*. in Alberta, Canada assessed the impact of introducing RUG-III case mix classification in the long-term care sector.[46] Long-term care facilities in Alberta include nursing homes and auxiliary hospitals. Table 42 shows the change in RUG-III groups between 2009–10 and 2012–13. The changes in groups across these 2 time points were statistically significant (p<0.001). There was no change in the most clinically complex group, special rehabilitation; however, in the next most complex group, extensive services, there was a steep increase in the percentage of resident days, from 38% in 2009–10 to 43% in 2012–13.[46]

As outlined in Section 3.4, funding for aged residential care in New Zealand utilises a needs assessment which places individuals who enter aged residential care into one of four levels of care, or bands, with each band worth a fixed weekly subsidy amount.[86,87] This system was introduced in 2001.

Boyd *et al*. investigated trends in dependency in aged-residential care in Auckland, New Zealand over a 20-year period including the implementation of the new classification system.[146] Dependency scale data are reported in Table 46.

There was a decrease in the proportion of residents who were apparently independent, from 16% in 1988 to 4% in 2008, and a corresponding increase in the proportion of residents classified in the highest dependency category, from 12% in 1988 to 21% in 2008. The study authors indicated that it is probable that government policies supporting increased community care and changes in public opinion of aged care as a lifestyle choice have affected the dependency of the population in residential care facilities in New Zealand.[146] They also suggest that, given the increasing availability of care in the community, only the most dependent individuals are likely to be admitted to aged-residential care.

Table 46 Composite dependency scale, Auckland, New Zealand

Year	Apparently independent	Some dependency	Moderate dependency	Appreciable dependency	Hospital-level care	Significance test over time

of analysis	*%*	*%*	*%*	*%*	*%*	*value*
1988	16%	25%	23%	24%	12%	$p<0.0001$
1993	9%	19%	26%	28%	18%	
1998	5%	17%	28%	30%	19%	
2008	4%	16%	25%	33%	21%	

Source: Boyd et al., 2011[146]

Gargett investigated the dependency of nursing home residents between 1968 and 2007 in Australia across three classification systems, with the first case mix classification system having been introduced in 1988.[155] The three systems considered were as follows:

- First classification period – January 1969 to June 1988: A system with two categories – those requiring intensive nursing care and those who did not – was used.
- Second classification period – July 1988 to September 1997: A five-level system operated, with the most dependent residents classified as Category 1 and the least dependent as Category 5.
- Third classification period – October 1997 (following the amalgamation of the hostel and nursing home sectors): Residents of high-level residential aged care services were classified into four dependency categories.

The newest reform, described in Section 3.1.1.2, was not evaluated in this study.

The aggregate dependency index for all residents across the three classification periods is shown in Table 39 and Figure 23. Within each classification period there has been a stable increase in the overall dependency of residents. During the first classification period, the average annual increase in aggregate dependency was 0.91%, and during the second and third periods, this was 1.99% and 0.56%, respectively. Over the entire period, aggregate dependency increased by just over 1% per year on average. Gargett surmises that the aggregate dependency of the population has, for the most part, increased since the late 1960s, although there has been a slowing in the rate of increase in aggregate dependency during the third classification period. The increase in the dependency of residents corresponds with the government policy objectives at the time; however, Gargett stipulates that causality has not been evaluated.[155]

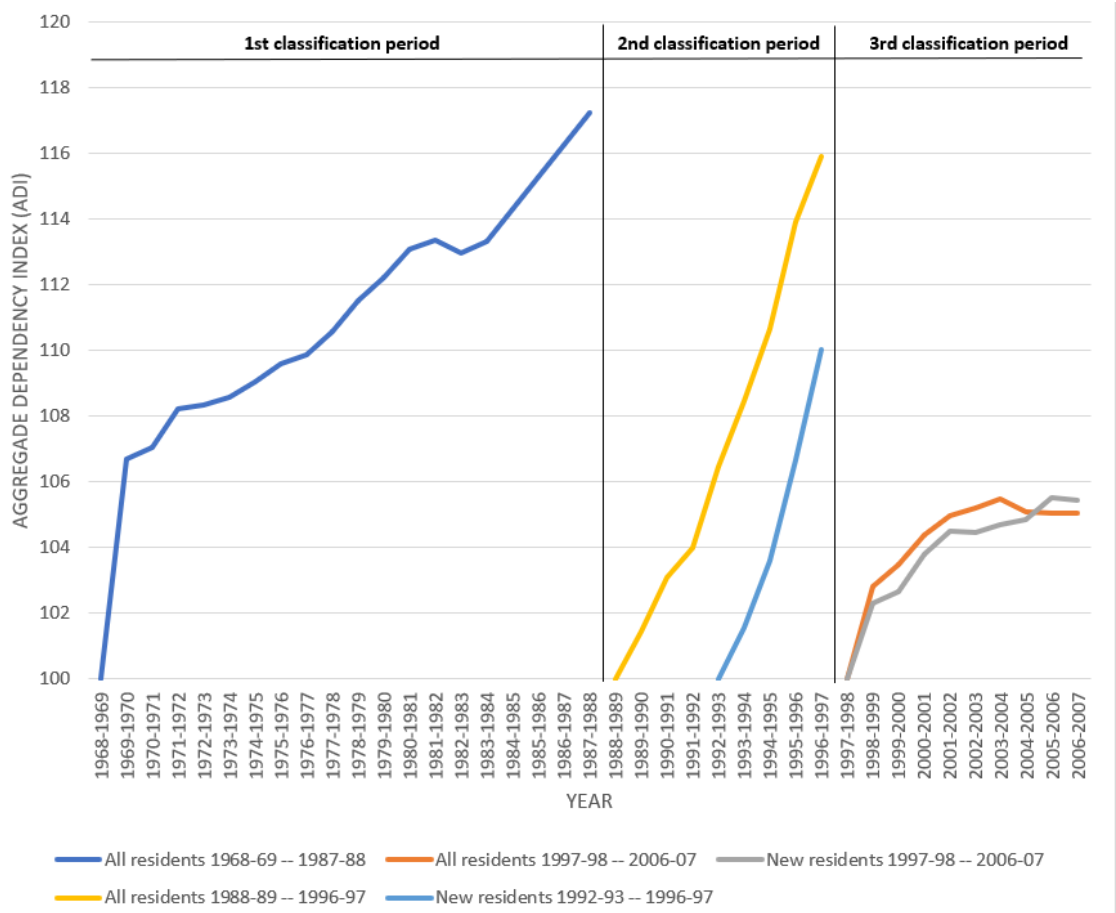

Figure 23 Aggregate dependency index for all residents (1968–69 to 2006–07) and new residents (1992–93 to 2006–07) in Australia

Source Gargett, 2010[155]

4.7 Costs

Is there evidence to demonstrate that resource allocation through care bands provides value for money for the Exchequer?

Fifteen studies reported in 26 reports explored the costs associated with case mix classification systems. Twelve of these studies were based in the USA, two were based in Canadian provinces (Ontario and British Columbia), and one was based in New Zealand. These studies reported on total costs, margins, efficiency, and how payment rates and costs are often mismatched.

The majority of our data are based in the USA, and these studies predominantly discuss Medicaid reimbursement systems. Comparative data are available under Medicaid for total costs and margins following the implementation of case mix classification, enabling some basic conclusions to be reached. Government reports of Medicare spending and margins over the years were available and are presented below in their own section.

4.7.1 Costs

Four studies examined costs before and after case mix implementation under Medicaid in the USA. Three of these reported nursing home costs[126,141,149] and one reported long-term care facility costs.[188] Nursing home costs were found to have increased following case mix implementation across all three studies that examined nursing home costs. Please see Tables 52–54 for specific changes in costs from

each study. On the other hand, long-term care facility costs increased for the first few years following case mix implementation, then began to decline (Table 50).

Table 47 Swan 2003 nursing home costs before and after case mix reimbursement

	Costs (in US$ thousands)	
State	Before (year)	After (year)
Texas	1,552 (1988)	2,010 (1991)
Minnesota	1,792 (1984)	2,120 (1988)
South Carolina	1,611 (1986)	1,811 (1988)

Note: Figures for Texas and Minnesota are net costs, figures for South Carolina are total costs.

Source: Swan and Pickard, 2003[126]

Table 48 Arling 2002 nursing home costs before and after case mix reimbursement

	Mean reported per diem cost (in US$)	
Type of cost	Before (1992)	After (1994)
Mississippi		
Direct care cost	22.94	27.65
Other operating cost	28.18	32.57
Capital cost	5.92	5.99
South Dakota		
Direct care cost	27.30	31.88
Other operating cost	33.57	37.02
Capital cost	4.35	4.71

Source: Arling and Daneman, 2002[141]

Table 49 Davis 1998 nursing home costs before and after case mix reimbursement

	Nursing home cost per diem (in US$)	
State	Before (1989)	After (1991)
Kentucky	45.28	54.35

Source: Davis *et al*., 1998[149]

Table 50 Schultz 1994 long-term care facility staffing costs before and after case mix reimbursement

	Per diem fees and contracts (annual cost per facility, in US$)	
State	Before (1983)	After (1987)
New York	56,543	95,302

Source: Schultz *et al*., 1994[188]

Schlenker examined costs in states in the USA with case mix-based Medicaid reimbursement systems (Maryland, Ohio, and West Virginia) versus states with different payment systems, including 'facility-specific' systems in Colorado and Florida and 'class-rate' systems in Texas and Utah. The author found that average patient care costs per day are higher in case mix and facility-specific states than in class-

rate states (Table 51). Schlenker also performed a regression analysis (Appendix F) which suggested that there was a strong association between case mix and patient care cost in case mix systems (and in facility-specific systems) compared with class-rate systems.[187] The author concluded that while case mix systems more closely link payment and nursing home costs to resident need, they are also associated with higher costs.[187]

Table 51 Schlenker 1991 costs under case mix versus other reimbursement systems

State by reimbursement system	Patient care costs (per patient day) (in US$)
Case mix system	
Maryland	20.41
Ohio	21.59
West Virginia	20.70
Facility-specific	
Colorado	17.89
Florida	22.00
Class-rate	
Texas	15.64
Utah	15.66

Source: Schlenker, 1991[187]

Cohen and Dubay, examined how Medicaid reimbursement methods affected nursing home costs in 1981 cost reports.[147] Regression analysis (see Appendix F) found no significant effect of case-mix reimbursement systems on costs, while costs increased with the percentage of Medicaid patients under retrospective and prospective reimbursement systems. However, the authors acknowledged that only a small number of states had adopted case-mix reimbursement in 1981, making it difficult to adequately test for any effects.

According to Swan and Pickard, "although cost constraint is a general state and federal goal [in the USA], case mix systems are not designed to control expenditures, rather to better match them to actual costs of needed care. Thus, if case mix payment leads to higher rates and expenditures, this may be consistent with decision-maker intent."[126(p33)]

In Canada, two papers reported costs associated with case mix classification systems;[143,160] however, neither provided data prior to the implementation of case mix, preventing any clear conclusions on its impact. Botz *et al*. compared total nursing per diem and total per diem costs from 1991 to 1992 in Ontario, Canada with the Alberta, RUG-III, and Medicus classification systems. Results showed that both nursing and total per diem costs are higher for RUG-III and Medicus systems than those associated with the Alberta classification system (Table 52).[143] Hollander and Chappell compared home care and residential costs for patients under the British Columbia continuing care system from 1987–88 to 1993–94. They found that costs for patients are lower for home care than residential care, even at the same care level (Table 53).[160]

Table 52 Costs associated with the Alberta, RUG-III, and Medicus classification systems, 1991–1992

	Average costs (CA$)		
Type of cost	**RUG-III**	**Alberta**	**Medicus**
Nursing per diem	64	26	73
Total per diem	177	73	201

Source: Botz *et al*., 1993[143]

Table 53 Average annual patient costs in home and residential care, by care category

	Average costs for 1 year (in 1991–1992 CA$)					
	1987–88		1990–91		1993–94	
Level of care	Home care	Residential	Home care	Residential	Home care	Residential
Personal Care (PC)	5,505.89	13,186.73	5,413.16	12,504.54	5,190.72	12,137.07
Intermediate Care 1 (IC1)	10,303.09	20,375.47	10,241.82	20,185.97	8,762.18	20,150.58
Intermediate Care 2 (IC2)	16,481.89	24,109.59	16,081.34	23,597.33	14,176.47	23,189.19
Intermediate Care 3 (IC3)	20,759.61	29,598.94	21,786.06	29,000.83	21,091.78	28,395.42
Extended Care (EC)	28,529.36	41,483.97	33,579.41	41,022.56	28,258.70	41,102.53

Source: Hollander and Chappell, 2007[160]

In New Zealand, Ernst & Young recently completed a review of the current aged residential care system.[86] Total costs were provided per care category in example locations as part of a financial model undertaken in 2018 (see Figure 24). As with the Canadian data, no comparisons are possible here as no data were provided prior to the implementation of the case mix system. The total costs are depicted in Figure 24. Across the four example locations, one can see that costs are consistently higher for two care categories: continuing care and psychogeriatric. According to this review, the primary drivers for differences in costs are:[86]

- Cost of land per square metre, which varies significantly depending on location
- Construction costs per square metre, which vary by location, and
- Differences in care hours for level of care.

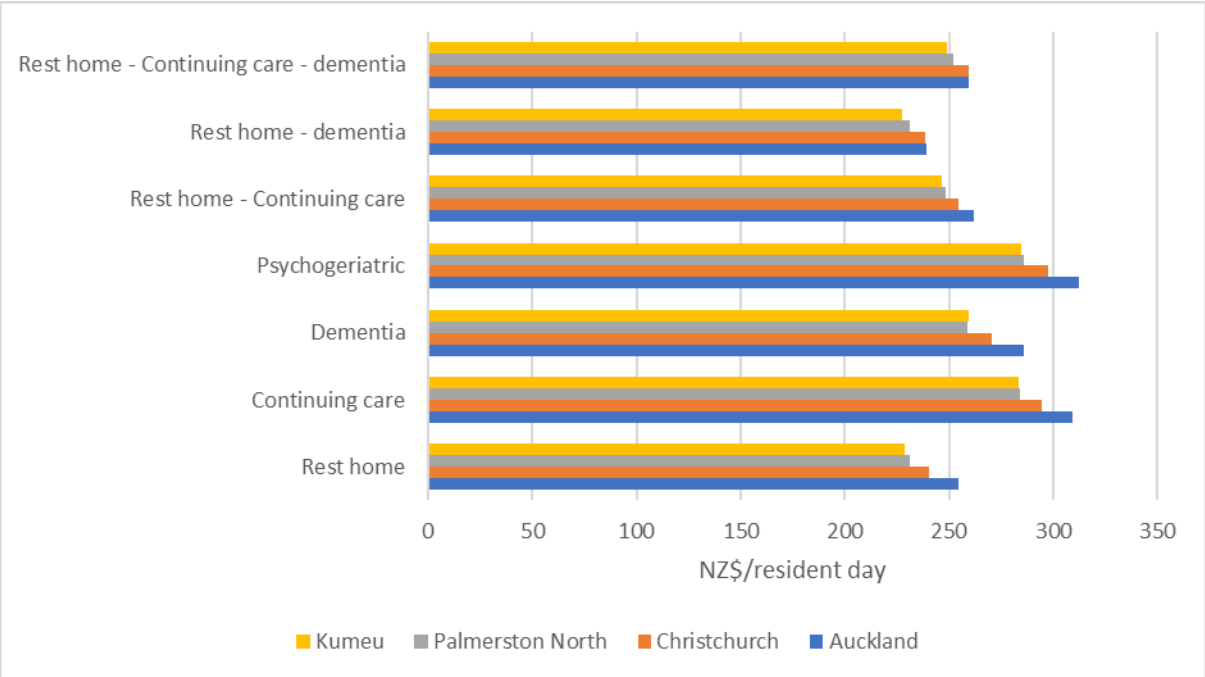

Figure 24 Total costs of aged residential care in New Zealand, by care category

Source: Analysis by Ernst & Young, 2019[86]

4.7.2 Profits

With regard to information on profitability, data were only available within the USA. Three studies examined profits before and after case mix implementation under Medicaid in the USA.[126,149,188] Two of these studies reported margins for nursing homes[126,149] and one reported margins for long-term care facilities.[188]

Swan and Pickard examined nursing home operating margins in Texas, Minnesota, and South Carolina before and after case mix implementation, and found that margins increased in both Texas and Minnesota. On the other hand, operating margins in South Carolina tended to be negative even before case mix implementation, and fell further behind costs after implementation of case mix (Table 54).[126]

Table 54 Swan 2003 nursing home operating margins before and after case mix reimbursement

	Overall facility average operating margins (% of revenue)	
State	**Before (year)**	**After (year)**
Texas	2.5 (1988)	7.3 (1991)
Minnesota	5.9 (1984)	15.6 (1988)
South Carolina	−0.7 (1986)	−2.8 (1988)

Source: Swan and Pickard, 2003[126]

Davis *et al.* performed regression analyses to examine the effect of case mix-adjusted reimbursement policy and market factors on nursing home performance in Kentucky, USA (Appendix F). They found that patients who required more care (higher patient acuity) seemed to be more profitable following the introduction of case mix reimbursement. The study authors suggest that greater reliance on poor-quality nursing practices increased the homes' capacity to manage heavy-care patients more cheaply.[149]

Schultz *et al*. examined operating margins in long-term care facilities before and after case mix implementation in New York (1986).[188] They found that operating margins increased following case mix implementation, but then fell below those pre-case mix implementation (Table 55).

Table 55 Schultz 1994 long-term care facility operating margins before and after case mix reimbursement

	Operating margin (% of revenue)		
State	**Before (1983)**	**After (1986)**	**After (1990)**
New York	0.00	1.00	−0.16

Source: Schultz *et al.*, 1994[188]

Schlenker examined profits in states in the USA with case mix-based Medicaid reimbursement systems (Maryland, Ohio, and West Virginia) versus states with different payment systems, including 'facility-specific' systems in Colorado and Florida and 'class-rate' in Texas and Utah. The author found that there were higher profits in case mix and facility-specific states than in class-rate states (

Table 56). The author suggested that higher profits in the case mix and facility-specific systems were obtained through a combination of higher non-Medicaid revenues and lower participation in Medicaid (i.e. lower Medicaid shares). In essence, it appears that high-profit nursing homes achieved their higher profits outside the Medicaid system.[187]

Table 56 Schlenker 1991 profits under case mix versus other reimbursement systems

State by reimbursement system	Profit ratio (revenue/expense)
Case mix system	
Maryland	1.08
Ohio	1.07
West Virginia	1.03
Facility-specific	
Colorado	1.06
Florida	1.04
Class-rate	
Texas	0.95
Utah	0.86

Source: Schlenker, 1991[187]

4.7.3 Efficiency

Only one study in the USA reported data on efficiency. Davis *et al*. performed regression analysis to explore the effect of the case mix-adjusted reimbursement policy under Medicaid and market factors on nursing home performance in the USA (Appendix F). The regression analysis showed no direct impact of case mix reimbursement on efficiency.[149]

4.7.4 Payment rates

Data on payment rates were only available in the USA, with two studies reporting on Medicaid reimbursement rates.[187,189]

Schlenker examined payment rates in states in the USA with case mix-based Medicaid reimbursement systems (Maryland, Ohio, and West Virginia) versus states with different payment systems, including 'facility-specific' systems in Colorado and Florida and 'class-rate' in Texas and Utah. Akin to cost and profit data, the author found that Medicaid rates were higher for case mix and facility-specific states than class-rate states (Table 57). Schlenker also performed a regression analysis, which found a strong positive association between case mix and the Medicaid payment rate under a case mix system, and weaker positive associations under the facility-specific and class-rate systems (Appendix F).[187]

Table 57 Schlenker 1991 payment rates under case mix versus other reimbursement systems

State by reimbursement system	Medicaid rate per day (in US$)
Case mix system	
Maryland	46.88
Ohio	41.63
West Virginia	46.85
Facility-specific	
Colorado	38.09
Florida	54.02
Class-rate	
Texas	33.02
Utah	38.27

Source: Schlenker, 1991[187]

Swan *et al*. examined state average Medicaid reimbursement rates for SNFs before and after case mix reimbursement from 1981 to 1989. We can see from the data in Table 58 that reimbursement rates increased following case mix implementation for most states. However, the study made no claim that this was a direct impact of case mix implementation. The authors also performed a regression analysis which found that neither case mix nor its interaction has a significant effect on the inflation-adjusted reimbursement rate measure (Appendix F). This suggests that there is no evidence that case mix systems allow closer control of rates. According to Swan *et al*., "case mix epitomizes systems adopted by states, to create incentives for facilities to admit high-cost patients and to adjust payment more closely to appropriate costs rather than for cost constraint."[189(p127)]

Table 58 Swan 1993 Medicaid reimbursement rates pre- and post-case mix reimbursement introduction

	Medicaid SNF average per diem reimbursement rate (in US$)								
State	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**
Delaware	(PRE) 41.59	(PRE) 44.49	(PRE) 39.58	(PRE) 39.58	(PRE) 47.53	(PRE) 47.53	(PRE) 50.35	(PRE) 60.45	(POST) 65.21
Maryland	(PRE) 36.14	(PRE) 39.53	(POST) 44.41	(POST) 47.59	(POST) 49.01	(POST) 51.89	(POST) 54.05	(POST) 57.57	(POST) 61.23
Minnesota	(PRE) 44.81	(PRE) 47.36	(PRE) 51.32	(PRE) 53.76	(PRE) 56.23	(POST) 57.47	(POST) 62.28	(POST) 64.23	(POST) 68.31
Missouri	(PRE) 30.00	(POST) 35.00	(POST) 40.00	(POST) 39.79	(POST) 43.86	(POST) 44.28	(POST) 45.29	(POST) 46.10	(POST) 46.95
Montana	(PRE) 36.75	(POST) 39.58	(POST) 40.08	(POST) 41.15	(POST) 44.31	(POST) 45.96	(POST) 47.84	(POST) 49.21	(POST) 50.86
Nebraska	(PRE) 41.23	(PRE) 44.64	(PRE) 49.27	(PRE) 42.68	(PRE) 48.42	(POST) 53.20	(POST) 55.66	(POST) 58.23	(POST) 61.91
New York	(PRE) 67.63	(PRE) 73.98	(PRE) 78.70	(PRE) 84.06	(PRE) 96.72	(POST) 92.90	(POST) 96.80	(POST) 103.41	(POST) 112.93
South Carolina	(PRE) 44.25	(PRE) 40.77	(PRE) 40.77	(PRE) 42.29	(PRE) 44.33	(PRE) 40.75	(POST) 41.75	(POST) 43.72	(POST) 47.50
Texas	(PRE) 33.66	(PRE) 35.67	(PRE) 38.25	(PRE) 40.19	(PRE) 41.65	(PRE) 44.05	(PRE) 45.48	(PRE) 47.80	(POST) 49.16

Source: Swan *et al*., 1993[189]

4.7.5 Mismatched payment rates and costs

Four studies in the USA provided data on mismatched payment rates and costs under Medicare and Medicaid. Two studies reported rates under Medicare,[185,186] and two studies reported rates under Medicaid.[142,184]

The Office of the Inspector General and Department of Health and Human Services examined improper payment rates in four states with large Medicare expenditures (California, Illinois, Texas, and New York) under the interim payment system (IPS) which came into effect in 1997. This review compared the current audit of home health agency claims in fiscal year 1998 with a prior audit of fiscal year 1996 (

Table 59). The report found that the error rate in home health claims in 1998 had been significantly reduced in comparison with the error rate found in 1996, but was still far too high. The authors suggested that these errors should be accounted for in rate-setting methods.[185]

Table 59 Total results of home health claims audit in 1996 and 1998

	Number of claims	Sample size	Value of sample (in US$)	Number of errors	Value of errors (in US$)
1996	4,787,911	250	374,143.19	146	146,130.84
1998	2,399,413	250	267,698.65	90	82,607.38

Source: Adapted from Office of the Inspector General and Department of Health and Human Services, 1999[185]

Another report by the Office of the Inspector General and Department of Health and Human Services examined costs and Medicare payment rates in SNFs. It found that Medicare payments for therapy greatly exceed SNFs' costs for therapy (Table 60). The authors stated that SNFs increasingly billed for higher-paying RUGs, even though key beneficiary characteristics remained largely the same.[186]

Table 60 Average payment and cost for therapy per day per beneficiary, by level of therapy, fiscal year 2012

Level of therapy	Average payment per day (in US$)	Average cost per day (in US$)	Difference between average payment and cost per day (in US$)
Ultra-high	231.00	165.00	66.00
Very high	156.00	111.00	45.00
High	104.00	74.00	30.00
Medium	67.00	48.00	19.00
Low	37.00	26.00	11.00

Source: Office of the Inspector General and Department of Health and Human Services, 2015[186]

Arling *et al*. examined the direct care resource use of nursing home residents based on the RUG-III classification system and other resident- and unit-level explanatory variables in four states: Colorado, Indiana, Minnesota, and Mississippi.[142] They found that their study's estimates of direct care rates differed dramatically from the Centers for Medicare & Medicaid Services' (CMS's) study rates, upon which the RUG-III case mix index (CMI) scores are based (

Table 61). This could have a major impact on nursing home payments, because if the CMIs over- or underestimate the cost of care for certain case mix groups, then providers may have an incentive to admit residents in certain groups and not others.[142]

Table 61 Comparison of direct care rates by RUG-III categories

RUG-III category	Number of study residents	CMS CMI	Study CMI	Difference between CMS CMI and study CMI	CMS direct care rate (in US$)	Study direct care rate (in US$)	Difference between CMS rate and study rate (in US$)
Special Extensive	193	1.828	1.383	−0.445	137.10	103.75	−33.35
Rehabilitation	453	1.343	1.292	−0.051	100.69	96.88	−3.81
Special Care	403	1.364	1.190	−0.174	102.30	89.22	−13.08
Clinically Complex	882	1.098	1.028	−0.070	82.38	77.13	−5.25
Impaired Cognition	945	0.796	0.809	0.013	59.700	60.680	0.980
Behavioural Problems	59	0.702	0.769	0.067	52.650	57.690	5.040
Physical	2,379	0.858	0.952	0.094	64.340	71.420	7.080

Key: CMI=case mix index; CMS=Centers for Medicare & Medicaid Services; RUG-III=third version of the Resource Utilization Groups

Source: Arling *et al.*, 2007[142]

Nyman and Connor estimated the marginal costs of different patient types under Minnesota's case mix system and compared them to their corresponding Medicaid reimbursements.[184] Akin to Arling *et al.*, they found that the Minnesota Medicaid case mix payments may have overestimated costs for some case mix groups and underestimated costs for other groups, leading to the selective admission of residents in more profitable groups. Please see the relevant regression analyses in Appendix F.

4.7.6 Medicare

A number of MedPAC reports provided data on total Medicare spending and margins for SNFs, home health agencies, and long-term care hospitals from the mid-1990s to 2018..[115,164-182]

4.7.6.1 Medicare spending

Medicare spending of SNFs is presented in Figure 25. The prospective payment system (PPS) for SNFs was introduced in 1998, and Figure 25 shows that there is a small initial decrease in spending in 1999, before a steady increase until 2010. Spending peaked in 2011, before decreasing somewhat and reaching a plateau. No data was available for 2004 or 2007.

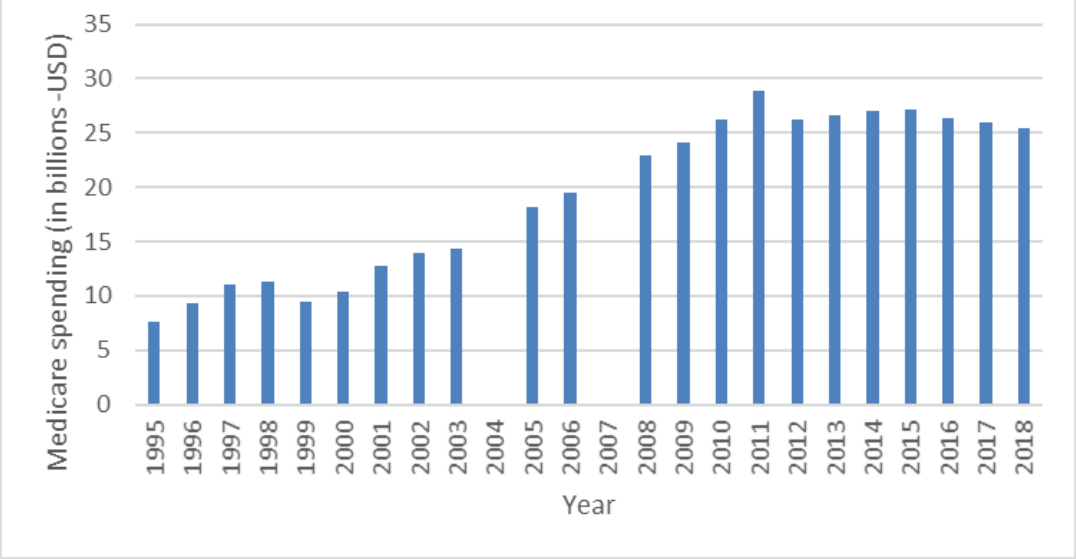

Figure 25 Medicare spending of SNFs from 1995 to 2018

Source: MedPAC reports[115,164-182]

Medicare spending of home health agencies is presented in Figure 26. The PPS for home health agencies was implemented in 2000. As there were no data available for the years 1998, 1999, and 2001, it is difficult to draw clear conclusions from the graph regarding initial changes. From the data we have, we can see that there was a large decrease in spending between 1997 and 2000. Following implementation, there was a steady increase in spending until 2009, after which spending plateaued.

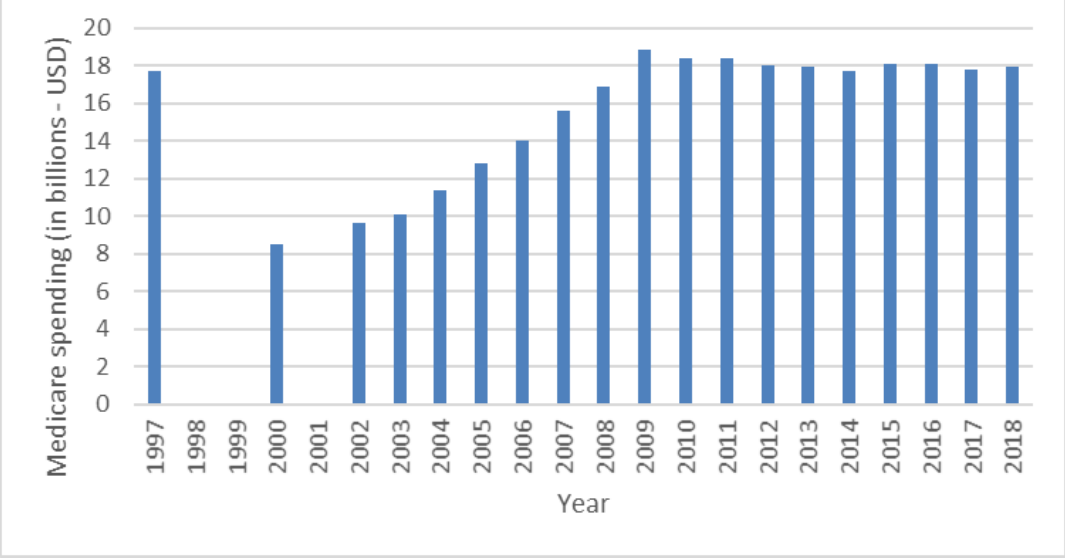

Figure 26 Medicare spending of home health agencies from 1997 to 2018

Source: MedPAC reports[115,164-182]

Medicare spending of long-term care hospitals is presented in Figure 27. The PPS for long-term care hospitals was introduced in 2002. There was a steady increase in spending immediately following implementation, which slowed and plateaued between 2011 and 2016.

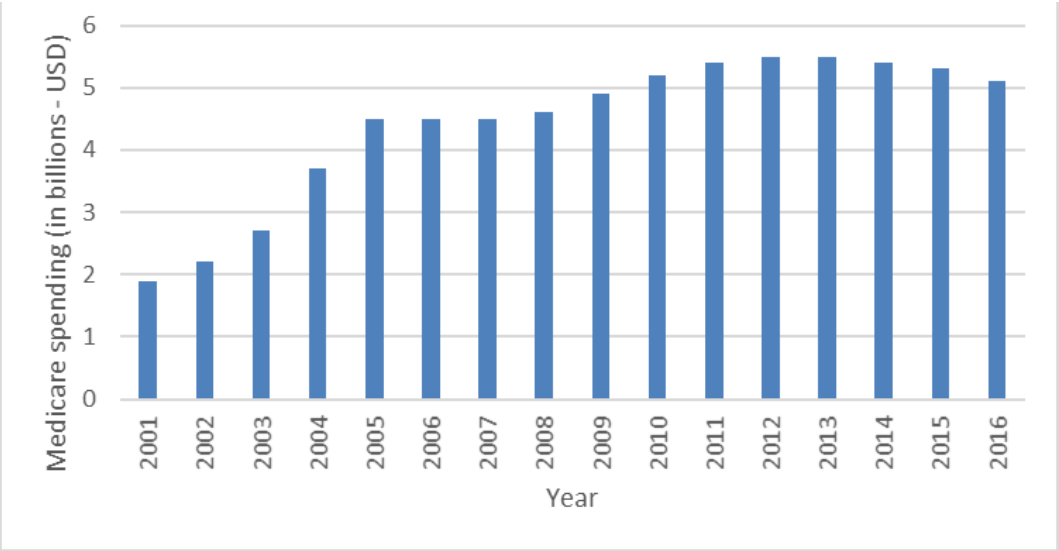

Figure 27 Medicare spending of long-term care hospitals from 2001 to 2016

Source: MedPAC reports[115,164-182]

4.7.6.2 Medicare margins

Medicare margins of skilled nursing homes are presented in Figure 28. As stated in Section 3.6.1.3, the PPS for SNFs was introduced in 1998. Unfortunately, no data were available before the year 2000, so no comparisons are possible pre/post implementation. Figure 28 shows that Medicare margins have varied over the years, reaching their highest in 2001 and 2002 and again in 2011, before decreasing and plateauing between 2012 and 2018.

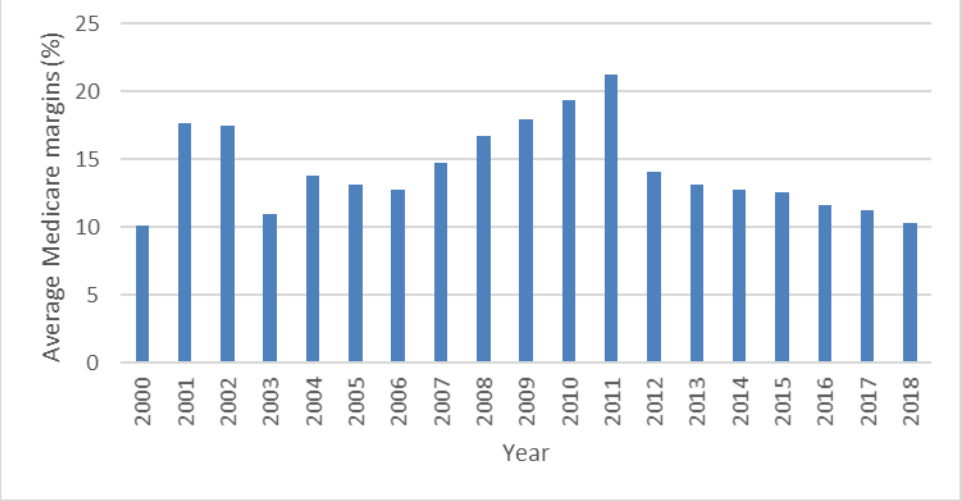

Figure 28 Medicare margins for SNFs from 2000 to 2018

Source: MedPAC reports[115,164-182]

Medicare margins of home health agencies are presented in Figure 29. The PPS was introduced for home health agencies in the year 2000. Similar to the SNF data, no figures were available prior to 2001, preventing comparisons prior to implementation. Data was also unavailable for 2002. Again, the margins have varied over the years, reaching their highest in 2010 and plateauing between 2016 and 2018.

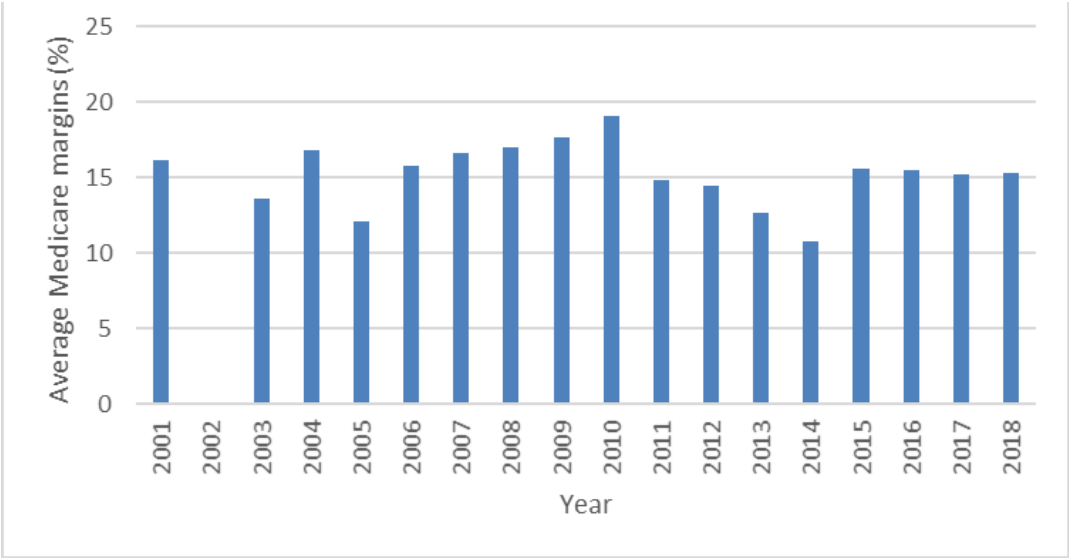

Figure 29 Medicare margins for home health agencies from 2001 to 2018

Source: MedPAC reports[115,164-182]

Medicare margins for long-term care hospitals are provided in Figure 30. In contrast to SNFs and home health agencies, data were available for a number of years prior to the implementation of the PPS in long-term care hospitals in 2002, enabling some basic comparisons. Here, we can see that Medicare margins were negative until 2003, the year immediately following the introduction of the PPS. Margins grew steadily until 2005, then began to decrease. As of 2017 and 2018, Medicare margins returned to negative figures, similar to those prior to the implementation of the PPS.

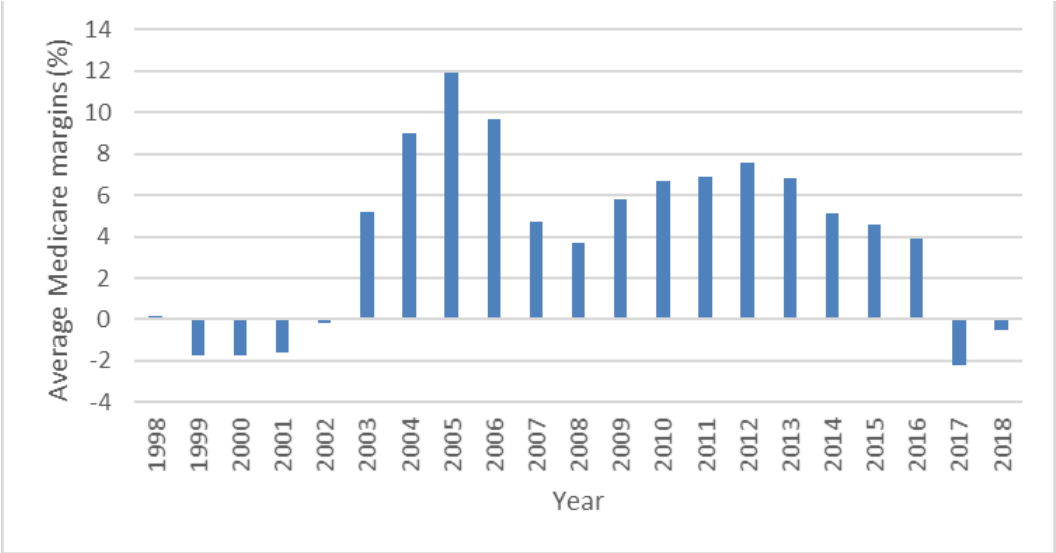

Figure 30 Medicare margins for long-term care hospitals from 1998 to 2018

Source: MedPAC reports[115,164-182]

4.8 Response to evaluation

What changes have been made in response to these evaluations?

In this section we describe any government responses to the evaluations we described in Sections 4.2 to 4.7. This section is organised according to country, and as we have no evaluations pertaining to Germany, this country is not included in this section.

4.8.1 Australia

Although Australia is in the process of reforming its residential aged care services, we did not find a direct link between the evaluations identified in this systematic review and the reforms.

4.8.2 Canada

We identified evaluations from three Canadian provinces: Alberta, British Columbia, and Quebec.

Alberta Health Services commissioned the review conducted by Sutherland *et al.*[46] We did not find an official government response to this report.

In British Columbia, we did not find any direct response to the evaluations identified in this systematic review.

The evaluations we identified for Quebec all related to the Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA) model, which is a model of integrated care based on coordination. The PRISMA model has six components: (1) coordination between decision-makers and managers at the regional and local level; (2) a single entry point; (3) a case management process; (4) an individualised service plan; (5) a single assessment instrument coupled with a management system; and (6) a computerised clinical chart.[203] Therefore, only part of the model is relevant to this research question. The model was introduced as part of a pilot programme, and as it was successful, it has been adopted by the Quebec Government. In a 2015 publication it was reported that, "Today the PRISMA project does not exist per se; it is part of a Quebec-wide programme called Réseau de Services Intégrés aux Personnes Âgées (RSIPA) which has become the normal system of care for the elderly in Quebec."[204(p2)]

4.8.3 New Zealand

In New Zealand, we did not find any direct response to the evaluations identified in this systematic review.

4.8.4 The Netherlands

We did not find a direct link between the evaluations from the Netherlands described in Sections 4.2 to 4.7 and any response from the government.

4.8.5 USA

We did not find a direct link between the Medicaid reports described in Sections 4.2 to 4.7 and any response from the government.

MedPAC is an independent government agency established by the Balanced Budget Act of 1997, which also established the PPS. MedPAC advises the US Government on payments to be made through the Medicare programme and is tasked with analysing access to care, quality of care, and other issues affecting Medicare.[164]

The MedPAC reports described in Sections 4.2 to 4.7 have led to a change in the case mix reimbursement system. As outlined in the MedPAC 2020 report, there have been two major changes as a result of MedPAC's analysis. Medicare payments for SNFs and home health agencies have been high relative to the cost to treat beneficiaries, and each year, MedPAC has recommended lowering or maintaining the base payment rates, which has been accepted by the government. Secondly, for rate year 2020, the Centers for Medicare & Medicaid Services have overhauled the payment systems

Medicare uses to pay home health agencies and SNFs, consistent with past MedPAC recommendations.[115]

5 Discussion

5.1 Summary of findings

We examined care band classification systems for home care and long-term residential care in six case countries. In Australia, care bands are used for both home care and long-term residential care. However, the same system is not shared across the two settings. In Alberta, Canada, a care band classification system is only used in the long-term residential care setting.

In Germany, the same care band classification system is used across home and long-term residential care. In New Zealand, care bands are only used for residential care as of December 2020; however, a care band classification system is in development for home care, due to be implemented by July 2022.

In the Netherlands, there is one system for long-term care, where patients who require 24-hour supervision (be it in home or residential care) are catered for. There are plans to implement a care band system for those who require less than 24-hour supervision in the home.

In the USA, for both Medicare (which is clinically oriented) and Medicaid, there are care band classification systems for home care and long-term residential care. However, these classification systems are not shared across systems.

Most case mix classification systems are not used across home care and long-term residential care settings.

We identified and described the main national care band classification systems for the general adult population availing of home care or long-term residential care in each case country. The focus of the care band systems was generally on older adults (65 years of age and over); however, the same classification system was often used for younger adults with long-term care needs (Alberta, Canada, Germany, the Netherlands, and the USA (both Medicare and Medicaid in Minnesota)). It is possible that some care band systems are also in use for adults with particular conditions or particular needs in our case countries; however, they were not the focus of this evidence review.

The case mix classification systems identified have gone through several updates; for example, in Australia, we have seen at least three classification systems in place,[155] and Medicare in the USA has developed a new Patient-Driven Groupings Model to be implemented from 2020.[123]

We identified 46 evaluations reported in 65 reports that assessed the service user, health system, and Exchequer experience of resource allocation through care bands. The outcomes extracted from the evaluation included service user outcomes, equity, delivery of care at the lowest level of complexity, and costs. In critical appraisal, 20 of the 46 studies were considered of weak quality and 25 were considered moderate, with only 1 study receiving a strong rating. Study design was generally poor, with 41 studies receiving a weak rating on this criterion.

5.1.1 Servicer user outcomes

Service user health outcomes and quality of care measures appeared to be relatively robust to changes in reimbursement models in both residential and home health settings. Utilisation of services appeared to generally remain stable or decline under case mix reimbursement, while patient satisfaction also remained stable or improved. American studies suggested that case mix reimbursement incentivised more equitable access to therapy, such that increased numbers of patients received some moderate amount of therapy in SNFs. However, there is also some evidence that financial incentives do impact on clinical practice and decision-making, serving as an important reminder that these decisions are seldom made without regard to financial resources.

The relative lack of impact of changes to Medicare and Medicaid in the USA on outcome and process measures of quality of care are important to consider in some detail. A number of authors note that changes to reimbursement in programmes like Medicare and Medicaid do not occur in a vacuum, as most facilities and agencies receive funding from multiple sources. Konetzka *et al.*[162] describe how high margins from private-pay and Medicare patients are used to subsidise Medicaid margins, which are lower; changes to Medicare funding, particularly those that lead to reductions in subsidies, therefore impact on all patients, not only those funded by Medicare: “With a financial shock to

Medicare revenues…it makes sense that the long-stay, largely Medicaid residents would be affected because the ability to cross-subsidize becomes limited".[162(p271)] Of the eight studies presented examining care practices and processes (see Section 4.4.4), the six concerned with changes to Medicaid funding did not generally find changes in quality of care measures. It is possible that changes or reductions in Medicaid in these studies were 'cushioned' by revenue from Medicare and private patients in this way, leading to a relative lack of change in quality measures observed in these studies. Similarly, Bowblis and Applebaum[144,145] suggest that reserve funds may be used to offset anticipated changes in revenue when a new price structure is introduced, protecting quality of care. This may be the case in particular for for-profit facilities; Unruh *et al.*[194] found that quality measures were most robust to changes in these facilities, perhaps owing to the availability of reserve funds.

5.1.2 Equity

In the Netherlands, although there was some relationship between income and home care or residential care, on the whole the Dutch care banding system seemed effective at restricting socioeconomic inequity with regard to aged care.[151,190,191]

For Medicaid in the USA, in the 1980s and 1990s attempts were made to reduce the problem of patients with heavy care needs not getting into nursing homes by introducing case mix classification systems.[153] While some improvements were made, there was still a problem in equity of access for those in the heaviest care requirement category.

There was little evidence to suggest that the Medicare PPS had any impact on access to home healthcare when examined through the MedPAC reports.[115,164-182] However, in the early 2000s, there was also some evidence that rural beneficiaries of Medicare had better access to care than their urban counterparts.

5.1.3 Delivery of care

This systematic review also considered whether there was any evidence that more care was being provided at the lowest level of complexity (i.e. in the community) due to the introduction of care band classification systems.

It was difficult to identify evidence on this outcome, as most studies were from countries that do not share a classification system across settings; it is therefore hard to tell if patients are being treated in a more appropriate location when data from only one setting are presented. The majority of data on this topic came from the proxy outcomes of change in resident dependency and change in case mix.

In Canada, Australia, and New Zealand, although there has been a move towards community care over time, this is not directly attributable to case mix classification.[146,155,160] Two studies looked at trends before introduction of case mix and saw that a move to community care was already present.[146,160] They found that this move was driven by policy recommending and encouraging this move to the community, and by the availability of resources in the community. One of these studies was conducted in British Columbia, a region that shares its system across home and residential care settings, and so this study has particularly strong evidence for this outcome.

Evaluations from the USA have shown the presence of 'case mix creep'. Case mix creep is the purposeful selection and classification of patients into the most profitable case mix index groups. The most profitable groups, relative to their costs, were identified as the high and medium care (but not the ultra-high care) case mix groups, and so those with the greatest need for care were still having difficulty gaining access. There was also some evidence that facilities were not fully prepared for the increased acuity of patients, resulting in increased hospitalisation.[141]

5.1.4 Costs

The majority of cost, profit, and payment rate data were USA-based, in relation to the Medicaid reimbursement system. Overall, costs, profits, and payment rates increased following implementation of case mix reimbursement systems, and case mix reimbursement methods tended to have higher costs than other methods. Both Medicare and Medicaid reimbursement rates are often mismatched to costs, and these errors should be accounted for in rate-setting methods. Medicare spending for all facility types steadily increased following PPS implementation before coming to a plateau in recent years, while margins have fluctuated greatly.

5.1.5 Policy impact

The US Government has established a dedicated commission, MedPAC, to review and advise it on issues relating to the Medicare insurance programme. While the remit of Medicare is much wider than home health and long-term residential care, MedPAC has provided feedback on the introduction of the PPS for home health and long-term residential care since its inception. The feedback from MedPAC was instrumental in the development of the latest Patient-Driven Groupings Model described in Section 3.6.[123]

We also identified the impact of evaluations on policy in Quebec, Canada. The Program of Research to Integrate Services for the Maintenance of Autonomy (PRISMA) model of integrated care, based on coordination, incorporates a case mix classification system. The model was piloted in the 2000s and ultimately adopted as the normal system of care for the elderly in Quebec.

5.2 Relation to other reviews

A systematic review by van den Bulck *et al*., published in 2020, aimed to identify existing scientific evidence on the configuration of international case mix models developed and/or implemented for prospective payment of home healthcare.[2] van den Bulck *et al*. focused on home care only, did not search for evaluative evidence, and did not restrict their search to models that were actually implemented, and so our evidence review presents quite different results. As of the end of 2020, we are not aware of any other systematic review which compares the impact of introducing care band classification on the allocation of resources in home care or long-term residential care.

5.3 Strengths and limitations

This report provides a comprehensive overview of the care band classification systems in operation in the six selected countries. The systematic review highlights the impact of care band classification systems that have been implemented since the 1980s.

The main limitation of this review was the availability of English-language studies. This evidence review was limited to English-language publications, which was due to the technical nature of the subject under review and the fact that professional translation was not an option due to budgetary restrictions.

We also identified a limitation of the general literature available in this area. The studies included in this review were mostly cross-sectional in design; there were limited data collected before and after the system change; and counterfactuals were typically one other year of data. This, coupled with the proportion of 'weak' studies (identified by the Effective Public Healthcare Panacea Project's Quality Assessment Tool for Quantitative Studies) leads us to conclude that there is a very low level of certainty about the evidence using the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) approach.[205]

5.4 Future research

The review has identified a number of areas that would benefit from further research. First, the mechanisms by which case mix classification systems effect change constitute an important area for further study. Case mix classification systems likely have both direct and indirect effects on outcomes for service users, providers and broader healthcare systems, mediated by changes in financial incentives, appropriateness of intervention choice, and phenomena such as case mix creep. These mediational relationships are important to understand as policy makers develop systems for implementation in new jurisdictions.

Second, the review has highlighted the potential for new funding models to have unintended or deleterious consequences, giving rise to financial incentives that can influence access and care decisions or introduce phenomena such as case mix creep. These are important areas of focus for future research so that unintended effects can be mitigated in future systems.

Finally, given the relatively low critical appraisal scores received by many studies included in the review and preponderance of cross-sectional studies, future research will benefit from more rigorous methodologies. While randomised controlled trials are likely to be difficult to implement to examine

large-scale system changes of this nature, quasi-experimental designs and interrupted time series studies may provide valuable insights into the effects of classification systems.

5.5 Conclusions

In some countries, costs for case mix reimbursement increased over time and tended to be higher than costs for other reimbursement systems. There was little impact on equity, service user outcomes, or quality of care. While there is better access for clinically complex patients, this is not the case for those with the most complex care needs. Any new care band system to be developed would need to take careful consideration of the unintended consequences identified in this review – in particular, case mix creep.

References

1. Government of Ireland. Sláintecare Implementation Strategy. 2018. Available from: https://www.gov.ie/en/publication/0d2d60-slaintecare-publications/#slaintecare-implementation-strategy
2. van den Bulck AOE, de Korte MH, Elissen AMJ, et al. A systematic review of case-mix models for home health care payment: Making sense of variation. *Health Policy*. 2020;124(2):121-32.
3. Guthrie DM, Poss JW. Development of a case-mix funding system for adults with combined vision and hearing loss. *BMC Health Serv Res*. 2013;13:137.
4. InterRAI. InterRAI: Long-term care facilities (LTCF). 2020. Available from: https://www.interrai.org/long-term-care-facilities.html
5. Elissen AMJ, Verhoeven GS, de Korte MH, et al. Development of a casemix classification to predict costs of home care in the Netherlands: a study protocol. *BMJ Open*. 2020;10(2):e035683.
6. Coyle C, Buggy S, Cagney O, et al. Housing with support for older people. An evidence review. Dublin, Ireland: Health Research Board; 2021:201pp. Available from: https://www.hrb.ie/publications/publication/housing-with-support-for-older-people/returnPage/1/
7. Fries BE, Schneider DP, Foley WJ, et al. Refining a case-mix measure for nursing homes: Resource Utilization Groups (RUG-III). *Med Care*. 1994;32(7):668-85.
8. Koster J. PubMed PubReMiner [Internet]. 2014. Available from: https://hgserver2.amc.nl/cgi-bin/miner/miner2.cgi
9. Effective Public Healthcare Panacea Project. Quality assessment tool for quantitative Studies. 2021. Available from: https://www.ephpp.ca/quality-assessment-tool-for-quantitative-studies/
10. Tikkanen R, Osborn R, Mossialos E, et al. International health care system profiles. Australia. 2020. Available from: https://www.commonwealthfund.org/international-health-policy-center/countries/australia (accessed 1 Dec 2020)
11. National Disability Insurance Agency. Plan budget and rules. 2021. Available from: https://www.ndis.gov.au/participants/creating-your-plan/plan-budget-and-rules
12. Parliament of Australia. Aged care: a quick guide. 2019. Available from: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1819/Quick_Guides/AgedCare2019
13. Royal Commission into Aged Care Quality and Safety. Financing aged care consultation paper 2. 2020. Available from: https://agedcare.royalcommission.gov.au/sites/default/files/2020-06/consultation_paper_2_-_financing_aged_care_0.pdf
14. Australian Government, Department of Health. Commonwealth home support programme. Program manual 2018–2020. 2019. Available from: https://www.health.gov.au/sites/default/files/documents/2019/12/commonwealth-home-support-programme-chsp-manual-2018-2020.pdf
15. Australian Government, Department of Health. Home Care Packages Program reforms 2020. Available from: https://www.health.gov.au/health-topics/aged-care/aged-care-reforms-and-reviews/home-care-packages-program-reforms
16. Rosewarne RC. Australian approaches to resident classification and quality assurance in residential care. *J Aging Soc Policy*. 2002;13(2-3):117-35.
17. Eagar K, McNamee J, Gordon R, et al. AN-ACC: A national classification and funding model for residential aged care: synthesis and consolidated recommendations: The Resource Utilisation and Classification Study. Report 6. 2019. Available from:

https://www.health.gov.au/resources/publications/resource-utilisation-and-classification-study-rucs-reports
18. Australian Government, Department of Health. Report on the trial of the Australian National Aged Care Classification (AN-ACC): Australian Government, Department of Health; 2020. Available from: https://www.health.gov.au/resources/publications/report-on-the-trial-of-the-australian-national-aged-care-classification-an-acc
19. Australian Government, Department of Health. Residential aged care funding reform. 2020. Available from: https://www.health.gov.au/health-topics/aged-care/aged-care-reforms-and-reviews/residential-aged-care-funding-reform
20. Australian Government, Department of Health. ACAT guidance framework for home care package level. 2018. Available from: https://www.health.gov.au/resources/publications/acat-guidance-framework-for-home-care-package-level
21. Australian Government, My Aged Care. Prepare for your assessment. [no date]. Available from: https://www.myagedcare.gov.au/assessment/prepare-your-assessment
22. Australian Government, My Aged Care. My Aged Care assessment manual for regional assessment services and aged care assessment teams. 2018. Available from: https://www.health.gov.au/sites/default/files/documents/2020/01/my-aged-care-assessment-manual.pdf
23. Australian Government, Department of Health. Home Care Packages Program operation manual: A guide for home care providers. 2020. Available from: https://www.health.gov.au/sites/default/files/documents/2020/03/home-care-packages-program-operational-manual-a-guide-for-home-care-providers.pdf
24. Australian Government, My Aged Care. What happens after assessment. [no date]. Available from: https://www.myagedcare.gov.au/assessment/what-happens-after-assessment (accessed 18 Nov 2020)
25. Australian Government, Department of Health. Aged care subsidies and supplements: new rates of daily payments from 20 September 2020. 2020. Available from: https://www.health.gov.au/sites/default/files/documents/2020/09/schedule-of-subsidies-and-supplements-for-aged-care-schedule-from-20-september-2020_0.pdf
26. Australian Government, My Aged Care. Home Care Package costs and fees. [no date]. Available from: https://www.myagedcare.gov.au/home-care-package-costs-and-fees (accessed 18 Nov 2020)
27. Australian Government, Department of Health. Subsidy reductions for residential aged care. 2020. Available from: https://www.health.gov.au/initiatives-and-programs/residential-aged-care/funding-for-residential-aged-care/subsidy-reductions-for-residential-aged-care (accessed 18 Nov 2020)
28. Australian Government, Department of Health. The aged care funding instrument. 2020. Available from: https://www.health.gov.au/initiatives-and-programs/residential-aged-care/funding-for-residential-aged-care/the-aged-care-funding-instrument-acfi
29. Australian Government, Department of Health. Aged Care Funding Instrument (ACFI) user guide. 2017. Available from: https://www.health.gov.au/resources/publications/aged-care-funding-instrument-acfi-user-guide
30. McNamee J, Poulos C, Seraji H, et al. Alternative Aged Care Assessment, Classification System and Funding Models Report Centre for Health Service Development, Australian Health Services Research Institute, University of Wollongong; 2017. Available from: https://www.health.gov.au/resources/publications/alternative-aged-care-assessment-classification-system-and-funding-models-report

31. Westera A, Snoek M, Duncan C, et al. The AN-ACC assessment model. The Resource Utilisation and Classification Study: Report 2 Australian Health Services Research Institute, University of Wollongong; 2019. Available from: https://ro.uow.edu.au/cgi/viewcontent.cgi?article=1974&context=ahsri
32. McNamee JP, Snoek M, Kobel C, et al. A funding model for the residential aged care sector. The Resource Utilisation and Classification Study: Report 5. Australia: Australian Health Services Research Institute, University of Wollongong; 2019. Available from: https://ro.uow.edu.au/cgi/viewcontent.cgi?article=1977&context=ahsri (accessed 18/11/2020)
33. Eagar K, Gordon R, Snoek MF, et al. The Australian National Aged Care Classification (AN‐ACC): a new casemix classification for residential aged care. *Med J Austral*. 2020;213(8):359-63.
34. Australian Government, My Aged Care. Aged care home costs and fees. [no date]. Available from: https://www.myagedcare.gov.au/aged-care-home-costs-and-fees (accessed 18 Nov 2020)
35. Loggie CL, McNamee JP, Gordon R, et al. AN-ACC Technical appendices. The Resource Utilisation and Classification Study: Report 7. Australia: Australian Health Services Research Institute, University of Wollongong; 2019. Available from: https://ro.uow.edu.au/cgi/viewcontent.cgi?article=1979&context=ahsri (accessed 18/11/2020)
36. Alberta Health Services. Senior living options assessment [no date]. Available from: https://www.albertahealthservices.ca/assets/info/pf/if-pf-cc-living-options-assessment.pdf
37. Canadian Institute for Health Information. RUG-III grouping methodology: Canadian Institute for Health Information,, 2016.
38. interRAI. Case-mix classification. 2021. Available from: https://www.interrai.org/classification.html (accessed 6/1/2021)
39. Canadian Institute for Health Information. Resource Utilization Groups III Home Care (RUG-III-HC) Job Aid. 2017. Available from: https://www.cihi.ca/sites/default/files/document/rug-iii-hc-jobaid-en.pdf
40. Alberta Health Services. Getting a case manager. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15484.aspx (accessed 23 Nov 2020)
41. Alberta Health Services. interRAI Resident Assessment Instrument - Home Care (RAI-HC) Alberta Health Services, 2016.
42. Alberta Health Services. Frequently asked questions. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15536.aspx (accessed 23 Nov 2020)
43. Alberta Health Services. Publicly funded and private for purchase care services. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15485.aspx (accessed 23/11/2020)
44. Alberta Health Services. Patient care-based funding. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15503.aspx (accessed 23 Nov 2020)
45. Alberta Health Services. Accessing continuing care. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15487.aspx (accessed 23 Nov 2020)
46. Sutherland JM, Repin N, Crump RT. The Alberta Health Services patient/care-based funding model for long term care. A review and analysis. 2013. Available from: https://www.albertahealthservices.ca/publications/ahs-pub-ltc-pcbf.pdf
47. Turner-Stokes L, Sutch S, Dredge R, et al. International casemix and funding models: lessons for rehabilitation. *Clinical rehabilitation*. 2012;26(3):195-208.

48. Canadian Institute for Health Information. How RUG-III (44 Group) case mix index values are calculated, 2011—CCRS technical document. 2011. Available from: https://www.cihi.ca/sites/default/files/document/ccrs_tech_rugiii_44_en.pdf
49. Alberta Health. Continuing care health service standards: Alberta Health, 2018.
50. Crump RT, Repin N, Sutherland JM. Reforming long-term care funding in Alberta. *Healthc Q*. 2015;18(1):26-31.
51. Alberta Health Services. Long term care. 2020. Available from: https://www.albertahealthservices.ca/cc/Page15491.aspx (accessed 23 Nov 2020)
52. Alberta Health Services. Continuing care accommodation charges. 2020. Available from: https://www.alberta.ca/continuing-care-accommodation-charges.aspx
53. Government of Alberta. Alberta Seniors benefit. 2020. Available from: https://www.alberta.ca/alberta-seniors-benefit.aspx#toc-4 (accessed 232020)
54. Nadash P, Doty P, von Schwanenflügel M. The German long-term care insurance program: evolution and recent developments. *Gerontologist*. 2018;58(3):588-97.
55. Evans Cuellar A, Wiener JM. Can social insurance for long-term care work? The experience of Germany. *Health Aff (Millwood)*. 2000;19(3):8-25.
56. Link S. Long term care reform in Germany – At long last. London, UK: Institute and Faculty of Actuaries,; 2018. Available from: https://www.actuaries.org.uk/system/files/field/document/Long%20term%20care%20reform%20in%20Germany%20%E2%80%93%20At%20long%20last.pdf
57. Der Bundestag. Erstes Gesetz zur Stärkung der pflegerischen Versorgung und zur Änderung weiterer Vorschriften (Erstes Pflegestärkungsgesetz - PSG I). *Bundesgesetzblatt*. 2014;61:2222-30.
58. Der Bundestag. Zweites Gesetz zur Stärkung der pflegerischen Versorgung und zur Änderung weiterer Vorschriften (Zweites Pflegestärkungsgesetz - PSG II). *Bundesgesetzblatt*. 2015;54:2424-63.
59. Der Bundestag. Drittes Gesetz zur Stärkung der pflegerischen Versorgung und zur Änderung weiterer Vorschriften (Drittes Pflegestärkungsgesetz - PSG III). *Bundesgesetzblatt*. 2016;65:3191-220.
60. Federal Ministry of Health. Germany's Long Term Care Strengthening Acts. 2016. Available from: https://www.bundesgesundheitsministerium.de/english-version/topics/long-term-care/germanys-long-term-care-strengthening-acts.html
61. Medizinischer Dienst der Krankenversicherung (MDK). Information on care needs assessments. 2020. Available from: https://www.mdk.de/versicherte/pflegebegutachtung/
62. Vanella P, Heß M, Wilke CB. A probabilistic projection of beneficiaries of long-term care insurance in Germany by severity of disability. *Qual & Quant*. 2020;54(3):943-74.
63. Bundesministerium der Justiz und für Verbraucherschutz. Sozialgesetzbuch (SGB) - Elftes Buch (XI) - Soziale Pflegeversicherung (Artikel 1 des Gesetzes vom 26. Mai 1994, BGBl. I S. 1014). 2020. Available from: https://www.gesetze-im-internet.de/sgb_11/BJNR101500994.html#BJNR101500994BJNG000200307
64. Bundesministerium für Gesundheit. Long term care guide: everything you need to know about long-term care. 2020. Available from: https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/5_Publikationen/Pflege/Broschueren/200320_BMG_Ratgeber-Pflege_DINA5_ENG_bf.pdf
65. Bundesministerium für Gesundheit. Pflegeversicherung. 2020. Available from: https://www.bundesgesundheitsministerium.de/themen/pflege/pflegeversicherung-zahlen-und-fakten.html#c3236
66. Doetter LF, Schmid A. Shared housing arrangements in Germany-an equitable alternative to long term care Services beyond homes and institutions? *Int J Environ Res Public Health*. 2018;15(2).

67. European Union. Peer review on “Germany’s latest reforms of the long-term care system”. Berlin, Germany, 11-12 January 2018. Synthesis report: European Union,; 2018. Available from: https://ec.europa.eu/social/main.jsp?catId=89&langId=en&newsId=9008&moreDocuments=yes&tableName=news
68. Medizinischer dienst des spitzenverbandes bund der krankenkassen (MDS), GKV-Spitzenverband. Richtlinien des GKV-Spitzenverbandeszur Feststellung der Pflegebedürftigkeitnach dem XI. Buch des Sozialgesetzbuches. 2019. Available from: https://www.mds-ev.de/fileadmin/dokumente/Publikationen/SPV/Begutachtungsgrundlagen/19-11-12_BRi_Pflege.pdf
69. Bundesministerium für Gesundheit. Pflegeberichte. 2020. Available from: https://www.bundesgesundheitsministerium.de/themen/pflege/pflegeversicherung-zahlen-und-fakten/pflegeberichte.html
70. Advisory Board for the Review of the Definition of the Need for Long-term Care. Implementation report by the Advisory Board to review the definition of the need for long-term care. 2009. Available from: https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/E/Englische_Dateien/Implementation_Report_by_the_Advisory_Board_to_Review_the_Definition_of_the_Need_for_Long-term_Care.pdf
71. Doetter LF, Rothgang H. Quality and cost-effectiveness in long-term care and dependency prevention. Country report. The German LTC policy landscape. Bremen: Cequa; 2017. Available from: https://www.cequa.org/copy-of-all-publications
72. Bahnsen L, Fetzer S, Franke F, et al. Gone with the windfall – Germany's Second LTC Strengthening Act and its intergenerational implications. *J Econom Ageing*. 2020;17:100254.
73. The Commonwealth Fund. New Zealand. 2020. Available from: https://www.commonwealthfund.org/international-health-policy-center/countries/new-zealand (accessed 15/10/2020)
74. Ministry of Health. Health of older people. Needs assessment. 2016. Available from: https://www.health.govt.nz/our-work/life-stages/health-older-people/needs-assessment (accessed 16 Nov 2020)
75. Ministry of Health. Home and community support services. 2020. Available from: https://www.health.govt.nz/your-health/services-and-support/disability-services/types-disability-support/home-and-community-support-services
76. Ministry of Health. Am I eligible for Ministry-funded support services? 2019. Available from: https://www.health.govt.nz/your-health/services-and-support/disability-services/getting-support-disability/am-i-eligible-ministry-funded-support-services
77. Ministry of Health. Demographic report for clients allocated the Ministry of Health’s disability support services. 2018 update. Wellington: Ministry of Health; 2019. Available from: https://www.health.govt.nz/system/files/documents/publications/demographic-report-for-client-allocated-ministry-of-health-disability-support_services-2018-update14nov2019.pdf
78. Ministry of Health. Information response h201901811: Response to your request for official information Wellington, New Zealand: Ministry of Health, 2019:39pp.
79. Sajtos L, Rouse P, Harrison J, et al. Case-mix system as a boundary object: the case of home care services. *Australas Mark J*. 2014;22(3):189-96.
80. Parsons M, Rouse P, Sajtos L, et al. Developing and utilising a new funding model for home‐care services in New Zealand. *Health Soc Care Community*. 2018;26(3):345-55.

81. Hirdes J, Curtin-Telegdi N, Poss J, et al. interRAI Contact Assessment (CA) form and user's manual: a screening level assessment for emergency department and intake from community/hospital. Version 9.2. 2010. Available from: https://catalog.interrai.org/content/interrai-contact-assessment-ca-form-and-user%E2%80%99s-manual-screening-level-assessment-emergency
82. Morris JN, Fries BE, Steel K, et al. Comprehensive clinical assessment in community setting: applicability of the MDS‐HC. *J Am Geriatr Soc*. 1997;45(8):1017-24.
83. Needs Assessment Services Co-ordination Association. Older peoples NASC services. [no date]. Available from: https://www.nznasca.co.nz/services/older-peoples-nasc-services/
84. Ministry of Health. Needs assessment and support services for older people. What you need to know. Wellington, New Zealand: Ministry of Health; 2011:24pp. Available from: https://www.health.govt.nz/system/files/documents/publications/support-services-older-plev2.pdf
85. Ministry of Health. National Framework for Home and Community Support Services (HCSS). Wellington, New Zealand: Ministry of Health,, 2020.
86. Ernst & Young. Aged residential care funding model review. 2019. Available from: https://tas.health.nz/assets/Health-of-Older-People/ARC-Funding-Model-Review-Final-Report.pdf
87. The University of Auckland. The development of a case-mix system for aged residential care. Public report. 2018. Available from: https://media.bupa.com.au/download/544969/casemixpublicreportmay2018.pdf
88. Central Region Technical Advisory Services (TAS). Age-related residential care services agreement. 2020. Available from: https://tas.health.nz/assets/Uploads/ARRC-Agreement-2020-21-effective-1-November-2020.pdf
89. PWC. Health Funding Authority aged residential care pricing implementation final report. : PWC,; 2000. Available from: https://www.moh.govt.nz/notebook/nbbooks.nsf/7086510ecd1c88e1cc2573b70071599b/69703600b76f281bcc257fed0072836c?OpenDocument
90. Ministry of Health. Funding of aged residential services consultation document. 2001. Available from: https://www.moh.govt.nz/notebook/nbbooks.nsf/0/2e83a6627e89fb92cc2577c7006e686a/$FILE/ConsultationDocument.pdf
91. Ministerie van Volksgezondheid, Welzijn en Sport. Wijkverpleging (verpleging en verzorging thuis). [no date]. Available from: https://www.informatielangdurigezorg.nl/onderwerpen/w/wijkverpleging
92. Ministerie van Volksgezondheid, Welzijn en Sport. Huishoudelijke hulp: welke wet? [no date]. Available from: https://www.informatielangdurigezorg.nl/onderwerpen/h/hulp-bij-het-huishouden
93. Kroneman M, Boerma W, van den Berg M, et al. Health Systems in Transition. The Netherlands: health system review. 2016. Available from: https://www.euro.who.int/__data/assets/pdf_file/0016/314404/HIT_Netherlands.pdf?
94. European Commission. Netherlands - Long-term care. [no date]. Available from: https://ec.europa.eu/social/main.jsp?catId=1122&langId=en&intPageId=4989
95. Zorginstituut Nederland. Wijkverpleging (18 jaar en ouder). 2020. Available from: https://www.zorginstituutnederland.nl/Verzekerde+zorg/wijkverpleging-zvw (accessed 10 Nov 2020)
96. Centrum Indicatiestelling Zorg (CIZ). Wat doet het CIZ? [no date]. Available from: https://www.ciz.nl/over-ciz/over-het-ciz

97. Zorginstituut Nederland. Toegang tot Wlz-zorg 2016. Available from: https://www.zorginstituutnederland.nl/Verzekerde+zorg/toegang-tot-wlz-zorg
98. Zorginstituut Nederland. Persoonlijke verzorging, begeleiding en verpleging (Wlz). 2020. Available from: https://www.zorginstituutnederland.nl/Verzekerde+zorg/persoonlijke-verzorging-begeleiding-en-verpleging-wlz (accessed 10 Nov 2020)
99. Eurocarers. Eurocarers country profiles. The Netherlands. [no date]. Available from: https://eurocarers.org/country-profiles/netherlands/ (accessed 25/08/2020)
100. Zorginstituut Nederland. Leveringsvormen (instelling, vpt, mpt en pgb) (Wlz). 2020. Available from: https://www.zorginstituutnederland.nl/Verzekerde+zorg/leveringsvormen-instelling-vpt-mpt-en-pgb-wlz (accessed 10 Nov 2020)
101. Ministerie van Volksgezondheid, Welzijn en Sport. Besluit langdurige zorg. Artikel 3.1.1 2020. Available from: https://wetten.overheid.nl/BWBR0035948/2020-01-01/#Hoofdstuk3_Paragraaf1_Artikel3.1.1
102. Centrum Indicatiestelling Zorg (CIZ). Beleidsregels indicatiestelling Wlz 2020 2020. Available from: https://www.ciz.nl/images/pdf/beleidsregels/Beleidsregels_indicatiestelling_Wlz_2020.pdf
103. Ministerie van Volksgezondheid, Welzijn en Sport. Bijlage A. bij artikel 2.1 van de Regeling langdurige zorg. 2020. Available from: https://wetten.overheid.nl/BWBR0036014/2020-07-14#BijlageA
104. Ministerie van Volksgezondheid, Welzijn en Sport. Wet langdurige zorg. 2020. Available from: https://wetten.overheid.nl/BWBR0035917/2020-03-19
105. Nederlandse Zorgautoriteit. Beleidsregel prestatiebeschrijvingen en tarieven zorgzwaartepakketten en volledig pakket thuis 2020 - BR/REG-20124c [Policy rule for performance descriptions and rates for care intensity packages and full package at home 2020 - BR/REG-20124c]. 2020. Available from: https://puc.overheid.nl/nza/doc/PUC_277076_22/4/
106. European Commission. The Netherlands. Health care and long-term care systems. An excerpt from the Joint report on Health care and long-term care systems fiscal sustainability, published in October 2016 as Institutional paper 37 volume 2 - country documents. 2016. Available from: https://ec.europa.eu/info/sites/info/files/file_import/joint-report_nl_en_2.pdf
107. European Commission. Joint Report on Health Care and Long-Term Care Systems and Fiscal Sustainability, . 2019. Available from: https://ec.europa.eu/info/publications/joint-report-health-care-and-long-term-care-systems-and-fiscal-sustainability-country-documents-2019-update_en
108. U.S. Centers for Medicare & Medicaid Services (CMS). What's Medicare? 2020. Available from: https://www.medicare.gov/what-medicare-covers/your-medicare-coverage-choices/whats-medicare
109. U.S. Centers for Medicare & Medicaid Services (CMS). Skilled nursing facility (SNF) care. 2020. Available from: https://edit.medicare.gov/coverage/skilled-nursing-facility-snf-care
110. U.S. Centers for Medicare & Medicaid Services (CMS). Home health services. 2020. Available from: https://edit.medicare.gov/coverage/home-health-services#
111. U. S. Department of Health and Human Services. State Medicaid programs. 2020. Available from: https://longtermcare.acl.gov/medicare-medicaid-more/medicaid/index.html
112. Ubokudom S, Woods JA, Schalk LS. The effects of case-mix reimbursement on Ohio Medicaid nursing home costs. *Policy Stud J*. 2002;30:321-42.

113. Weech-Maldonado R, Shea D, Mor V. The relationship between quality of care and costs in nursing homes. *Am J Med Qual*. 2006;21(1):40-8.
114. Schlenker RE, Powell MC, Goodrich GK. Initial home health outcomes under prospective payment. *Health Serv Res*. 2005;40(1):177-93.
115. Medicare Payment Advisory Commission (MedPAC). Report to the Congress. Medicare payment policy. . 2020. Available from: http://www.medpac.gov/docs/default-source/reports/mar20_entirereport_sec.pdf?sfvrsn=0
116. Medicare Payment Advisory Commission (MedPAC). Home health care services payment system. 2020. Available from: http://www.medpac.gov/docs/default-source/payment-basics/medpac_payment_basics_20_hha_final_sec.pdf?sfvrsn=0
117. Centers for Medicare & Medicaid Services, Department of Health and Human Services. CY 2019 Home health Prospective Payment System rate update and CY 2020 case-mix adjustment methodology refinements; home health value-based purchasing model; home health quality reporting requirements; home infusion therapy requirements; and training requirements for surveyors of national accrediting organizations. *Fed Regist*. 2019;83(219):56406-638.
118. U. S. Centers for Medicare & Medicaid Services (CMS), Medicare Learning Network (MLN). Overview of the Patient-Driven Groupings Model (article SE19027). 2019. Available from: https://www.cms.gov/files/document/se19027.pdf
119. U. S. Centers for Medicare & Medicaid Services (CMS), Medicare Learning Network (MLN). The role of therapy under the Home Health Patient-Driven Groupings Model (PDGM). 2020. Available from: https://www.cms.gov/files/document/se20005.pdf
120. Medicare Payment Advisory Commission (MedPAC). Skilled nursing facility services payment system. 2020. Available from: http://www.medpac.gov/docs/default-source/payment-basics/medpac_payment_basics_20_snf_final_sec.pdf?sfvrsn=0
121. National Cancer Institute, Division of Cancer Control & Population Sciences. SEER-Medicare: Minimum Data Set (MDS) - Nursing Home Assessment. 2020. Available from: https://healthcaredelivery.cancer.gov/seermedicare/medicare/mds.html#:~:text=The%20Minimum%20Data%20Set%20(MDS,functional%20capabilities%20and%20health%20needs.
122. Acumen. Skilled nursing facilities patient-driven payment model technical report. 2018. Available from: https://www.cms.gov/medicare/medicare-fee-for-service-payment/snfpps/downloads/pdpm_technical_report_508.pdf
123. Medicare Payment Advisory Commission (MedPAC). Long-term care hospitals payment system. 2020. Available from: http://www.medpac.gov/docs/default-source/payment-basics/medpac_payment_basics_20_ltch_final_sec.pdf?sfvrsn=0
124. U. S. Centers for Medicare & Medicaid Services (CMS), Medicare Learning Network (MLN). Long-term care hospital prospective payment system. 2020. Available from: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Long-Term-Care-Hospital-PPS-Fact-Sheet-ICN006956.pdf
125. Reinhard S, Houser A, Ujvari K, et al. Long-term services and supports State scorecard 2020 edition. Advancing action. 2020. Available from: http://www.longtermscorecard.org/~/media/Microsite/Files/2020/LTSS%202020%20Short%20Report%20PDF%20923.pdf
126. Swan JH, Pickard RB. Medicaid case-mix nursing home reimbursement in three states. *J Health Soc Policy*. 2003;16(4):27-53.
127. Caring, LLC. Financial assistance, costs & payment options for eldercare in Minnesota. 2020. Available from: https://www.payingforseniorcare.com/Minnesota

128. Caring, LLC. Minnesota Medicaid Elderly Waiver (EW) program: qualifications and services. 2020. Available from: https://www.payingforseniorcare.com/minnesota/medicaid-waivers/elderly-waiver
129. Minnesota Department of Human Services. Community-Based Services Manual (CBSM). MnCHOICES,. 2020. Available from: https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=DHS16_176044
130. Minnesota Department of Human Services. AC, BI, CADI, EW case mix classification worksheet [no date]. Available from: https://edocs.dhs.state.mn.us/lfserver/Public/DHS-3428B-ENG
131. Minnesota Department of Human Services. Community-Based Services Manual (CBSM). MnCHOICES certified assessors 2020. Available from: https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=DHS16_176043
132. Minnesota Department of Human Services. Community-Based Services Manual (CBSM). Assessment applicability and timelines. 2020. Available from: https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=dhs-291132#
133. Minnesota Department of Human Services. MnCHOICES reassessment rollout. Frequently asked questions. 2015. Available from: https://www.dhs.state.mn.us/main/groups/county_access/documents/pub/dhs16_195862.pdf
134. Minnesota Department of Human Services. Community-Based Services Manual (CBSM). Appeals process. 2020. Available from: https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=dhs-295972#
135. Minnesota Department of Human Services. The future of Elderly Waiver. 2019. Available from: https://mn.gov/dhs/assets/Future-elderly-waiver_tcm1053-350979.pdf
136. Minnesota Department of Human Services. Provider manual. Elderly Waiver (EW) and Alternative Care (AC) program. 2020. Available from: https://www.dhs.state.mn.us/main/idcplg?IdcService=GET_DYNAMIC_CONVERSION&RevisionSelectionMethod=LatestReleased&dDocName=id_056766
137. Minnesota Department of Human Services. Long-term services and supports service rate limits effective January 1, 2021. 2020. Available from: https://edocs.dhs.state.mn.us/lfserver/Public/DHS-3945-ENG
138. Punelli D. Long-term care services for the elderly. 2017. Available from: https://www.house.leg.state.mn.us/hrd/pubs/ltcelderly.pdf
139. Minnesota Department of Human Services. Minnesota case mix review manual. 2020. Available from: https://www.health.state.mn.us/facilities/regulation/casemix/docs/cmrmanual.pdf
140. Moher D, Liberati A, Tetzlaff J, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Med*. 2009;6(7):e1000097.
141. Arling G, Daneman B. Nursing home case-mix reimbursement in Mississippi and South Dakota. *Health Serv Res*. 2002;37(2):377-95.
142. Arling G, Kane RL, Mueller C, et al. Explaining direct care resource use of nursing home residents: findings from time studies in four states. *Health Serv Res*. 2007;42(2):827-46.
143. Botz CK, Bestard S, Demaray M, et al. Resource utilization groups (RUGs): defining chronic care, rehabilitation and nursing home case mix in Canada. *Healthc Manage Forum*. 1993;6(4):5-19.

144. Bowblis J, Applebaum R. How does Medicaid reimbursement impact the quality of Ohio nursing homes? . 2015. Available from: http://www.miamioh.edu/cas/_files/documents/scripps/publications/2015/05/medicaid_reimbursement_quality_impact.pdf
145. Bowblis JR, Applebaum R. How does Medicaid reimbursement impact nursing home quality? The effects of small anticipatory changes. *Health Serv Res*. 2017;52(5):1729-48.
146. Boyd M, Broad JB, Kerse N, et al. Twenty-year trends in dependency in residential aged care in Auckland, New Zealand: a descriptive study. *J Am Med Dir Assoc*. 2011;12(7):535-40.
147. Cohen JW, Dubay LC. The effects of Medicaid reimbursement method and ownership on nursing home costs, casemix, and staffing. *Inquiry*. 1990;27(2):183-200.
148. Collins TL. The therapy threshold within the Medicare prospective payment system: associated ethical dilemmas and influence of therapy practice patterns and quality of patient care. *Home Healthc Nurse*. 2006;24(9):581-9.
149. Davis MA, Freeman JW, Kirby EC. Nursing home performance under case-mix reimbursement: responding to heavy-care incentives and market changes. *Health Serv Res*. 1998;33(4 Pt 1):815-34.
150. Dubuc N, Dubois MF, Raîche M, et al. Meeting the home-care needs of disabled older persons living in the community: does integrated services delivery make a difference? *BMC Geriatr*. 2011;11:67.
151. Duell D, Koolman X, Portrait F. Practice variation in the Dutch long-term care and the role of supply-sensitive care: Is access to the Dutch long-term care equitable? *Health Econ*. 2017;26(12):1728-42.
152. Feng Z, Grabowski DC, Intrator O, et al. The effect of state Medicaid case mix payment on nursing home resident acuity. *Health Serv Res*. 2006;41(4 Pt 1):1317-36.
153. United States General Accounting Office (GAO). Nursing homes: admission problems for Medicaid recipients and attempts to solve them. Pub. no. HRD-90-135. 1990. Available from: https://www.gao.gov/products/HRD-90-135
154. U. S. Government Accountability Office (GAO). Skilled nursing facilities: Providers have responded to Medicare payment system by changing practices. GAO–02–841. 2002 2002. Available from: https://www.gao.gov/products/GAO-02-841
155. Gargett S. Public policy and the dependency of nursing home residents in Australia: 1968–69 to 2006–07. *Health Policy*. 2010;96(2):143-53.
156. Grabowski DC. The economic implications of case-mix Medicaid reimbursement for nursing home care. *Inquiry*. 2002;39(3):258-78.
157. Grabowski DC, Angelelli JJ, Mor V. Medicaid payment and risk-adjusted nursing home quality measures. *Health Aff (Millwood)*. 2004;23:243-52.
158. Hébert R, Dubois MF, Raîche M, et al. The effectiveness of the PRISMA integrated service delivery network: Preliminary report on methods and baseline data. *Int J Integr Care*. 2008;8:1-15.
159. Hébert R, Raîche M, Dubois M-F, et al. Impact of PRISMA, a coordination-type integrated service delivery system for frail older people in Quebec (Canada): A quasi-experimental study. *J Gerontol B Psychol Sci Soc Sci*. 2010;65B(1):107-18.
160. Hollander MJ, Chappell NL. A comparative analysis of costs to government for home care and long-term residential care services, standardized for client care needs. *Can J Aging*. 2007;26:149-61.
161. Kenney GM, Holahan J. The nursing home market and hospital discharge delays. *Inquiry*. 1990;27(1):73-85.
162. Konetzka RT, Norton EC, Sloane PD, et al. Medicare prospective payment and quality of care for long stay nursing facility residents. *Med Care*. 2006;44(3):270-76.

163. Latham NK, Jette AM, Ngo LH, et al. Did the 1997 Balanced Budget Act reduce use of physical and occupational therapy services? *Arch Phys Med Rehabil*. 2008;89(5):807-14.
164. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2001. Available from: www.medpac.gov/docs/default-source/reports/Mar01_Entire_report.pdf?sfvrsn=0
165. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2002. Available from: www.medpac.gov/docs/default-source/reports/Mar02_Entire_report.pdf?sfvrsn=0
166. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2001 2003. Available from: www.medpac.gov/docs/default-source/reports/Mar03_Entire_report.pdf?sfvrsn=0
167. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2004 2004. Available from: http://www.medpac.gov/docs/default-source/reports/Mar04_Entire_reportv3.pdf?sfvrsn=0
168. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2005. Available from: http://www.medpac.gov/docs/default-source/reports/Mar05_EntireReport.pdf?sfvrsn=0
169. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2005 2006. Available from: http://www.medpac.gov/docs/default-source/reports/Mar06_EntireReport.pdf?sfvrsn=0
170. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2007. Available from: http://www.medpac.gov/docs/default-source/reports/Mar07_EntireReport.pdf?sfvrsn=0
171. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2008. Available from: http://www.medpac.gov/docs/default-source/reports/Mar08_EntireReport.pdf?sfvrsn=0
172. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2009 2009. Available from: http://www.medpac.gov/docs/default-source/reports/march-2009-report-to-congress-medicare-payment-policy.pdf?sfvrsn=0
173. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2010 2010. Available from: http://www.medpac.gov/docs/default-source/reports/Mar10_EntireReport.pdf?sfvrsn=0
174. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2011 2011. Available from: http://www.medpac.gov/docs/default-source/reports/Mar11_EntireReport.pdf?sfvrsn=0
175. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2012. Available from: http://www.medpac.gov/docs/default-source/reports/march-2012-report-to-the-congress-medicare-payment-policy.pdf?sfvrsn=0
176. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2013. Available from: http://www.medpac.gov/docs/default-source/reports/mar13_entirereport.pdf?sfvrsn=0
177. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2014. Available from: http://www.medpac.gov/docs/default-source/reports/mar14_entirereport.pdf?sfvrsn=0
178. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2015. Available from: www.medpac.gov/docs/default-source/reports/mar2015_entirereport_revised.pdf?sfvrsn=0

179. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2016. Available from: www.medpac.gov/docs/default-source/reports/march-2016-report-to-the-congress-medicare-payment-policy.pdf?sfvrsn=0
180. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2017. Available from: http://www.medpac.gov/docs/default-source/reports/mar17_entirereport224610adfa9c665e80adff00009edf9c.pdf?sfvrsn=0
181. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2018. Available from: www.medpac.gov/docs/default-source/reports/mar18_medpac_entirereport_sec_rev_0518.pdf?sfvrsn=0
182. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2019. Available from: http://www.medpac.gov/docs/default-source/reports/mar19_medpac_entirereport_sec_rev.pdf?sfvrsn=0
183. Mor V, Gruneir A, Feng Z, et al. The effect of state policies on nursing home resident outcomes. *J Am Geriatr Soc*. 2011;59(1):3-9.
184. Nyman JS, Connor RA. Do case-mix adjusted nursing home reimbursements actually reflect costs? Minnesota's experience. *J Health Econ*. 1994;13(2):145-62.
185. Office of Inspector General, Department of Health and Human Services. Review of Medicare home health services in California, Illinois, New York, and Texas. A–04–99–01994. 1997. Available from: https://oig.hhs.gov/oas/reports/region4/49901194.pdf
186. Office of Inspector General, Department of Health and Human Services. The Medicare payment system for skilled nursing facilities needs to be reevaluated. Report no. OEI–02–13–00610. 2015. Available from: https://oig.hhs.gov/oei/reports/oei-02-13-00610.pdf
187. Schlenker RE. Nursing home costs, Medicaid rates, and profits under alternative Medicaid payment systems. *Health Serv Res*. 1991;26(5):623-49.
188. Schultz BM, Ward D, Knickman JR. RUG-II impacts on long-term care facilities in New York. *Health Care Financ Rev*. 1994;16(2):85-99.
189. Swan JH, Harrington C, Grant L, et al. Trends in Medicaid nursing home reimbursement: 1978-89. *Health Care Financ Rev*. 1993;14(4):111-32.
190. Tenand M, Bakx P, van Doorslaer E. Equal long-term care for equal needs with universal and comprehensive coverage? An assessment using Dutch administrative data. *Health Econ*. 2020;29(4):435-51.
191. Tenand M, Bakx P, van Doorslaer E. Eligibility or use? Disentangling the sources of horizontal inequity in home care receipt in the Netherlands. *Health Econ*. 2020;29(10):1161-79.
192. Teno JM, Feng Z, Mitchell SL, et al. Do financial incentives of introducing case mix reimbursement increase feeding tube use in nursing home residents? *J Am Geriatr Soc*. 2008;56(5):887-90.
193. Thorpe KE, Gertler PJ, Goldman P. The Resource Utilization Group system: its effect on nursing home case mix and costs. *Inquiry*. 1991;28(1):357-65.
194. Unruh L, Zhang NJ, Wan TTH. The impact of Medicare reimbursement changes on staffing and the quality of care in nursing homes. *Int J Public Pol*. 2006;1(4):421-34.
195. Warren S, Sampson M. ASHA members report their PDPM experiences. *ASHA Leader*. 2020;25(3):40-42.
196. White C. Rehabilitation therapy in skilled nursing facilities: Effects of Medicare's new prospective payment system. *Health Aff (Millwood)*. 2003;22(3):214-23.
197. White CF. Medicare's Prospective Payment System for skilled nursing facilities: Effects on staffing and quality of care. *Inquiry*. 2005;42(4):351-63.

198. White A, Goldberg H, Deitz D, et al. Analysis of 2006-2007 home health case-mix change 2009. Available from: https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HomeHealthPPS/Downloads/Home_Health_Case_Mix_Changes_2006-07.pdf
199. Wodchis WP. Physical rehabilitation following Medicare prospective payment for skilled nursing facilities. *Health Serv Res*. 2004;39:1299-318.
200. Wodchis WP, Hirth RA, Fries BE. Effect of Medicaid payment on rehabilitation care for nursing home residents. *Health Care Financ Rev*. 2007;28(3):117-29.
201. Medicare Payment Advisory Commission (MedPAC). Report to the Congress: Medicare payment policy. 2000. Available from: http://www.medpac.gov/docs/default-source/reports/Mar00_Entire_report.pdf?sfvrsn=0
202. Hollander MJ, Pallan P. The British Columbia Continuing Care system: service delivery and resource planning. *Aging (Milano)*. 1995;7(2):94-109.
203. Hébert R, Veil A. Monitoring the degree of implementation of an integrated delivery system. *Int J Integr Care*. 2004;4:e05.
204. MacAdam M. PRISMA: Program of Research to Integrate the Services for the Maintenance of Autonomy. A system-level integration model in Quebec. *Int J Integr Care*. 2015;15(6).
205. Schünemann HJ, Higgins JPT, Vist GE, et al. Chapter 14: Completing 'Summary of findings' tables and grading the certainty of the evidence. Cochrane Handbook for Systematic Reviews of Interventions Version 6.1 (updated September 2020): Cochrane, 2020.

Appendix A Literature search strategies

A. List of resources used in the literature search

	Databases and information resources	Search dates	Results	Included papers
1.	Ovid Medline	19 Aug 2020	1875	
2.	Ovid Social Policy and Practice	20 Aug 2020	101	
3.	EBSCO SocIndex with Full Text	19 Aug 2020	96	
4.	EBSCO CINAHL Complete	20 Aug 2020	427	
5.	John Wiley & Sons Inc. Cochrane Library	21 Aug 2020	172	
6.	Core.ac.uk	24 Aug 2020	439	
7.	Google Scholar: home	25 Aug 2020	1200	
8.	Google Scholar residential	25 Aug 2020	1200	
9.	Google 1st 50 results	26 Aug 2020	50	
10.	Van der Bulck 2020 (core review) references	27 Aug 2020	69	
Total database results			5629	
Deduplicated database results			4224	22
Supplemental searches				
Citation and reference chasing results		12-17 Nov 2020	2381	
Deduplicated citation and reference chasing results			1201	32
Website searches and final brief searches (Ovid Medline, Repec, Google Scholar)		25 Nov 2020		11
Final included results				65

B. Database search strategies

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) 1946 to August 17, 2020 Platform: Ovid Search date: 19 Aug 2020			
Theme	Search number	Search terms	Results
Case-mix terms	1	(casemix or case-mix or "case mix").ab,ti,kw,kf.	6368
	2	(Resource* Utili#ation Group* or Resource Utili#ation Band* or "RUG-III" or "RUGS III" or "RUG-III/HC" or "RUG-IV" or "RUG–HHC-alt" or "RUG-CA" or RUG-I or "RUG I" or RUG-II or "RUG II" or "RUG T-18" or "RUG ADLs" or "53-RUGs" or "RUG-T18").ti,ab,kw,kf.	161
	3	("Home and Community Care model" or Adjusted Clinical Group* or Personal Care Services Case-Mix Model* or "Degrees of Need" or "Home and Community Support Services Case-Mix Model" or Home Health Resource Group* or Patient Driven Payment Model* or "Patient-driven payment model*" or PDPM or AN-ACC or "aged care classification" or "AN-SNAP").ti,ab,kw,kf.	550
	4	exp Diagnosis-related groups/ or (diagnostic related group* or diagnosis related group* or diagnosis-related group* or diagnostic-related group*	12802

		or "DRG-based" or DRG-focused or G-DRG or G-DRG-System or MS-DRG or EuroDRG).ab,ti,kw.	
	5	("function-related group*" or "population grouping methodology" or "functional independence measure-function-related group*" or FIM-FRG).ab,ti.	37
	6	(careband* or care-band* or care band*).mp.	16
	7	((care or health or service or resourc* or dependen* or cost or disabil* or eligibil* or capitat* or fund*) adj (band or bands or banding or threshold or thresholds)).ti.	128
	8	(interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool").ti,ab,kw,kf.	708
	9	*Prospective payment system/ or ("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) adj2 PPS)).ab,ti.	4901
	10	or/1-9	21628
Home care setting	11	exp Home care services/ or House Calls/ or Community Health Services/ or Adult Day Care Centers/ or exp Community Health Nursing/ or Senior Centers/	94791
	12	(home support or home-support or home care or home-care or homecare or home-based care or home nursing or domicil* care or home visit* or house visit* or domicil* visit* or home help* or home-help* or home health or home-health).ti,ab,kw.	35856
	13	((home or home-based or house or houses or house-based or domicil* or residence or residential) adj2 (service* or visit* or call* or support* or care)).ti,ab,kw.	45442
	14	((healthcare or "health care" or care or service or services or support or supports) adj (home-based or home setting or home settings or community setting or community settings or community-based or community dwelling or community dwellings or community-dwelling or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")).ti,ab,kw.	7188
	15	(home or domicil* or house).ti.	83877
	16	("delivered in the home" or "delivered at home").mp.	498
	17	or/11-16	177544
Residential care setting	18	exp Residential facilities/ or exp Nursing homes/ or Long-Term care/ or Hospices/ or Hospice care/ or "Hospice and palliative care nursing"/ or Terminal care/ or institutionalization/	112100
	19	((residential or nursing or old people* or elder* or geriatric or assisted living) adj2 (home* or facilit*)).ti,ab,kw.	41584
	20	((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) adj (care or nursing or support)).ti,ab,kw.	38177
	21	(LTCF or LTC or long-term care or long term care or longterm care or long-term stay* or long term stay* or long-stay* or long-term facilit* or extended care or Langzeitpflege or "etablissements de soins de longue" or langdurige zorg).ti,ab,kw.	27398
	22	(hospice* or care home* or "homes for the aged" or geriatric residen* or institutionali* or skilled nursing facilit* or RACF).ab,ti,kw,kf.	35807
	23	or/18-22	167213
Home or residential care setting	24	17 or 23	307737
Casemix AND home or residential care setting	25	10 and 24	2866

Selected 6 countries (Australia, Canada, Germany, Netherlands, New Zealand and United States)	26	exp Australia/ or (Australi* or Australian Capital Territory or "New South Wales" or Northern Territory or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or Torres Island* or "Canton and Enderbury Islands" or Christmas Island or Aborigin*).ti,ab,kw,kf,hw.	224527
	27	(Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia*" or Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick*" or Fredericton* or Moncton* or Newfoundland* or "New Foundland*" or Labrador* or "St John*" or "Saint John*" or "Northwest Territor*" or Yellowknife* or "Nova Scotia*" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island*" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*).ti,ab,kw,kf,hw. or exp Canada/	302965
	28	exp Germany/ or (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung).ti,ab,kw,kf,hw.	258691
	29	Netherlands/ or Caribbean Netherlands/ or (Netherlands or Nederland* or Holland or Dutch or Low Countries or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or North Brabant or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or 's-Hertogenbosch or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or Sint Eustatius or Saba or Algemene Wet Bijzondere Ziektekosten or Zorgverzekeringswet or Zorginstituut).ti,ab,kf,kw,hw.	117815
	30	exp New Zealand/ or (New Zealand or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or Stewart Island or Campbell Islands or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or Ross Dependency or Tokelau or Otagu or Canterbury or Dunedin or Tauranga).ti,ab,kw,kf,hw.	74001
	31	exp United States/ or (United States or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or New Hampshire* or New Jersey* or New Mexico* or New York* or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or Rhode Island* or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* or West Virginia* or Wisconsin* or Wyoming* or American Samoa* or Guam or Puerto Ric* or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" or "Department of Health and Human Services" or HHS or Medicare or Medicaid).ti,ab,kw,kf,hw.	2046783
	32	or/26-31	2873441
Case-mix AND (home or residential care	33	25 and 32	2237

setting) AND (selected countries)			
Date limit	34	limit 33 to yr="1990 -Current"	1875

Ovid Social Policy and Practice
[Database Field Guide] Social Policy and Practice 202007
Search date: 20 Aug 2020
Platform: EBSCO
Years of Coverage: 1890s to Present

Theme	Search number	Search terms	Results
Case-mix	1	(casemix or case-mix or "case mix").mp.	93
	2	(Resource* Utili#ation Group* or Resource Utilization Band* or "RUG-III" or "RUGS III" or "RUG-III/HC" or "RUG-IV" or "RUG–HHC-alt" or "RUG-CA" or RUG-I or "RUG I" or RUG-II or "RUG II" or "RUG T-18" or "RUG ADLs" or "53-RUGs" or "RUG-T18").mp.	14
	3	("Home and Community Care model" or Adjusted Clinical Group* or Personal Care Services Case-Mix Model* or "Degrees of Need" or "Home and Community Support Services Case-Mix Model" or Home Health Resource Group* or Patient Driven Payment Model* or "Patient-driven payment model*" or PDPM or AN-ACC or "aged care classification" or "AN-SNAP").mp.	7
	4	(diagnostic related group* or diagnosis related group* or diagnosis-related group* or diagnostic-related group* or "DRG-based" or DRG-focused or G-DRG or G-DRG-System or MS-DRG or EuroDRG).mp.	4
	5	("function-related group*" or "population grouping methodology" or "functional independence measure-function-related group*" or FIM-FRG).mp.	0
	6	(careband* or care-band* or care band*).mp.	0
	7	((care or health or service or resourc* or dependen* or cost or disabil* or eligibil* or capitat* or fund*) adj (band or bands or banding or threshold or thresholds)).mp.	52
	8	(interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool").mp.	116
	9	("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) adj2 PPS)).mp.	11
	10	or/1-9	277
Home setting	11	(home support or home-support or home care or home-care or homecare or home-based care or home nursing or domicil* care or home visit* or house visit* or domicil* visit* or home help* or home-help* or home health or home-health).mp.	8082
	12	((home or home-based or house or houses or house-based or domicil* or residence or residential) adj2 (service* or visit* or call* or support* or care)).mp.	22273
	13	((healthcare or "health care" or care or service or services or support or supports) adj (home-based or home setting or home settings or community setting or community settings or community-based or community dwelling or community dwellings or community-dwelling or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")).mp.	2244
	14	(home or domicil* or house).mp.	37441
	15	("delivered in the home" or "delivered at home").mp.	20
	16	or/11-15	46463

Residential setting	17	((residential or nursing or old people* or elder* or geriatric or assisted living) adj2 (home* or facilit*)).mp.	10287
	18	((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) adj (care or nursing or support)).mp.	17590
	19	(LTCF or LTC or long-term care or long term care or longterm care or long-term stay* or long term stay* or long-stay* or long-term facilit* or extended care or Langzeitpflege or "etablissements de soins de longue" or langdurige zorg).mp.	5914
	20	(hospice* or care home* or "homes for the aged" or geriatric residen* or institutionali* or skilled nursing facilit* or RACF).mp.	12718
	21	or/17-20	28783
Home or residential setting	22	16 or 21	57224
Case-mix AND (home or residential care setting)	23	10 and 22	166
Selected 6 countries (Australia, Canada, Germany, Netherlands, New Zealand and United States)	24	(Australi* or Australian Capital Territory or "New South Wales" or Northern Territory or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or Torres Island* or "Canton and Enderbury Islands" or Christmas Island or Aborigin*).mp.	7302
	25	(Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia*" or Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick*" or Fredericton* or Moncton* or Newfoundland* or "New Foundland*" or Labrador* or "St John*" or "Saint John*" or "Northwest Territor*" or Yellowknife* or "Nova Scotia*" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island*" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*).mp.	7181
	26	(German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung).mp.	3294
	27	(Netherlands or Nederland* or Holland or Dutch or Low Countries or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or North Brabant or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or 's-Hertogenbosch or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or Sint Eustatius or Saba or Algemene Wet Bijzondere Ziektekosten or Zorgverzekeringswet or Zorginstituut).mp.	4098
	28	(New Zealand or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or Stewart Island or Campbell Islands or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or Ross Dependency or Tokelau or Otagu or Canterbury or Dunedin or Tauranga).mp.	1745
	29	(United States or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or New Hampshire* or New Jersey* or New Mexico* or New York* or North Carolina* or North	30350

		Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or Rhode Island* or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* or West Virginia* or Wisconsin* or Wyoming* or American Samoa* or Guam or Puerto Ric* or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" or "Department of Health and Human Services" or HHS or Medicare or Medicaid).mp.	
	30	or/24-29	48176
Case-mix AND (home or residential care setting) AND (any of the selected countries)	31	23 and 30	**101**
		Note: a date limit was not used for this search as the results numbers were small with the vast majority of the results falling within the required date range	

Database EBSCO Socindex with Full Text **Platform: EBSCO** **Search date: 19 Aug 2020**			
Theme	Search number	Search terms	Results
Casemix	S1	TI (casemix OR case-mix OR "case mix") OR AB (casemix OR case-mix OR "case mix") OR SU (casemix OR case-mix OR "case mix") OR KW (casemix OR case-mix OR "case mix")	281
	S2	TI ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG−HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR AB ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG−HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR KW ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG−HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR SU ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG−HHC-alt" OR "RUG-CA"	23

	or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG ADLs" OR "53-RUGs" OR "RUG T-18" OR "RUG-T18")	
S3	TI ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM or "aged care classification") OR AB ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification") OR KW ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification") OR SU ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification")	13
S4	TI ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR AB ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR KW ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR SU ("diagnostic related group" or "diagnostic	260

		related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG)	
	S5	TI ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR AB ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR SU ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR KW ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG)	2
	S6	TX (careband OR carebands OR carebanding OR care-band OR care-bands OR care-banding OR "care band" OR "care banding" OR "care bands")	0
	S7	TI ((care OR health OR service or resourc* OR dependen* OR cost OR disabil* OR eligibil* OR capitat* OR fund*) W1 (band OR bands OR banding OR threshold OR thresholds)) OR AB ((care OR health OR service or resourc* OR dependen* OR cost OR disabil* OR eligibil* OR capitat* OR fund*) W1 (band OR bands OR banding OR threshold OR thresholds))	66
	S8	TI (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR AB (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR SU (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR KW (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool")	84
	S9	TI ("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) W2 PPS)) OR AB ("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) W2 PPS))	201
	S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	828
Home care	S11	DE "HOME care services" OR DE "HOME care of older people" OR DE "COMMUNITY health services" OR DE "COMMUNITY health services for older people" OR DE "UTILIZATION of community health services" OR DE "DAY care centers for people with mental disabilities" OR DE "DAY care centers for people with disabilities" OR DE "SENIOR citizen's clubs"	6274
	S12	TI ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR AB ("home support" OR "home supports" OR "home-support" or	11801

	"home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR SU ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR KW ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health")	
S13	TI ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR AB ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR SU ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR KW ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care))	17834
S14	TI ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR AB ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR SU ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR KW ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the	11174

		place of residence" or "at the places of residence" or "at the home" or "at the homes"))	
	S15	TI (home OR domicil* OR house)	24758
	S16	TX ("delivered in the home" OR "delivered at home")	488
	S17	S11 OR S12 OR S13 OR S14 OR S15 OR S16	49892
Residential care	S18	(DE "GROUP homes" OR DE "INSTITUTIONAL care of older people") OR (DE "INSTITUTIONAL care" OR DE "INSTITUTIONALIZED persons") OR (DE "NURSING care facilities") OR (DE "LONG-term care facilities" OR DE "LONG-term care of older people") OR (DE "HOSPICES (Terminal care facilities)") OR (DE "HOSPICE care")	7142
	S19	TI ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR AB ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR SU ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR KW ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*))	10344
	S20	TI ((residential OR institution* OR "long-term" OR "long term" OR extended OR geriatric OR aged OR elder* OR "old age" OR dementia) W2 (care OR nursing OR support)) OR AB ((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) W2 (care or nursing or support)) OR SU ((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) W2 (care or nursing or support)) OR KW ((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) W2 (care or nursing or support))	21215
	S21	TI (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR AB (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR SU (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR KW (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg")	6239
	S22	TI (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric	22633

		residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR AB (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR SU (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR KW (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF)	
	S23	S18 OR S19 OR S20 OR S21 OR S22	47547
Home care and Residential care	S24	S17 AND S23	12863
Casemix and home/residential care	S25	S10 AND S24	142
AUS/CAN/ GER/NET/ NZ/USA	S26	TI (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR AB (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR SU (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory " or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR KW (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory " or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*)	52807
	S27	TI (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR AB (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British	72594

		Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR SU (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR KW (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*)	
	S28	TI (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR AB (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or	72807

		Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR SU (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR KW (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung)	
	S29	TI (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR AB (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR SU (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR KW (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or	21158

		Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut)	
	S30	TI ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR AB ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR SU ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR KW ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga)	10729
	S31	TI ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR AB ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR	739650

		"New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR SU ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New Hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR KW ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid)	
	S32	S26 OR S27 OR S28 OR S29 OR S30 OR S31	918593

	S33	S25 AND S32	103
Date Limit	S34	Limit 1990-2020	**97**
		1 record 'does not exist' (error message by database)	**96**

EBSCO CINAHL Complete
Platform: EBSCO
Search Date: 20 Aug 2020

Search number	Search terms	Results
S1	(MH "Case Mix") OR TI (casemix OR case-mix OR "case mix") OR AB (casemix OR case-mix OR "case mix") OR SU (casemix OR case-mix OR "case mix") OR KW (casemix OR case-mix OR "case mix")	3525
S2	(MH "Resource Utilization Group") OR TI ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG–HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR AB ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG–HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR KW ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG–HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18") OR SU ("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG–HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG ADLs" OR "53-RUGs" OR "RUG-T18")	218
S3	TI ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM or "aged care classification") OR AB ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification") OR KW ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health 3Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification") OR SU ("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models"	188

	OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM OR "aged care classification")	
S4	(MH "Diagnosis-Related Groups") OR TI ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR AB ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR KW ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG) OR SU ("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG)	4183
S5	TI ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR AB ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR SU ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG) OR KW ("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG)	36
S6	TX (careband OR carebands OR carebanding OR care-band OR care-bands OR care-banding OR "care band" OR "care banding" OR "care bands")	11
S7	TI ((care OR health OR service or resourc* OR dependen* OR cost OR disabil* OR eligibil* OR capitat* OR fund*) W1 (band OR bands OR banding OR threshold OR thresholds)) OR AB ((care OR health OR service or resourc* OR dependen* OR cost OR disabil* OR eligibil* OR capitat* OR fund*) W1 (band OR bands OR banding OR threshold OR thresholds))	617
S8	TI (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR AB (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR SU (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool") OR KW (interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool")	542
S9	(MM "Prospective Payment System") OR TI ("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) W2 PPS)) OR AB ("prospective payment" or "HH PPS" or "LTCH PPS" or ((Medicaid or Medicare) W2 PPS))	2674
S10	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9	10673
S11	(MH "Home Health Care+") OR (MH "Home Health Aides") OR (MH "Home Nursing") OR (MH "Community Health Centers") OR (MH "Community Health Workers") OR (MH "Community Health Services") OR (MH "Community Health Nursing") OR (MH "Community Mental Health Nursing") OR (MH "Community Mental Health Services")	118275
S12	TI ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR AB ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home	58621

	help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR SU ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health") OR KW ("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health")	
S13	TI ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR AB ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR SU ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care)) OR KW ((home or home-based or house or houses or house-based or domicil* or residence or residential) W2 (service* or visit* or call* or support* or care))	63225
S14	TI ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR AB ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR SU ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes")) OR KW ((healthcare or "health care" or care or service or services or support or supports) W2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes"))	26881
S15	TI (home OR domicil* OR house)	63284
S16	TX ("delivered in the home" OR "delivered at home")	1584
S17	S11 OR S12 OR S13 OR S14 OR S15 OR S16	196726
S18	(MH "Institutionalization") OR (MH "Nursing Home Patients") OR (MH "Nursing Homes+") OR (MH "Nursing Home Personnel") OR (MH "Residential Facilities") OR (MH "Hospice and Palliative Nursing") OR (MH "Hospice Patients") OR (MH "Hospice Care") OR (MH "Hospices") OR (MH "Long Term Care") OR (MH "Residential Care")	82939
S19	TI ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR AB ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR SU ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*)) OR KW ((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) W2 (home* or facilit*))	56197
S20	TI ((residential OR institution* OR "long-term" OR "long term" OR extended OR geriatric OR aged OR elder* OR "old age" OR dementia) W2 (care OR nursing OR support)) OR AB ((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) W2 (care or nursing or support)) OR SU ((residential or institution* or "long-term" or "long term" or extended or geriatric or	64198

	aged or elder* or "old age" or dementia) W2 (care or nursing or support)) OR KW ((residential or institution* or "long-term" or "long term" or extended or geriatric or aged or elder* or "old age" or dementia) W2 (care or nursing or support))	
S21	TI (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR AB (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR SU (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg") OR KW (LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg")	37075
S22	TI (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR AB (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR SU (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF) OR KW (hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF)	39593
S23	S18 OR S19 OR S20 OR S21 OR S22	126774
S24	S17 AND S23	37234
S25	S10 AND S24	603
S26	(MH "Australia+") OR TI (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR AB (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR SU (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*) OR KW (Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*)	152055
S27	(MH "Canada+") OR TI (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq*	168166

	or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR AB (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR SU (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*) OR KW (Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*)	
S28	(MH "Germany+") OR TI (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR AB (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR SU (German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung) OR KW(German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung)	46767
S29	(MH "Netherlands") OR (MH "Netherlands Antilles") OR TI (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or	43491

	Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR AB (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR SU (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut) OR KW (Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut)	
S30	(MH "New Zealand") OR TI ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR AB ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR SU ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga) OR KW ("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga)	41653
S31	(MH "United States+") OR (MH "United States Centers for Medicare and Medicaid Services") OR (MH "United States Department of Health and Human Services") OR (MH "United States Public Health Service") OR (MH "Medicare") OR (MH "Medicaid") OR (MH "Native Americans") OR TI ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR AB ("United States" or USA or "U. S." or America* or Alabama* or	1110902

	Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR SU ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New Hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid) OR KW ("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or "New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid)	
S32	S26 OR S27 OR S28 OR S29 OR S30 OR S31	1493412
S33	S25 AND S32	442
S34	Limit to 1990-2020	427

Database: Cochrane Library **Platform: John Wiley & Sons** **Search date: 21 Aug 2020**		
Search number	Search terms	Results
#1	((casemix or case-mix or "case mix"))	352

#2	("Resource Utilization Group" OR "Resource Utilisation Group" OR "Resource Utilization Groups" OR "Resource Utilisation Groups" OR "Resource Utilization Band" OR "Resource Utilisation Band" OR "Resource Utilization Bands" OR "Resource Utilisation Bands" OR "RUG-III" OR "RUGS III" OR "RUG-III/HC" OR "RUG-IV" OR "RUG−HHC-alt" OR "RUG-CA" or RUG-I OR "RUG I" OR RUG-II OR "RUG II" OR "RUG T-18" OR "RUG-T18" OR "RUG ADLs" OR "53-RUGs")	3
#3	(("Home and Community Care model" or "Adjusted Clinical Group" OR "Adjusted Clinical Groups" OR "Personal Care Services Case-Mix Model" OR "Personal Care Services Case-Mix Models" OR "Degrees of Need" OR "Home and Community Support Services Case-Mix Model" OR "Home and Community Support Services Case-Mix Models" OR "Home Health Resource Group" OR "Home Health Resource Groups" OR "Patient Driven Payment Model" OR "Patient Driven Payment Models" OR "Patient-driven payment model" OR "Patient-driven payment models" OR PDPM or "aged care classification"))	8
#4	MeSH descriptor: [Diagnosis-Related Groups] explode all trees	60
#5	("diagnostic related group" or "diagnostic related groups" or "diagnosis related group" OR "diagnosis related groups" or "diagnosis-related group" or "diagnosis-related groups" or "diagnostic-related group" or "diagnostic-related groups" or "DRG-based" or "DRG-focused" or "G-DRG" or "G-DRG-System" or "MS-DRG" or EuroDRG)	318
#6	("function-related group" OR "function-related groups" OR "population grouping methodology" OR "functional independence measure-function-related group" OR "functional independence measure-function-related group" OR FIM-FRG)	0
#7	(careband OR carebands OR carebanding OR care-band OR care-bands OR care-banding OR "care band" OR "care bands" OR "care banding") 3	3
#8	((care or health or service or resourc* or dependen* or cost or disabil* or eligibil* or capitat* or fund*) NEAR/1 (band or bands or banding or threshold or thresholds))	91
#9	(interRAI or interRAI-HC or RAI-HC or NEDRAI or "resident assessment instrument" or "single assessment tool")	61
#10	MeSH descriptor: [Prospective Payment System] explode all trees	64
#11	((Medicaid or Medicare) Near/2 PPS)	4
#12	("prospective payment" or "HH PPS" or "LTCH PPS")	97
#13	#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12	890
#14	MeSH descriptor: [Home Care Services] explode all trees	2398
#15	MeSH descriptor: [House Calls] explode all trees	517
#16	MeSH descriptor: [Community Health Services] explode all trees	13590
#17	MeSH descriptor: [Adult Day Care Centers] explode all trees	12
#18	MeSH descriptor: [Community Health Nursing] explode all trees	345
#19	MeSH descriptor: [Senior Centers] explode all trees	7
#20	#14 OR #15 OR #16 OR #17 OR #18 OR #19	13864
#21	("home support" OR "home supports" OR "home-support" or "home care" or "home-care" or homecare or "home-based care" or "home nursing" or "domiciliary care" or "home visit" OR "home visits" OR "house visit" OR "house visits" or "domiciliary visit" OR "domiciliary visits" or "home help" OR "home helps" or "home-help" OR "home-helps" or "home health" or "home-health")	9127
#22	((home or home-based or house or houses or house-based or domicil* or residence or residential) NEAR/2 (service* or visit* or call* or support* or care))	11757
#23	((healthcare or "health care" or care or service or services or support or supports) NEAR/2 (home-based or "home setting" or "home settings" or "community setting" or "community settings" or "community-based" or "community dwelling" or "community dwellings" or "community-dwelling" or "in the community" or "in the home" or "in the homes" or "at the place of residence" or "at the places of residence" or "at the home" or "at the homes"))	2505
#24	((home OR domicil* OR house)):ti,ab,kw	45725
#25	("delivered in the home" OR "delivered at home")	225
#26	#20 OR #21 OR #22 OR #23 OR #24 OR #25	57763
#27	MeSH descriptor: [Residential Facilities] explode all trees	1735
#28	MeSH descriptor: [Nursing Homes] explode all trees	1334
#29	MeSH descriptor: [Long-Term Care] explode all trees	1120
#30	MeSH descriptor: [Hospices] explode all trees	30
#31	MeSH descriptor: [Hospice Care] explode all trees	97
#32	MeSH descriptor: [Hospice and Palliative Care Nursing] explode all trees	17
#33	MeSH descriptor: [Terminal Care] explode all trees	442
#34	MeSH descriptor: [Institutionalization] explode all trees	200

#35	#27 OR #28 OR #29 OR #30 OR #31 OR #32 OR #33 OR #34	3297
#36	((residential OR nursing OR "old people" OR "old people's" OR "older people" OR "older people's" OR elder* or geriatric or assisted living) NEAR/2 (home* or facilit*))	7078
#37	((residential OR institution* OR "long-term" OR "long term" OR extended OR geriatric OR aged OR elder* OR "old age" OR dementia) NEAR/2 (care OR nursing OR support))	14485
#38	(LTCF or LTC OR "long-term care" or "long term care" or "longterm care" or "long-term stay" OR "long-term stays" OR "long term stay" OR "long term stays" OR "long-stay" OR "long-stays" OR "long-staying" or "long-term facility" OR "long-term facilities" or "extended care" or Langzeitpflege or "etablissements de soins de longue" or "langdurige zorg")	7654
#39	(hospice OR hospices or "care home" OR "care homes" or "homes for the aged" or "geriatric residence" OR "geriatric residences" OR "geriatric resident" or institutionali* or "skilled nursing facility" OR "skilled nursing facilities" or RACF)	4892
#40	#35 OR #36 OR #37 OR #38 OR #39	22212
#41	#26 OR #40	71764
#42	#13 AND #41	207
#43	MeSH descriptor: [Australia] explode all trees	4105
#44	(Australi* or "Australian Capital Territory" or "New South Wales" or "Northern Territory" or Queensland* or Tasmania* or Victoria or Canberra or Sydney or Darwin or Brisbane or Adelaide or Hobart or Melbourne or Perth or "Torres Island" OR "Torres islander" OR "Torres islanders" or "Canton and Enderbury Islands" or "Christmas Island" or Aborigin*)	45376
#45	MeSH descriptor: [Canada] explode all trees	3470
#46	(Canada* or Canadi* or Alberta* or Calgary* or Edmonton* or "British Columbia" OR "British Colombian" OR Vancouver* or Victoria* or Manitoba* or Winnipeg* or "New Brunswick" or Fredericton* or Moncton* or Newfoundland* or "New Foundland" or Labrador* or "St John" or "Saint John" or "Northwest Territory" or Yellowknife* or "Nova Scotia" OR "Nova Scotian" or Halifax* or Dalhousie* or Nunavut* or Igaluit* or Ontario* or Ontarian* or Toronto* or Ottawa* or Hamilton or Queen's or McMaster* or Kingston* or Sudbury* or "Prince Edward Island" OR "Prince Edward islander" OR "Prince Edward Islanders" or Charlottetown* or Quebec* or Montreal* or McGill* or Laval* or Sherbrooke* or Nunavik* or Kuujjuaq* or Inukjuak* or Puvirnituq* or Saskatchewan* or Saskatoon* or Yukon* or Whitehorse*)	80945
#47	MeSH descriptor: [Germany] explode all trees	2953
#48	(German* or Deutschland or Frankfurt or Ruhr or Bundestag or Bundesrat or "Baden-Württemberg" or Bavaria or Berlin or Brandenburg or Bremen or Hamburg or Hesse or "Mecklenburg-Vorpommern" or Lower Saxony or North Rhine-Westphalia or Rhineland-Palatinate or Saarland or Saxony or "Saxony-Anhalt" or "Schleswig-Holstein" or Thuringia or Stuttgart or Munich or Berlin or Potsdam or Bremen or Hamburg or Wiesbaden or Schwerin or Hanover or "Düsseldorf" or Mainz or "Saarbrücken" or Dresden or Magdeburg or Kiel or Erfurt or Gesetzliche Krankenversicherung or Private Krankenversicherung or Pflegepflichtversicherung)	64505
#49	MeSH descriptor: [Netherlands] explode all trees	3418
#50	(Netherlands or Nederland* or Holland or Dutch or "Low Countries" or Drenthe or Flevoland or Friesland or Gelderland or Groningen or Limburg or "North Brabant" or Overijssel or Utrecht or Zeeland or Assen or Emmen or Lelystad or Leeuwarden or Arnhem or Maastricht or "'s-Hertogenbosch" or Haarlem or Zwolle or "The Hague" or Middelburg or Almere or Nijmegen or Eindhoven or Amsterdam or Enschede or Rotterdam or Bonaire or "Sint Eustatius" or Saba or "Algemene Wet Bijzondere Ziektekosten" or Zorgverzekeringswet or Zorginstituut)	62538
#51	MeSH descriptor: [New Zealand] explode all trees	947
#52	("New Zealand" OR "New Zealander" OR "New Zealanders" or Aotearoa or Wellington or Auckland or Christchurch or Maori or "North Island" or "South Island" or "Cook Islands" or "Stewart Island" or "Campbell Islands" or "Te Ika-a-Māui" or "Te Waipounamu" or Nieu or "Ross Dependency" or Tokelau or Otagu or Canterbury or Dunedin or Tauranga)	15672
#53	MeSH descriptor: [United States] explode all trees	18862
#54	("United States" or USA or "U. S." or America* or Alabama* or Alaska* or Arizona* or Arkansa* or California* or Colorad* or Connecticut or Delaware* or Florida or Floridian or Georgia* or Hawaii* or Hawai'i* or Idaho* or Illinois* or Indiana* or Iowa or Kansas or Kentucky* or Louisiana* or Maine* or Maryland* or Massachusetts* or Michigan* or Minnesota* or Mississippi* or Missouri* or Montana* or Nebraska* or Nevada* or "New Hampshire" OR "New hampshirite" OR "New Hampshirites" or	561798

	"New Jersey" OR "New Jerseyite" OR "New Jerseyites" OR "New Mexico" OR "New Mexican" OR "New Mexicans" or "New York" OR "New Yorker" OR "New Yorkers" or North Carolina* or North Dakota* or Ohio* or Oklahoma* or Oregon* or Pennsylvania* or "Rhode Island" OR "Rhode Islander" OR "Rhode Islanders" or South Carolina* or South Dakota* or Tennessee* or Texas or Texan or Utah* or Vermont* or Virginia* or Washington* OR "West Virginia" OR "West Virginian" OR "West Virginians" or Wisconsin* or Wyoming* or "American Samoa" OR "American Samoan" OR "American Samoans" or Guam or "Puerto Rico" OR "Puerto Rican" OR "Puerto Ricans" or "Northern Mariana Islands" or "U. S. Virgin Islands" or "Department of Veteran Affairs" OR "Department of Health and Human Services" OR HHS OR Medicare OR Medicaid)	
#55	#43 OR #44 OR #45 OR #46 OR #47 OR #48 OR #48 OR #49 OR #50 OR #51 OR #52 OR #53 OR #54	711566
#56	#42 AND #55	183
	Comprises 63 reviews, 5 protocols, 114 trials, 1 clinical answer.	
	-11 trials pre 1990, therefore 172 results	**172**

Database/repository: Core.ac.uk
Providers: JISC, Open University
Search date: 24 Aug 2020

Theme	Search terms	Results
Australia	title:("casemix" AND (australia OR australian OR victoria OR victorian OR queensland OR tasmania OR tasmanian)) abstract:("casemix" AND (australia OR australian OR victoria OR victorian OR queensland OR tasmania OR tasmanian)) AND year:[1990 TO 2020] (154 articles found)	
	title:("new south wales" AND (casemix)) abstract:("new south wales" AND (casemix)) AND year:[1990 TO 2020] (19 articles found)	
	title:("case-mix" AND (australia OR australian OR victoria OR victorian OR queensland OR tasmania OR tasmanian)) abstract:("case-mix" AND (australia OR australian OR victoria OR victorian OR queensland OR tasmania OR tasmanian)) AND year:[1990 TO 2020] (135 articles found)	
	title:("new south wales" AND ("case-mix")) abstract:("new south wales" AND ("case-mix")) AND year:[1990 TO 2020] (9 articles found)	
	Aged care classification	
Australia: Deduplicated results		131
Canada	title:("casemix" AND (canada OR canadian)) abstract:("casemix" AND (canada OR canadian)) AND year:[1990 TO 2020] (10 articles found)	
	title:("case-mix" AND (canada OR canadian)) abstract:("case-mix" AND (canada OR canadian)) AND year:[1990 TO 2020] (93 articles found)	
	title:((casemix AND alberta)) abstract:((casemix AND alberta)) AND year:[1990 TO 2020] (0 articles found)	
	title:("case-mix" AND (alberta)) abstract:("case-mix" AND (alberta)) AND year:[1990 TO 2020] (6 articles found)	
	title:("british colombia" AND (casemix)) abstract:("british colombia" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
	title:("british columbia" AND ("case-mix")) abstract:("british columbia" AND ("case-mix")) AND year:[1990 TO 2020] (6 articles found)	
	title:((casemix AND manitoba)) abstract:((casemix AND manitoba)) AND year:[1990 TO 2020] (1 articles found)	
	title:("new brunswick" AND (casemix)) abstract:("new brunswick" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
	title:("newfoundland" AND (casemix)) abstract:("newfoundland" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
	title:("labrador" AND (casemix)) abstract:("labrador" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
	title:("northwest territories" AND (casemix)) abstract:("northwest territories" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
	title:("nova scotia" AND (casemix)) abstract:("nova scotia" AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	

	title:((nunavut) AND (casemix)) abstract:((nunavut) AND (casemix)) AND year:[1990 TO 2020] (0 articles found)	
Canada: Deduplicated results		76
Germany	title:((casemix) AND (germany OR german OR deutsch OR deutsche)) abstract:((casemix) AND (germany OR german OR deutsch OR deutsche)) AND year:[1990 TO 2020] (5 articles found)	
	title:("case-mix" AND (germany OR german OR deutsch OR deutsche)) abstract:("case-mix" AND (germany OR german OR deutsch OR deutsche)) AND year:[1990 TO 2020] (51 articles found)	
Germany: Deduplicated results		38
The Netherlands	title:((casemix) AND (nederland OR netherlands OR holland OR dutch)) abstract:((casemix) AND (nederland OR netherlands OR holland OR dutch)) AND year:[1990 TO 2020] (44 articles found)	
	title:("case-mix" AND (nederland OR netherlands OR holland OR dutch)) AND year:[1990 TO 2020] (13 articles found) Note: This search string was limited to title only due to the amount of confounding results	
The Netherlands: Deduplicated results		31
New Zealand	title:("new zealand" AND (casemix OR "case-mix")) abstract:("new zealand" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (43 articles found)	
	title:("aotearoa" AND (casemix OR "case-mix")) abstract:("aotearoa" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("north island" AND (casemix OR "case-mix")) abstract:("north island" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("south island" AND (casemix OR "case-mix")) abstract:("south island" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("maori" AND (casemix OR "case-mix")) abstract:("maori" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
New Zealand: Deduplicated results		43
United States	title:("united states" AND (casemix OR "case-mix")) abstract:("united states" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (155 articles found)	
	title:("united states" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	Showing results for title:("usa" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (4 articles found)	
	Showing results for title:("america" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	Showing results for title:("american" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (11 articles found)	
	Showing results for title:("U.S." AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (14 articles found)	
	title:("arizona" AND (casemix OR "case-mix")) abstract:("arizona" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (4 articles found)	
	title:("alabama" AND (casemix OR "case-mix")) abstract:("alabama" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("alaska" AND (casemix OR "case-mix")) abstract:("alaska" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("arkansas" AND (casemix OR "case-mix")) abstract:("arkansas" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (2 articles found)	
	title:("california" AND (casemix OR "case-mix")) abstract:("california" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (31 articles found)	
	title:("Colorado" AND (casemix OR "case-mix")) abstract:("Colorado" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (5 articles found)	
	title:("Connecticut" AND (casemix OR "case-mix")) abstract:("Connecticut" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)	
	title:("Delaware" AND (casemix OR "case-mix")) abstract:("Delaware" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("Florida" AND (casemix OR "case-mix")) abstract:("Florida" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (10 articles found)	
	title:("Georgia" AND (casemix OR "case-mix")) abstract:("Georgia" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("Hawaii" AND (casemix OR "case-mix")) abstract:("Hawaii" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	

	title:("Hawai'i" AND (casemix OR "case-mix")) abstract:("Hawai'i" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)
	title:("Idaho" AND (casemix OR "case-mix")) abstract:("Idaho" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)
	title:("Illinois" AND (casemix OR "case-mix")) abstract:("Illinois" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Indiana" AND (casemix OR "case-mix")) abstract:("Indiana" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Iowa" AND (casemix OR "case-mix")) abstract:("Iowa" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (5 articles found)
	title:("Kansas" AND (casemix OR "case-mix")) abstract:("Kansas" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)
	title:("Kentucky" AND (casemix OR "case-mix")) abstract:("Kentucky" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Louisiana" AND (casemix OR "case-mix")) abstract:("Louisiana" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Maine" AND (casemix OR "case-mix")) abstract:("Maine" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (7 articles found)
	title:("Maryland" AND (casemix OR "case-mix")) abstract:("Maryland" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (12 articles found)
	title:("Massachusetts" AND (casemix OR "case-mix")) abstract:("Massachusetts" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (23 articles found)
	title:("Michigan" AND (casemix OR "case-mix")) abstract:("Michigan" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (11 articles found)
	title:("Minnesota" AND (casemix OR "case-mix")) abstract:("Minnesota" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (10 articles found)
	title:("Mississippi" AND (casemix OR "case-mix")) abstract:("Mississippi" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)
	title:("Missouri" AND (casemix OR "case-mix")) abstract:("Missouri" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Montana" AND (casemix OR "case-mix")) abstract:("Montata" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)
	title:("Nebraska" AND (casemix OR "case-mix")) abstract:("Nebraska" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (2 articles found)
	title:("Nevada" AND (casemix OR "case-mix")) abstract:("Nevada" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)
	title:("New Hampshire" AND (casemix OR "case-mix")) abstract:("New Hampshire" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (2 articles found)
	title:("New Jersey" AND (casemix OR "case-mix")) abstract:("New Jersey" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)
	title:("New Mexico" AND (casemix OR "case-mix")) abstract:("New Mexico" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("New York" AND (casemix OR "case-mix")) abstract:("New York" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (25 articles found)
	title:("North Carolina" AND (casemix OR "case-mix")) abstract:("North carolina" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (4 articles found)
	title:("North Dakota" AND (casemix OR "case-mix")) abstract:("North Dakota" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Ohio" AND (casemix OR "case-mix")) abstract:("Ohio" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)
	title:("Oklahoma" AND (casemix OR "case-mix")) abstract:("Oklahoma" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Oregon" AND (casemix OR "case-mix")) abstract:("Oregon" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)
	title:("Pennsylvania" AND (casemix OR "case-mix")) abstract:("Pennsylvania" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (9 articles found)

	title:("Rhode Island" AND (casemix OR "case-mix")) abstract:("Rhode Island" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("South Carolina" AND (casemix OR "case-mix")) abstract:("South Carolina" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("South Dakota" AND (casemix OR "case-mix")) abstract:("South Dakota" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)	
	title:("Tennessee" AND (casemix OR "case-mix")) abstract:("Tennessee" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)	
	title:("Texas" AND (casemix OR "case-mix")) abstract:("Texas" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (11 articles found)	
	title:("Utah" AND (casemix OR "case-mix")) abstract:("Utah" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)	
	title:("Vermont" AND (casemix OR "case-mix")) abstract:("Vermont" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (5 articles found)	
	title:("Virginia" AND (casemix OR "case-mix")) abstract:("Virginia" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (3 articles found)	
	title:("Washington" AND (casemix OR "case-mix")) abstract:("Washington" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (15 articles found)	
	title:("West Virginia" AND (casemix OR "case-mix")) abstract:("West Virginia" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
	title:("Wisconsin" AND (casemix OR "case-mix")) abstract:("Wisconsin" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (1 articles found)	
	title:("Wyoming" AND (casemix OR "case-mix")) abstract:("Wyoming" AND (casemix OR "case-mix")) AND year:[1990 TO 2020] (0 articles found)	
USA: deduplicated results:		120

Google Scholar Case-mix + home care: First 200 results per topic **https://scholar.google.com/** **Limit: 1990-present** **Search date: 25 Aug 2020** **Searched in Firefox version 79**	
Australia + home care + case-mix	200
Canada + home care + case-mix	200
Germany + home care + case-mix	200
New Zealand + home care + case-mix	200
The Netherlands + home care + case-mix	200
USA + home care + case-mix	200
Australia + residential care + case-mix	200
Canada + residential care + case-mix	200
Germany + residential care + case-mix	200
New Zealand + residential care + case-mix	200
The Netherlands + residential care + case-mix	200
USA + residential care + case-mix	200
Total	1200

Google.com First 50 results **Limit: 1990-present** **Search date: 26 Aug 2020** **Searched in Firefox version 79**	
Case-mix + home + residential + (Australia Canada Germany New Zealand The Netherlands USA)	50
Note: as searches for this topic returned many nursing home and care provider homepages rather than results, searches were limited to the first 50 results.	

REPEC Research papers in Economics IDEAS database: https://ideas.repec.org/ Search date: 25 Nov 2020 1985-2021 Search: All in Whole record		
Search terms	**Results**	**In scope**
Australia		
Case-mix + Australia	66	0
Casemix + Australia	9	0
"Homecare" + Australia	2	0
"Home care" + Australia	36	0
"Community care" + Australia	14	0
Residential care + Australian	61	0
"Resource utilization groups" + Australia	0	0
"Resource utilisation groups" + Australia	0	0
InterRAI + Australia	0	0
RUGIII + Australia	0	0
DRG + Australia	14	0
Diagnosis Related Groups + Australia	12	0
"AN-SNAP" + Australia	7	0
RAI + Australia + care	9	0
AR-DRG + Australia	3	0
Reimbursement + Australia + care	17	0
Medicare + Australia + home	3	0
Medicare + Australia + community	11	0
Diagnosis groups + Australia	0	0
"Prospective payment" + Australia	1	0
Care + funding + Australia	86	0
Canada		
Case-mix + Canada	49	0
Case-mix + Canadian	48	0
Casemix + Canada	1	0
Casemix + Canadian	1	0
"Homecare" + Canada	14	0
"Homecare" + Canadian	14	0
"Home care" + Canada	64	0
"Home care" + Canadian	63	0
Ambulatory diagnosis groups + Canada	0	0
"Residential care" + Canada	11	0
Residential care + Canadian	11	0
"Community care" + Canada	17	0
"Community care" + Canada	17	0
"Resource utilization group" + Canada	0	0
"Resource utilisation group" + Canadian	0	0
InterRAI + Canada	4	0
InterRAI + Canadian	4	0
RUGIII + Canada	0	0
RUG-III + Canada	0	0
DRG + Canada	4	0
DRG + Canadian	4	0
Diagnosis Related Groups + Canada	9	0
Diagnosis Related Groups + Canadian	9	0
RAI-HC + Canada	1	0
RAI + Canada + care	3	0
PRISMA + Canada	4	1 – already included (Hebert 2009)
Reimbursement + Canada + care	17	0
Medicare + Canada + home	0	0
Medicare + Canada + community	6	0
Medicare + Canada + residential	2	0

Medicare + Canada	60	0
"Care bands"	0	0
Prospective payment + Canada	1	0
Care + Canada + funding	107	0
Germany		
"Case-mix" + Germany	8	0
Case-mix + German	8	0
Casemix + Germany	1	0
Casemix + German	1	0
"Homecare" + Germany	3	0
"Homecare" + Germany	3	0
"Home care" + Germany	37	0
"Home care" + German	37	0
Diagnosis groups + Germany	59	0
"Residential care" + Germany	6	0
Residential care + German	6	0
"Community care" + Germany	2	0
"Community care" + Germany	2	0
"Resource utilization group" + Germany	0	0
"Resource utilisation group" + German	0	0
InterRAI + Germany	0	0
InterRAI + German	0	0
RUGIII + Germany	0	0
RUG-III + Germany	1	0
DRG + Germany	56	1
DRG + German	56	0
Diagnosis Related Groups + Germany	47	0
Diagnosis Related Groups + German	47	0
RAI-HC + Germany	0	0
RAI + Germany + care	7	0
reimbursement + Germany + care	74	00
Medicare + Germany + home	2	0
Medicare + Germany + community	3	0
Medicare + Germany + residential	0	0
Medicare + Germany	14	0
"Care bands"	0	0
Pflegegrade	2	0
Degrees of need + Germany	0	0
Pflegestufe	4	0
Prospective payment	16	0
Care + funding + Germany	70	0
The Netherlands		
"Case-mix" + Netherlands	9	0
"Case-mix" + Dutch	10	0
Casemix + Netherlands	1	0
Casemix + Dutch	0	0
"Homecare" + Netherlands	5	0
"Homecare" + Dutch	2	0
"Home care" + Netherlands	47	0
"Home care" + Dutch	26	0
Diagnosis groups + Netherlands	12	0
Diagnosis groups + Dutch	7	0
"Residential care" + Netherlands	12	0
"Residential care" + Dutch	7	0
"Community care" + Netherlands	5	0
"Community care" + Dutch	3	0
"Resource utilization group" + Netherlands	0	0
"Resource utilisation group" + Dutch	0	0
InterRAI + Netherlands	0	0
InterRAI + Dutch	0	0
RUGIII + Netherlands	0	0
RUGIII + Dutch	0	0
RUG-III + Netherlands	0	0

RUG-III + Dutch	0	0
DRG + Netherlands	6	0
DRG + Dutch	3	0
Diagnosis Related Groups + Netherlands	8	0
Diagnosis Related Groups + Dutch	3	0
RAI + Netherlands	3	0
RAI + Dutch	3	0
Reimbursement + Netherlands + care	39	0
Reimbursement + Dutch + care	22	0
Medicare + Netherlands + home	0	0
Medicare + Netherlands + community	0	0
Medicare + Netherlands + residential	0	0
Medicare + Netherlands	8	0
"Care bands"	0	0
Prospective payment + Netherlands	2	0
Prospective payment + Dutch	1	0
Degrees of need + Netherlands	0	0
New Zealand		
"Case-mix" + New Zealand	4	0
"Case-mix" + Maori	0	0
Casemix + New Zealand	2	0
Casemix + Maori	0	0
"Homecare" + New Zealand	0	0
"Homecare" + Maori	0	0
"Home care" + New Zealand	4	0
"Home care" + Maori	0	0
Diagnosis groups + New Zealand	0	0
Diagnosis groups + Maori	0	0
"Residential care" + New Zealand	8	0
"Residential care" + Maori	0	0
"Community care" + New Zealand	6	0
"Community care" + Maori	0	0
"Resource utilisation group" + New Zealand	0	0
"Resource utilization group" + New Zealand	0	0
"Resource utilisation group" + Maori	0	0
"Resource utilization group" + Maori	0	0
InterRAI + New Zealand	1	0
InterRAI + Maori	0	0
RUGIII + New Zealand	0	0
RUGIII + Maori	0	0
RUG-III + New Zealand	0	0
RUG-III + Maori	0	0
DRG + New Zealand	2	0
DRG + Maori	0	0
Diagnosis Related Groups + New Zealand	0	0
Diagnosis Related Groups + Maori	0	0
RAI + New Zealand	13	0
RAI + Maori	0	0
Reimbursement + New Zealand + care	5	0
Reimbursement + Maori + care	0	0
Medicare + New Zealand+ home	0	0
Medicare +Maori + home	0	0
Medicare + New Zealand + community	0	0
Medicare + Maori +community	0	0
Medicare + New Zealand + residential	0	0
Medicare + Maori + residential	0	0
Medicare + New Zealand	4	0
"care bands" +New Zealand	0	0
Prospective payment + New Zealand	1	0
Prospective payment + Maori	0	0
Degrees of need + New Zealand	0	0
Care + funding + New Zealand	32	0
USA		

"Case-mix" + "United States"	24	3 potential papers
"Case-mix" + America	8	0
Casemix + "United States"	3	0
Casemix + America	1	0
"Homecare" + "United States"	4	0
"Homecare" + America	3	0
"Home care" + "United States"	68	4
"Home care" + America	24	0
"Diagnosis groups" + "United States"	1	0
Diagnosis groups + America	0	0
"Residential care" + "United States"	22	0
"Residential care" + America	3	0
"Community care" + "United States"	51	1
"Community care" + America	20	0
"Resource utilisation group" + "United States"	0	0
"Resource utilization group" + "United States"	0	0
"Resource utilisation group" + America	0	0
"Resource utilization group" + America	0	0
InterRAI + "United States"	0	0
InterRAI + America	0	0
RUGIII + "United States"	0	0
RUGIII + America	0	0
RUG-III + "United States"	0	0
RUG-III + America	0	0
DRG + "United States"	4	0
DRG + America	35	0
Diagnosis Related Groups + "United States"	29	0
Diagnosis Related Groups + America	3	0
RAI + "United States"	438	0
RAI + America	110	0
Reimbursement + "United States" + care	145	3
Reimbursement + America + care	24	0
Medicare + "United States" + home	44	1
Medicare + America + home	10	0
Medicare + "United States" + community	30	1
Medicare + America + community	8	0
Medicare + "United States" + residential	4	0
Medicare + America + residential0	0	0
Medicare + "United States" + funding	18	0
Medicare + America	149	0
"Care bands" + United States	0	0
Prospective payment + "United States"	50	0
Prospective payment + America	6	0
Degrees of need + "United States"	0	0
Care + funding + "United States"	68	0

Websites searched for evaluation reports of care-bands **Search date: 25 Nov 2020**	
Australia	
Australian Department of Health	http://www.health.gov.au/
Australian Institute for Health and Welfare	https://www.aihw.gov.au/
Productivity Commission	https://www.pc.gov.au/
CSIRO	https://www.csiro.au/
NSW Dept of Health	https://www.health.nsw.gov.au/Pages/default.aspx
Queensland Dept of health	https://www.health.qld.gov.au/

South Australia Department of Health	https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet
Tasmania Department of Health	https://www.health.tas.gov.au/
Victoria Department of Health	https://www2.health.vic.gov.au/
Western Australia Department of Health	https://ww2.health.wa.gov.au/
Australian Capital Territory Department of Health	https://health.act.gov.au/
The Northern Territory Department of Health	https://health.nt.gov.au/
Australian National Audit Office	https://www.anao.gov.au/
Regional Australia Publications Library	http://www.regionalaustralia.org.au/home/?cat=12&tag=knowledge
The Melbourne Institute	https://melbourneinstitute.unimelb.edu.au/home
University of Queensland Centre for Health Services Research	https://chsr.centre.uq.edu.au/
Canada	
Health Canada	https://www.canada.ca/en/health-canada.html
Health Canada reports	https://www.canada.ca/en/health-canada/corporate/about-health-canada/reports-publications.html
Office of the Auditor General of Canada	http://www.oag-bvg.gc.ca/internet/English/admin_e_41.html
Canadian Institutes of Health Research	https://cihr-irsc.gc.ca/e/193.html
Germany	
German Federal Ministry of Health	https://www.bundesgesundheitsministerium.de/
German Federal Government	https://www.bundesregierung.de/
MDK (health insurance medical system)	https://www.mdk.de/
Federal Law Gazette	https://www.bgbl.de/
MDS (Medizinischer Dienst des Spitzenverbandes Bund der Krankenkassen e.V. (MDS))	https://www.mds-ev.de
Pflege (health information portal)	https://www.pflege.de/
New Zealand	
N. Z. Department of Health	https://www.health.govt.nz/
N.Z. National Audit Office	https://www.oag.govt.nz/
Research Institute: Centre for Health Services Research	http://www.hsraanz.org/hsraanz-publications-2/
Health Promotion and Policy Research Unit University of Otago	https://www.otago.ac.nz/heppru/index.html
The Netherlands	
Department of Health, Welfare and Sport	https://www.government.nl/ministries/ministry-of-health-welfare-and-sport
National institute for public health and the environment	https://www.rivm.nl/en
National healthcare authority	https://www.zorginstituutnederland.nl/
Dutch Healthcare inspectorate	https://www.igj.nl/
USA	
US Department of Health & Human Services	HHS.gov

Centers for Medicare & Medicaid Services	CMS.gov
US Medicare	Medicare.gov
US Medicaid	Medicaid.gov
National Institutes of Health	https://www.nih.gov/
General	
European Commission	https://ec.europa.eu/
Commonwealth Fund	https://www.commonwealthfund.org/
World Bank	https://openknowledge.worldbank.org/
Google	www.google.com

Appendix B Excluded full-text articles with reasons

Papers excluded from full text screening results of database searches (n=177)

1. Papers excluded on study design (n=82)
1. [No author]. News: National. Difficult to compare public and private sector. *Qld Nurse* 2010;29(1):10-11.
2. Acumen LLC. Skilled nursing facilities patient-driven payment model technical report: Acumen; 2018 Available from: https://www.cms.gov/medicare/medicare-fee-for-service-payment/snfpps/downloads/pdpm_technical_report_508.pdf
3. Advisory Board to Review the Definition of the Need for Long-term Care. Report by the Advisory Board to review the definition of the need for long-term care Germany: Bundesgesundheitsministerium; 2009 Available from: https://www.bundesgesundheitsministerium.de/fileadmin/Dateien/3_Downloads/E/Englische_Dateien/Report_by_the_advisory_board_to_review_the_definition_of_the_need_for_long-term_care.pdf
4. Australian Government. Department of Health. Proposal for a new residential aged care funding model: Australian Government. Department of Health; 2019 Available from: https://consultations.health.gov.au/aged-care-division/proposed-new-residential-aged-care-funding-model/
5. Baron C. Quality and accountability Canadian style. Comparative look at accreditation and resident classification systems between Canada and Australia 1999. Available from: http://www.ncbaron.com/pubdocs/CBaronNov99.pdf
6. Björkgren MA, Fries BE, Shugarman LR. A RUG-III case-mix system for home care*. *Can J Aging* 2000;19(S2):106-25. Available from: https://doi.org/10.1017/S0714980800013921
7. Björkgren MA, Fries BE, Shugarman LR. A RUG-III case-mix system for home care*. *Can J Aging* 2000;19(S2):106-25. Available from: https://doi.org/10.1017/S0714980800013921
8. Boyd T, Laff P, Tsiames M. Home health payment rates and the Medicare cost report: we did it to ourselves and it's happening again. *Caring* 2010;29(4):34-36, 38. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20572518
9. Branch LG, Goldberg HB. A preliminary case-mix classification system for Medicare home health clients. *Med Care* 1993;31(4):309-21. Available from: https://doi.org/10.1097/00005650-199304000-00003
10. Broyles R, Falcone D. Case-mix nursing home reimbursement: a technical "fix" for a policy inadequacy? *Int J Public Admin* 1997;20(2):339-77. Available from: https://doi.org/10.1080/01900699708525199
11. Casemix Project Group. The New Zealand casemix system – an overview Wellington: Ministry of Health; 2015 Available from: https://www.health.govt.nz/publication/new-zealand-casemix-system-overview-0
12. Centers for Medicare & Medicaid Services. Medicare and Medicaid programs; CY 2020 home health prospective payment system rate update; home health value-based purchasing model; home health quality reporting requirements; and home infusion therapy requirements. 2019-24026. *Fed Register* 2019;84:60478-646. Available from: https://www.federalregister.gov/documents/2019/11/08/2019-24026/medicare-and-medicaid-programs-cy-2020-home-health-prospective-payment-system-rate-update-home
13. Centers for Medicare & Medicaid Services. Medicare program; Prospective Payment System and consolidated billing for skilled nursing facilities; updates to the value-based purchasing program for federal fiscal Year 2021. *Fed Register* 2020;84:47594-633. Available from: https://www.federalregister.gov/documents/2020/08/05/2020-16900/medicare-program-prospective-payment-system-and-consolidated-billing-for-skilled-nursing-facilities
14. 1. Cheng C. Predictors of home care costs among persons with dementia, ALS and MS in Ontario [Masters Thesis] 2013 Available from: https://uwspace.uwaterloo.ca/handle/10012/7809
15. Colletti L, Hillhouse L. Profitability under PPS. Looking at both sides of the coin. *Contemp Longterm Care* 2001;24(9):38-40. Available from: http://www.ncbi.nlm.nih.gov/pubmed/11552302
16. Costa AP, Poss JW, McKillop I. Contemplating case mix: A primer on case mix classification and management. *Healthc Manage Forum* 2015;28(1):12-15. Available from: https://doi.org/10.1177/0840470414551866
17. Cumpston R. Submission on proposed residential aged care funding model: Australian Projections Pty Ltd. ; 2019 Available from: https://www.australianprojections.com.au/publications/submission-proposed-funding-model.
18. de Almeida Mello J, Cès S, Vanneste D. Chapter 6. Targeting frail older people at home to prevent admission to residential care: a case-mix study [Thesis]. KU Leuven, 2018.
19. De Almeida Mello J, Hermans K, Van Audenhove C, et al. Evaluations of home care interventions for frail older persons using the interRAI Home Care instrument: a systematic review of the literature. *J Am Dir Med Assoc* 2015;16(2):173.e1-10. Available from: https://doi.org/10.1016/j.jamda.2014.11.007

20. Douglass R, Lavery W, Bridgewater P, et al. Clinical case mix and other challenges to Detroit's Medicaid-dependent nursing homes. *Michigan J Public Health* 2006;1(1) Available from: https://scholarworks.gvsu.edu/mjph/vol1/iss1/7
21. Duggan JM. Quality of care under casemix. *Med J Aust* 1994;161(S1):S18-20. Available from: https://doi.org/10.5694/j.1326-5377.1994.tb138384.x
22. Eagar K. Development of an Australian classification and costing system for palliative care, rehabilitation and aged care services [Thesis]. University of Wollongong, 1998.
23. Eagar K, McNamee JP, Gordon R, et al. The Australian National Aged Care Classification (AN-ACC). The Resource Utilisation and Classification Study: Report 1: Australian Government. Department of Health,; 2019 Available from: https://www.health.gov.au/resources/publications/resource-utilisation-and-classification-study-rucs-reports.
24. Elliot S. PDGM/PDPM payment models: the impact on home health. Hartford, Connecticut: CareCentrix; 2020 Available from: https://www.carecentrix.com/blog/pdgm-pdpm-payment-models-the-impact-on-home-health.
25. Finnegan TP. The impact of casemix on the care of the elderly. *Z Gerontol Geriat* 2001;34(3):170-75. Available from: https://doi.org/10.1007/s003910170060
26. Flo J, Landmark B, Tønnessen S, et al. Patient classification systems used to classify nursing intensity and assess nursing staffing resources in home health care: A scoping review. *Int J Nurs Stud* 2019;99:103361. Available from: https://doi.org/10.1016/j.ijnurstu.2019.05.009
27. Fries BE, Schneider DP, Foley WJ, et al. Refining a case-mix measure for nursing homes: Resource Utilization Groups (RUG-III). *Med Care* 1994;32(7):668-85. Available from: https://doi.org/10.1097/00005650-199407000-00002
28. Galloro V. How some fared better under PPS. Smaller nursing-home providers survived switchover through cost-cutting. *Mod Healthc* 2001;31(26):20-21. Available from: http://www.ncbi.nlm.nih.gov/pubmed/11447641
29. Greenberg W. Insights from Canada, Israel, and the Netherlands. The Health Care Marketplace. New York: Springer 1998:pp152-64.
30. Gruchy J. Long term care in a Newfoundland region [Thesis]. Memorial University of Newfoundland, 2010.
31. Hall RE. Predicting home care expenditures in Ontario [Thesis]. University of Toronto, 2002.
32. Harrington C. Residential nursing facilities in the United States. *BMJ* 2001;323:507. Available from: https://doi.org/10.1136/bmj.323.7311.507
33. Harrison J, Rouse P, Sajtos L, et al. Product specification, categorisation and measurement: a study of case mix in home care services. ARA Conference. Manukau Institute of Technology, [no date].
34. Hébert R. Home care: from adequate funding to integration of services. *Healthc Pap* 2009;10(1):58-64; discussion 79-83. Available from: https://doi.org/10.12927/hcpap.2009.21224
35. Hébert R. Canada: application of a coordinated-type integration model for vulnerable older people in Québec: The PRISMA project. Handbook Integrated Care, 2017: pp499-510.
36. Hébert R, Durand PJ, Dubuc N, et al. PRISMA: a new model of integrated service delivery for the frail older people in Canada. *Int J Integr Care* 2003;3:e08. Available from: https://doi.org/10.5334/IJIC.73
37. Hébert R, Durand PJ, Dubuc N, et al. Frail elderly patients. New model for integrated service delivery. *Can Fam Physician* 2003;49(8):992-97. Available from: https://www.cfp.ca/content/49/8/992.long
38. Hébert R, Durand S, Somme D, et al. PRISMA in Québec and France: implementation and impact of a coordination-type integrated service delivery (ISD) system for frail older people. *Int J Integr Care* 2009;9(6) Available from: https://doi.org/10.5334/ijic.413
39. Heckman GA, Gray LC, Hirdes JP. Addressing health care needs for frail seniors in Canada: the role of InterRAI Instruments. *CGS Journal of CME* 2013;3(1):8-16. Available from: https://uwspace.uwaterloo.ca/handle/10012/11701
40. Heppenstall SA. Funding community care for older adults: testing the applicability of the interRAI case mix in three New Zealand District Health Boards [Thesis]. University of Otago, 2015.
41. Hirdes JP. Long term care funding in Canada: a policy mosaic. *J Aging Soc Policy* 2001;13(2-3):69-81. Available from: https://doi.org/10.1300/j031v13n02_06
42. Holly R. PDPM aftermath offers glimpse of home health therapy changes to come. *Home Health Care News* 2019 Available from: https://homehealthcarenews.com/2019/10/pdpm-aftermath-offers-glimpse-of-home-health-therapy-changes-to-come/
43. Howe AL. Rearranging the compartments: the financing and delivery of care For Australia's elderly. *Health Aff (Millwood)* 2000;19(3):57-71. Available from: https://doi.org/10.1377/hlthaff.19.3.57
44. James ML, Fries BE, Goodell M. Design principles for HCBS case mix: a primer: University of Michigan Institute of Gerontology 2015. Available from: http://www.advancingstates.org/hcbs/article/design-principles-hcbs-case-mix-primer.
45. Kane RA. Expanding the home care concept: blurring distinctions among home care, institutional care, and other long-term-care services. *Milbank Q* 1995;73(2):161-86. Available from: https://doi.org/10.2307/3350255

46. Kane RA, Haworth Editorial Submission. Dangers lurking in the "Continuum of Care". *J Aging Soc Policy* 1994;5(4):1-7. Available from: https://doi.org/10.1300/J031v05n04_01
47. Kellett A. New assessment tool to improve funding and innovation in elderly: The University of Auckland; 2018 Available from: https://www.auckland.ac.nz/en/news/2018/05/18/new-tool-improve-funding-elderly.html.
48. Kisvetrová H, Yamada Y. RAI-HC as an innovative tool for future practice in home care. *J Nurs Soc Stud Public Health Rehabil* 2014;1-2:16-22. Available from: http://casopis-zsfju.zsf.jcu.cz/journal-of-nursing-social-studies-public-health-and-rehabilitation/administrace/clankyfile/20140714131622829454.pdf
49. Knox KJ. An empirical examination of relative profitability in the nursing facility industry between ownership form and regionality in the state of Texas [Thesis]. Texas Medical Center Dissertations.1992:1-117. Available from: https://digitalcommons.library.tmc.edu/dissertations/AAI9401762
50. Krauchunas M. Examining California's Assemby Bill 1629 and the Long-term Care Reimbursement Act: did nursing home nurse staffing change? [Thesis] Virginia Commonwealth University, 2011. Available from: https://scholarscompass.vcu.edu/etd/2366/
51. Leuszler L. Prospective payment for rehabilitation and long-term care hospital payments. *J Wound Ostomy Continence Nurs* 1997;24(4):22A-24A. Available from: https://doi.org/10.1016/s1071-5754(97)90107-8
52. Martin K. New payment system has little effect on access and quality. *Find Brief* 2003;6(2):1-3. Available from: https://pubmed.ncbi.nlm.nih.gov/12678008/
53. Medicare Payment Advisory Commission (MedPAC). Home health care services payment system. Washington DC: Medicare Payment Advisory Commission (MedPAC); 2018 Available from: http://www.medpac.gov/docs/default-source/payment-basics/medpac_payment_basics_18_hha_final_sec.pdf?sfvrsn=0.
54. Meis M. Home care: where the elderly and chronic issues meet. *Home Health Care Manag Pract* 2001;13(6):458-61. Available from: https://doi.org/10.1177/108482230101300607
55. Mersiades N. Aged Care Update - A new funding model for personal care and nursing in residential aged care: Catholic Health Australia,; 2019 [Available from: https://www.cha.org.au/images/agedcare/2019/Aged%20Care%20Update%20-%20A%20new%20funding%20model%20for%20personal%20care%20and%20nursing%20in%20residential%20aged%20care.pdf.
56. Mery G. Public, private and informal homecare in Canada: what are the determinants of utilization and the interrelationships among different types of services [Thesis]. Toronto: Institute of Health Policy, Management and Evaluation, University of Toronto; 2013 Available from: http://ihpme.utoronto.ca/document/public-private-and-informal-homecare-in-canada-what-are-the-determinants-of-utilization-and-the-interrelationships-among-different-types-of-services/.
57. Miller EA. State discretion and Medicaid program variation in long-term care. *J Aging Soc Policy* 2002;14(3-4):15-35. Available from: https://doi.org/10.1300/J031v14n03_02
58. Ontario Ministry of Health and Long-Term Care. Policy: long-term care homes level-of-care per diem, occupancy and acuity-adjustment funding policy Ontario: Ontario Ministry of Health and Long-Term Care; 2019 Available from: http://www.health.gov.on.ca/en/public/programs/ltc/docs/level_of_care_per_diem_funding_policy.pdf.
59. Ostrovsky A, Cisneros A, Morgan A. Long-term supports and services as a logical next step in the evolution of bundled payments. *Ann Longterm Care* 2015
60. Ouslander JG, Weinberg AD, Phillips V. Inappropriate hospitalization of nursing facility residents: a symptom of a sick system of care for frail older people. *J Am Geriatr Soc* 2000;48(2):230-31. Available from: https://doi.org/10.1111/j.1532-5415.2000.tb03919.x
61. Parsons J, Parsons M, Rouse P, et al. The development of a case-mix system for aged residential care public report: Bupa Health Foundation; [no date] Available from: https://media.bupa.com.au/download/544969/casemixpublicreportmay2018.pdf. .
62. Parsons M. Basing care on need, not diagnosis. *Nurs N Z* 2015;21(10):2. Available from: https://pubmed.ncbi.nlm.nih.gov/26717612/
63. Phillips CD, Dyer J, Janousek V, et al. Providing appropriate services to individuals in the community: a preliminary case-mix for model allocating personal care services. *J Health Hum Serv Adm* 2008;30(4):378-401. Available from: http://www.ncbi.nlm.nih.gov/pubmed/18236696
64. Poss JW. Formal and informal resource utilization in long-stay home care clients: An evaluation of the RUG-III/HC case mix classification [PhD Thesis]. University of Waterloo, 2006.
65. Rantz MJ. Inadequate reimbursement for long-term care. The impact since hospital DRGs. *Nurs Health Care* 1990;11(9):470-72. Available from: https://pubmed.ncbi.nlm.nih.gov/2123527/
66. Reddy M. A proposal to restructure the long-term care sector in the St. John's region of Newfoundland and Labrador [Masters Thesis]. Memorial University of Newfoundland, 2002.
67. Rouse P, Harrison J, Sajtos L, et al. Variety attenuation: Case mix in home care services. Otago Forum-3: Academic Papers, 2011.
68. Sajtos L, Rouse P, Harrison J, et al. Case-mix system as a boundary object: the case of home care services. *Australas Mark J* 2014;22(3):189-96. Available from: https://doi.org/10.1016/j.ausmj.2014.08.003

69. Schlenker RE. Comparison of Medicaid nursing home payment systems. *Health Care Financ Rev* 1991;13(1):93-109. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4193230/
70. Semradek J, Hornbrook MC, McKenzie D, et al. Long-term care reform in Alberta, Canada. Alberta's resident classification system: fact, fiction and future prospects. *J Adv Nurs* 1994;20(6):1182-85. Available from: https://doi.org/10.1046/j.1365-2648.1994.20061182.x
71. Shih H-C, Temkin-Greener H, Votava K, et al. Medicare home health care patient case-mix before and after the Balanced Budget Act of 1997: Effect on dual eligible beneficiaries. *Home Health Care Serv Q* 2014;33(1):58-76. Available from: https://doi.org/10.1080/01621424.2013.870100
72. Shippee T, Davila H, Werner R, et al. Provider perceptions of the CMS 5-Star rating and organizational strategies to achieve higher scores. *Innov Aging* 2018;2(Suppl 1):539. Available from: https://doi.org/10.1093/geroni/igy023.1988
73. Street A, Vitikainen K, Bjorvatn A, et al. Introducing activity-based financing: a review of experience in Australia, Denmark, Norway and Sweden: Centre for Health Economics, University of York; 2007 Available from: https://ideas.repec.org/p/chy/respap/30cherp.html.
74. Tousignant M, Hébert R, Dubuc N, et al. Application of a case-mix classification based on the functional autonomy of the residents for funding long-term care facilities. *Age Ageing* 2003;32(1):60-66. Available from: https://doi.org/10.1093/ageing/32.1.60
75. Turcotte LA, Poss J, Fries B, et al. An overview of international staff time measurement validation studies of the RUG-III case-mix system. *Health Serv Insights* 2019;12:1178632919827926. Available from: https://doi.org/10.1177/1178632919827926
76. Uehara ES, Smukler M, Newman FL. Linking resource use to consumer level of need: field test of the level of need-care assessment (LONCA) method. *J Consult Clin Psychol* 1994;62(4):695-709. Available from: https://doi.org/10.1037/0022-006X.62.4.695
77. Unruh MA, Khullar D, Jung H-Y. The patient-driven payment model: addressing perverse incentives, creating new ones. *Am J Manag Care* 2020;26(4):150-52. Available from: https://doi.org/10.37765/ajmc.2020.42831
78. van der Roest H, van Lier L, Onder G, et al. A new approach to benchmark care practice based on costs and quality of care: the IBENC method. *Innov Aging* 2017;1:602-02. Available from: https://doi.org/10.1093/geroni/igx004.2108
79. Van Kesteren MP. Activity-based costing and inter-district flows in the New Zealand public health sector [Masters Thesis]. University of Wellington, 2014.
80. Van Nostrand JF. The focus of long-term care in the United States: nursing home care. *Can J Aging* 1996;15(S1):73-90. Available from: https://doi.org/10.1017/S0714980800005754
81. Weissert WS. Access, quality, and cost consequences of case-mix adjusted reimbursement: a critical review of the evidence. Washington DC: Public Policy Institute, AARP 1992.
82. Westera AB, M. S, Duncan C, et al. The AN-ACC assessment model. The Resource Utilisation and Classification Study: Report 2: Australian Health Services Research Institute; 2019 Available from: https://www.health.gov.au/sites/default/files/documents/2019/12/resource-utilisation-and-classification-study-rucs-reports-report-2-the-an-acc-assessment-model_0.pdf.

2. Papers excluded on intervention (n=55)

1. Abend-Wein M. Medicaid's effect on the elderly: how reimbursement policy affects priorities in the nursing home. *J Appl Gerontol* 1991;10(1):71-87. Available from: https://doi.org/10.1177/073346489101000106
2. Boorsma M, Langedijk E, Frijters DHM, et al. Implementation of geriatric assessment and decision support in residential care homes: facilitating and impeding factors during initial and maintenance phase. *BMC Health Serv Res* 2013;13(1):8. Available from: https://doi.org/10.1186/1472-6963-13-8
3. Buchanan RJ, Madel RP, Persons D. Medicaid payment policies for nursing home care: A national survey. *Health Care Financ Rev* 1991;13(1):55-72. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4193233/
4. Calver J, Holman CDA, Lewin G. A preliminary case-mix classification system for Home and Community Care Clients in Western Australia. *Aust Health Rev* 2004;27(2):27-39. Available from: https://doi.org/10.1071/ah042720027
5. Carey K, Zhao S, Snow AL, et al. The relationship between nursing home quality and costs: Evidence from the VA. *PLoS One* 2018;13(9):e0203764. Available from: https://doi.org/10.1371/journal.pone.0203764
6. Carpenter GI, Hirdes JP, Ribbe MW, et al. Targeting and quality of nursing home care. A five-nation study. *Aging Clin Exp Res* 1999;11(2):83-89. Available from: https://doi.org/10.1007/BF03399645
7. Courtney M, Minichiello V, Waite H. Aged care in Australia: A critical review of the reforms. *J Aging Stud* 1997;11(3):229-50. Available from: https://doi.org/10.1016/S0890-4065(97)90005-0
8. de Boer D, van der Hoek L, Rademakers J, et al. Do effects of common case-mix adjusters on patient experiences vary across patient groups? *BMC Health Serv Res* 2017;17(1):768. Available from: https://doi.org/10.1186/s12913-017-2732-z

9. Douglas J, Ravenswood K. The value of care: understanding the impact of the 2017 pay equity settlement on the residential aged care, home and community care and disability support sectors: New Zealand Work Research Institute; 2019 Available from: https://openrepository.aut.ac.nz/handle/10292/12391
10. Eagar K, McNamee JP, Kobel C, et al. Modelling the impact of the AN-ACC in Australia. The Resource Utilisation and Classification Study: Report 4, 2019. Available from: https://www.health.gov.au/sites/default/files/documents/2019/12/resource-utilisation-and-classification-study-rucs-reports-report-4-modelling-the-impact-of-the-an-acc-in-australia_0.pdf.
11. Easton LS, Cogen R, Fulcomer M. Effect of Medicare prospective payment system on a home health agency: Changes in patient population and services provided. *Appl Nurs Res* 1991;4(3):107-12. Available from: https://doi.org/10.1016/S0897-1897(05)80066-7
12. Grabowski DC. Medicaid reimbursement and the quality of nursing home care. *J Health Econom* 2001;20(4):549-69. Available from: https://doi.org/10.1016/S0167-6296(01)00083-2
13. Grabowski DC, Feng Z, Intrator O, et al. Recent trends in state nursing home payment policies. *Health Aff (Millwood)* 2004;23(Suppl web exclusives):W4-363-73. Available from: https://doi.org/10.1377/hlthaff.W4.363
14. Grabowski DC, Stevenson DG, Cornell PY. Assisted living expansion and the market for nursing home care. *Health Serv Res* 2012;47(6):2296-315. Available from: https://doi.org/10.1111/j.1475-6773.2012.01425.x
15. Gulley OD, Santerre RE. The effect of public policies on nursing home care in the United States. *East Econ J* 2003;29(1):93-104. Available from: https://www.jstor.org/stable/40326460
16. Hébert R, Veil A, Raîche M, et al. Evaluation of the Implementation of PRISMA, a coordination-type integrated service delivery system for frail older people in Québec. *J Integr Care* 2008;16(6):4-14. Available from: https://doi.org/10.1108/14769018200800041
17. Hirdes JP, Fries BE, Morris JN, et al. Home care quality indicators (HCQIs) based on the MDS-HC. *Gerontologist* 2004;44(5):665-79. Available from: https://doi.org/10.1093/geront/44.5.665
18. Howe AL, Kung F. Does assessment make a difference for people with dementia? The effectiveness of the Aged Care Assessment Teams in Australia. *Int J Geriatr Psychiatry* 2003;18(3):205-10. Available from: https://doi.org/10.1002/gps.817
19. Hsu A, Dass AR, Berta W, et al. Efficiency estimation with panel quantile regression: An application using longitudinal data from nursing homes in Ontario, Canada Canada: Canadian Centre for Health Economics; 2017 Available from: https://ideas.repec.org/p/cch/wpaper/170003.html
20. Iowa Department of Human Services. Nursing facilities private room supplementation report, May 2015 Iowa: Iowa Department of Human Services; 2015 Available from: https://www.legis.iowa.gov/docs/publications/DF/680022.pdf
21. Iowa Department of Human Services. Direct care worker in nursing facilities turnover report, December 2016 Iowa: Iowa Department of Human Services; 2016 Available from: http://publications.iowa.gov/25461/
22. Iowa Department of Human Services. Nursing facilities quality assurance assessment fee usage report, February 2017. Iowa: Iowa Department of Human Services, 2017.
23. Jacobs SP, Parsons M, Rouse P, et al. Using benchmarking to assist the improvement of service quality in home support services for older people-IN TOUCH (Integrated Networks Towards Optimising Understanding of Community Health). *Eval Program Plann* 2018;67:113-21. Available from: https://doi.org/10.1016/j.evalprogplan.2017.12.008
24. Kapoor A, Kader B, Cabral H, et al. Using the case mix of pressure ulcer healing to evaluate nursing home performance. *Am J Med Qual* 2008;23(5):342-49. Available from: https://doi.org/10.1177/1062860608316109
25. Keepnews D, Capitman JA, Rosati RJ. Measuring patient-level clinical outcomes of home health care. *J Nurs Scholarsh* 2004;36(1):79-85. Available from: https://doi.org/10.1111/j.1547-5069.2004.04017.x
26. Kendig H, Mealing N, Carr R, et al. Assessing patterns of home and community care service use and client profiles in Australia: a cluster analysis approach using linked data. *Health Soc Care Community* 2012;20(4):375-87. Available from: https://doi.org/10.1111/j.1365-2524.2011.01040.x
27. Khanna N, Shaya FT, Chirikov VV, et al. Impact of case mix severity on quality improvement in a Patient-Centered Medical Home (PCMH) in the Maryland Multi-Payor Program. *J Am Board Fam Med* 2016;29(1):116-25. Available from: https://doi.org/10.3122/jabfm.2016.01.150067
28. Kooreman P. Nursing home care in The Netherlands: a nonparametric efficiency analysis. *J Health Econ* 1994;13(3):301-16. Available from: https://doi.org/10.1016/0167-6296(94)90029-9
29. Laporte A, Croxford R, Coyte PC. Can a publicly funded home care system successfully allocate service based on perceived need rather than socioeconomic status? A Canadian experience. *Health Soc Care Community* 2007;15(2):108-19. Available from: https://doi.org/10.1111/j.1365-2524.2006.00672.x
30. Marek KD. Nursing diagnoses and home care nursing utilization. *Public Health Nurs* 1996;13(3):195-200. Available from: https://doi.org/10.1111/j.1525-1446.1996.tb00240.x
31. Mayo ME, Nadeau L, Levesque L, et al. Does the addition of functional status indicators to case-mix adjustment indices improve prediction of hospitalization, institutionalization, and death in the elderly? *Med Care* 2005;43(12):1194-202. Available from: https://doi.org/10.1097/01.mlr.0000185749.04875.cb

32. McArthur C, Hirdes J, Chaurasia A, et al. Quality changes after implementation of an episode of care model with strict criteria for physical therapy in Ontario's long-term care homes. *Health Serv Res* 2018;53(6):4863-85. Available from: https://doi.org/10.1111/1475-6773.13020
33. Mondor L, Maxwell CJ, Hogan DB, et al. The incremental health care costs of frailty among home care recipients with and without dementia in Ontario, Canada: a cohort study. *Med Care* 2019;57(7):512-20. Available from: https://doi.org/10.1097/MLR.0000000000001139
34. Probst JC, Bhavsar GP. Differences in case-mix between rural and urban recipients of home health care: South Carolina Rural Health Research Center; 2014. Available from: https://sc.edu/study/colleges_schools/public_health/research/research_centers/sc_rural_health_research_center/documents/123differencesincasemix2014.pdf
35. Raîche M, Hébert R, Dubois M-F, et al. Yearly transitions of disability profiles in older people living at home. *Arch Gerontol Geriatr* 2012;55(2):399-405. Available from: https://doi.org/10.1016/j.archger.2011.12.007
36. Rosati RJ. The care span: Medicare home health payment reform may jeopardize access for clinically complex and socially vulnerable patients. *Health Aff (Millwood)* 2014;33(6):946-56. Available from: https://doi.org/10.1377/hlthaff.2013.1159
37. Schlenker RE, Shaughnessy PW, Hittle DF. Patient-level cost of home health care under capitated and fee-for-service payment. *Inquiry* 1995;32(3):252-70. Available from: https://www.jstor.org/stable/29772555
38. Shaughnessy PW, Hittle DF, Crisler KS, et al. Improving patient outcomes of home health care: findings from two demonstration trials of outcome-based quality improvement. *J Am Geriatr Soc* 2002;50(8):1354-64. Available from: https://doi.org/10.1046/j.1532-5415.2002.50356.x
39. Shaughnessy PW, Schlenker RE, Hittle DF. Case mix of home health patients under capitated and fee-for-service payment. *Health Serv Res* 1995;30(1 Pt 1):79-113. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1070352/
40. Shippee TP, Hong H, Henning-Smith C, et al. Longitudinal changes in nursing home resident-reported quality of life: the role of facility characteristics. *Res Aging* 2015;37(6):555-80. Available from: https://doi.org/10.1177/0164027514545975
41. Smith BM, Maloy KA, Hawkins DJ. An examination of Medicare home health services. A descriptive study of the effects of the Balanced Budget Act interim payment system on access to and quality of care. *Care Manag J* 2000;2(4):238-47. Available from: http://www.ncbi.nlm.nih.gov/pubmed/11680908
42. Stewart KA, Grabowski DC, Lakdawalla DN. Annual expenditures for nursing home care: private and public payer price growth, 1977 to 2004. *Med Care* 2009;47(3):295-301. Available from: https://doi.org/10.1097/MLR.0b013e3181893f8e
43. Tousignant M, Dubuc N, Hébert R, et al. Home-care programmes for older adults with disabilities in Canada: how can we assess the adequacy of services provided compared with the needs of users? *Health Soc Care Community* 2007;15(1):1-7. Available from: https://doi.org/10.1111/j.1365-2524.2006.00645.x
44. Ubokudom SE, Woods JA, Schalk LS. The effects of case-mix reimbursement on Ohio Medicaid nursing home costs. *Policy Stud J* 2002;30(3):321-43. Available from: https://doi.org/10.1111/j.1541-0072.2002.tb02150.x
45. van Hout HPJ, Nijpels G, van Marwijk HWJ, et al. Design and pilot results of a single blind randomized controlled trial of systematic demand-led home visits by nurses to frail elderly persons in primary care [ISRCTN05358495]. *BMC Geriatr* 2005;5:11. Available from: https://doi.org/10.1186/1471-2318-5-11
46. van Lier L, Bosmans JE, van der Roest HG, et al. Development and validation of a prediction model for six-month societal costs in older community care-recipients in multiple countries; the IBenC study [Preprint]. *ResearchSquare* 2019 Available from: https://doi.org/10.21203/rs.2.16402/v1
47. van Lier LI, van der Roest HG, Oosten BSH, et al. Predictors of societal costs of older care-dependent adults living in the community in 11 European countries. *Health Serv Insights* 2019;12:1178632918820947. Available from: https://doi.org/10.1177/1178632918820947
48. Van Lier LI, van der Roest HG, van Hout HPJ, et al. Benchmark community care models for care-dependent older persons on costs of care (WP5): iBENC Consortium; 2016 Available from: https://www.kuleuven.be/lucas/nl/Publicaties/publi_upload/benchmark-community-care-models.
49. van Noort O, Schotanus F, van de Klundert J, et al. Explaining regional variation in home care use by demand and supply variables. *Health Policy* 2018;122(2):140-46. Available from: https://doi.org/10.1016/j.healthpol.2017.05.003
50. Weech-Maldonado R, Shea D, Mor V. The relationship between quality of care and costs in nursing homes. *Am J Med Qual* 2006;21(1):40-48. Available from: https://doi.org/10.1177/1062860605280643
51. Wodchis WP. Applying activity-based costing in long term care. *Healthc Manage Forum* 1998;11(4):25-32. Available from: https://doi.org/10.1016/S0840-4704(10)61020-4
52. Wübker A, Zwakhalen SMG, Challis D, et al. Costs of care for people with dementia just before and after nursing home placement: primary data from eight European countries. *Eur J Health Econ* 2015;16(7):689-707. Available from: https://doi.org/10.1007/s10198-014-0620-6

53. Yan D, Wang S, Temkin-Greener H, et al. Quality of nursing homes and admission of residents with Alzheimer's disease and related dementias: the potential influence of market factors and state policies. *J Am Dir Med Assoc* 2020;21(11):1671-76.e1. Available from: https://doi.org/10.1016/j.jamda.2020.04.028
54. Zinn J, Feng Z, Mor V, et al. Restructuring in response to case mix reimbursement in nursing homes: a contingency approach. *Health Care Manage Rev* 2008;33(2):113-23. Available from: https://doi.org/10.1097/01.HMR.0000304506.12556.52
55. Zuidgeest M, Delnoij DMJ, Luijkx KG, et al. Patients' experiences of the quality of long-term care among the elderly: comparing scores over time. *BMC Health Serv Res* 2012;12(1):26. Available from: https://doi.org/10.1186/1472-6963-12-26

3. Papers excluded on setting (n=13)

1. Balnave L-M, Reid BA. Mature use of casemix - are we there yet? *Aust Health Rev* 2007;31 S59-67. Available from: https://doi.org/10.1071/ah070s59
2. Braithwaite J, Hindle D, Phelan PD, et al. Casemix funding in Australia. *Med J Aust* 1998;168(11):558-62. Available from: https://doi.org/10.5694/j.1326-5377.1998.tb139084.x
3. Coffey R. Casemix information in the United States: fifteen years of management and clinical experience. *Casemix Q* 1999;1(1) Available from: http://www.casemix.org/pubbl/pdf/1_1_1.pdf
4. Eagar K, Cromwell D, Kennedy C, et al. Classifying sub-acute and non-acute patients: Results of the New South Wales Casemix Area Network study. *Aust Health Rev* 2015;20(2):26-42. Available from: https://doi.org/10.1071/ah970026
5. Eagar K, Gordon R, Hodkinson A, et al. The Australian National Sub-Acute and Non-acute Patient Classification (AN- SNAP): report of the National Sub-Acute and Non-Acute Casemix Classification Study. Paper 7 Australia: Centre for Health Service Development; 1997 Available from: http://ro.uow.edu.au/chsd/7
6. Hindle D. The Australian DRG classification: are we ready for structural changes? *Aust Health Rev* 2019;24(3):16-21. Available from: https://doi.org/10.1071/ah010016
7. Lee L, Kennedy C, Aitken J. Does the NAIP classification predict length of stay in rehabilitation, geriatrics and palliative care? *Aust Health Rev* 2014;19(2):56-74. Available from: https://doi.org/10.1071/ah960056
8. Mendez CM, Harrington DW, Christenson P, et al. Impact of hospital variables on case mix index as a marker of disease severity. *Popul Health Manag* 2013;17(1):28-34. Available from: https://doi.org/10.1089/pop.2013.0002
9. Nicosia N, Reardon E, Lorenz K, et al. The Medicare hospice payment system: a consideration of potential refinements. *Health Care Financ Rev* 2009;30(4):47-59. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4195059/
10. Oostenbrink JB, Rutter FFH. Cost assessment and price setting in the Dutch healthcare system Rotterdam: Institute for Health Policy and Management, Erasmus MC Rotterdam; 2005 Available from: https://ehma.org/wp-content/uploads/2016/08/WP_6_HealthBASKETSP21_CT_2004_501588_D19_Netherlands.pdf
11. Robst J. Development of a Medicaid behavioral health case-mix model. *Eval Rev* 2009;33(6):519-38. Available from: https://doi.org/10.1177/0193841X09349420
12. Shin S, Schumacher C, Feess E. Do capitation-based reimbursement systems underfund tertiary healthcare providers? Evidence from New Zealand. *Health Econ* 2017;26(12):e81-e102. Available from: https://doi.org/10.1002/hec.3478
13. Steinbusch PJM, Oostenbrink JB, Zuurbier JJ, et al. The risk of upcoding in casemix systems: a comparative study. *Health Policy* 2007;81(2-3):289-99. Available from: https://doi.org/10.1016/j.healthpol.2006.06.002

4. Papers excluded on outcomes (n=10)

1. Adams-Wendling L. Clocking care hours with workload measurement tools. *Nurs Manage* 2003;34(8):34-39. Available from: https://doi.org/10.1097/00006247-200308000-00014
2. Büscher A, Wingenfeld K, Schaeffer D. Determining eligibility for long-term care—lessons from Germany. *Int J Integr Care* 2011;11:e019. Available from: https://doi.org/10.5334/ijic.584
3. Cheng C, Hirdes JP, Heckman G, et al. Predictors of home care costs Among persons with dementia, amyotrophic lateral sclerosis, and multiple sclerosis in Ontario. *Health Serv Insights* 2020;13 Available from: https://doi.org/10.1177/1178632920903731

4. Elliott MN, Hambarsoomian K, Edwards CA. Analysis of case-mix strategies and recommendations for Medicare Fee-for-Service CAHPS: case-mix adjustment report: 2003: RAND Corporation; 2005 Available from: https://www.rand.org/pubs/working_papers/WR307.html
5. Hasman A, Wiersma D, Halfens R, et al. Evaluation of a patient classification system for community health care. *Int J Bio-Med Comput* 1993;33(2):109-18. Available from: https://doi.org/10.1016/0020-7101(93)90028-5
6. Hébert R, Veil A. Monitoring the degree of implementation of an integrated delivery system. *Int J Integr Care* 2004;4:e05. Available from: https://doi.org/10.5334/ijic.106
7. Spector W, Limcangco R, Ladd H, et al. Incremental cost of postacute care in nursing homes. *Health Serv Res* 2010;46:105-19. Available from: https://doi.org/10.1111/j.1475-6773.2010.01189.x
8. Straker JK, Bailer AJ, Hughes MR. Comparing case-mix scores derived by facility MDS assessors and independent raters: Report to the state MEDTAPP program; 2011 Available from: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.197.1854&rep=rep1&type=pdf
9. Toye CRA. Normalisation process theory and the implementation of Resident Assessment Instrument–Home Care in Saskatchewan, Canada: a qualitative study. *Home Health Care Manag Pract* 2016;28(3):161-69. Available from: https://doi.org/10.1177/1084822315619742
10. White C, Pizer SD, White AJ. Assessing the RUG-III resident classification system for skilled nursing facilities. *Health Care Financ Rev* 2002;24(2):7-15. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4194794/

5. Papers excluded on location (n=7)

1. Donaldson C, Bond J. Cost of continuing-care facilities in the evaluation of experimental National Health Service nursing homes. *Age Ageing* 1991;20(3):160-68. Available from: https://doi.org/10.1093/ageing/20.3.160
2. Elissen A, Metzelthin S, Bulck A, et al. Case-mix classificatie als basis voor bekostiging van wijkverpleging. Een verkennend onderzoek in opdracht van MeanderGroep Zuid-Limburg. Maastricht, Netherlands: Datawyse/ Universitaire Pers Maastricht 2017.
3. Hughes J, Chester H, Challis D. Home care services for older people: findings from a national survey of social care commissioners. *Res Policy Plann* 2013;30(1):51-64.
4. Kim H, Jung Y-I, Sung M, et al. Reliability of the interRAI Long Term Care Facilities (LTCF) and interRAI Home Care (HC). *Geriatr Gerontol Int* 2015;15(2):220-28. Available from: https://doi.org/10.1111/ggi.12330
5. Lee MY, Kim EK. [Relationship between resource utilization and long-term care classification level for residents in nursing homes]. *J Korean Acad Nurs* 2010;40(6):903-12. Available from: https://doi.org/10.4040/jkan.2010.40.6.903
6. Morales-Asencio JM, Morilla-Herrera JC, Martín-Santos FJ, et al. The association between nursing diagnoses, resource utilisation and patient and caregiver outcomes in a nurse-led home care service: longitudinal study. *Int J Nurs Stud* 2009;46(2):189-96. Available from: https://doi.org/10.1016/j.ijnurstu.2008.09.011
7. Rothera I, Jones R, Harwood R, et al. Health status and assessed need for a cohort of older people admitted to nursing and residential homes. *Age Ageing* 2003;32(3):303-09. Available from: https://doi.org/10.1093/ageing/32.3.303

6. No text available (n=6)

1. [no author]. RUGS III rates from the health care financing administration's nursing home case-mix payment and quality demonstration project. *Natl Rep Subacute Care* 1997;5(17):5-7. Available from: https://pubmed.ncbi.nlm.nih.gov/10173325/
2. Buchanan RJ. Medicaid payment policies for nursing home care: case mix, access, and heavy care. *J Health Admin Educat* 1992;10(4):623-48. Available from: https://pubmed.ncbi.nlm.nih.gov/10127070/
3. Harrison J, Parsons M, Rouse P, et al. Case mix in home care: non-complex and complex analysis, 2011.
4. Love M, Khanna R. Home health care, managed care, and capitation. *Healthc Inf Manage* 1996;10(2):57-60. Available from: https://pubmed.ncbi.nlm.nih.gov/10157649/
5. Koster NM, Harmsen J, Van der Palen J. Analyzing client characteristics and needs in home health care: University of Twente, 2015.
6. Parsons M. Profiles and pathway development within home care in New Zealand. Auckland, New Zealand: University of Auckland, 2016.

7. Excluded on date (n=1)

1. Schlenker RE, Shaughnessy PW. Case mix, quality, and cost relationships in Colorado nursing homes. *Health Care Financ Rev* 1984;6(2):61-71. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4191465/

8. Excluded on funding source (n=1)

1. Gray B, Sarnak DO, Burgers J. Home care by self-governing nursing teams: the Netherlands' Buurtzorg model: Commonwealth Fund; 2015 Available from: https://www.commonwealthfund.org/publications/case-study/2015/may/home-care-self-governing-nursing-teams-netherlands-buurtzorg-model

9. Papers excluded on language (n=1)

1. Stolle C. ["Implications and effects of the Resident Assessment Instrument (RAI Home Care 2.0) in ambulatory nursing care"]. *Pflege* 2013;26(2):145-46. Available from: https://doi.org/10.1024/1012-5302/a00279

10. Papers excluded on population (n=1)

1. Snoeijs S, Struckmann V, van Ginneken E. INCA programme, Netherlands. ICARE4EU project: case report Utrecht, The Netherlands: NIVEL; 2015. Available from: http://www.icare4eu.org/pdf/INCA_Case_report.pdf.

Appendix C Remainder of care sectors with care profile descriptions in the Netherlands

Physical disability

One care sector, 'physically handicapped ', corresponds with the foundation of care 'physical disability'. The relevant care profiles mapped to the relevant care weight packages are listed in Table 62, followed by a description of each profile.[103]

Table 62 Physically handicapped sector care profiles

Physically handicapped sector	Care weight package
Living with guidance and some care	2LG
Living with guidance and care	4LG
Living with guidance and intensive care	5LG
Living with intensive guidance and intensive care	6LG
Living with very intensive guidance and very intensive care	7LG

Living with guidance and some care

Clients are moderately physically handicapped and have limited independent social functioning within an agreed, fixed structure. Clients are approached in an unambiguous manner.

Clients are unable to independently direct their own lives and therefore have a daily need for help with regard to social independence. This is especially the case with maintaining and establishing social contacts, decision-making and problem-solving skills, simple tasks, and household life. It is sometimes necessary for carers to take over performing complex tasks.

Clients need guidance in the form of help, supervision, or direction with regard to their psychosocial/cognitive functions. The intensity can vary. This is often the case in particular in the areas of concentration, memory and thinking, information processing, perception of oneself, and sensitivity to stimuli.

Clients can largely perform a lot of activities of daily living (ADLs) themselves, but there is a need for supervision and stimulation with, for example, small grooming tasks; personal care for teeth, hair, nails, and skin; and when eating and drinking. Help may be needed when washing and dressing.

With regard to mobility, the client can largely manage on their own, although supervision or stimulation is required from time to time. This mainly concerns moving outside.

Occasionally, nursing attention may be required.

There may be behavioural problems; the client may occasionally need help, supervision, and direction, particularly due to manipulative, compulsive, disinhibited, and reactive behaviour.

Psychiatric problems can sometimes occur with these clients, whether active or passive in nature.

The dominant basis for this client profile is usually a physical disability (functional disorder).

Living with guidance and care

Clients are severely physically handicapped and have limited independent social functioning within an agreed, fixed structure. Clients are approached in an unambiguous way.

Clients cannot independently take charge of their own lives and therefore often need help with tasks with regard to social self-reliance, or they need these tasks done for them – for example, participating in social life, running a household, their daily routine, performing simple tasks, and with regard to

decision-making and problem-solving skills. It is often necessary for carers to take over performing complex tasks.

Clients need guidance in the form of help, supervision, or direction with regard to their psychosocial/cognitive functions. The intensity can vary. Help, supervision, or guidance is often required from counsellors, particularly with regard to concentration, memory and thinking, information processing, perception of oneself, and sensitivity to stimuli.

Clients need at least supervision or stimulation in all aspects of ADLs, but often need help as well (for example, with small grooming tasks, washing and dressing, getting in and out of bed, and going to the toilet).

With regard to mobility, at least supervision or stimulation is required, but often help is required as well. Clients need help making transfers, moving around indoors, and moving around outdoors. Relocation and transfers usually require aids.

Nursing attention is regularly required.

There may be behavioural problems, and the client may occasionally need help, supervision, and direction due to manipulative, compulsive, disinhibited, and reactive behaviours in particular.

These clients can sometimes also have psychiatric problems, whether active or passive in nature.

The nature of the guidance objective is often aimed at stabilisation, and sometimes at development or guidance in the event of deterioration.

The dominant basis for this client profile is usually a physical disability (functional disorder).

Living with guidance and intensive care

Clients are very severely physically handicapped and function socially independently largely within a certain structure.

Clients can reasonably be in control of their own lives, but they do need supervision or stimulation, and, in some cases, help with regard to social self-reliance. This is especially the case when performing complex tasks and in terms of practical matters in household life.

Clients occasionally need help, supervision, or guidance with regard to their psychosocial/cognitive functions. This can especially be the case with memory and thinking, information processing, and the psychosocial well-being of the clients. Clients have a good sense of time, place, and self.

The client is completely dependent on help with performing ADLs, and requires carers to help with or take over tasks. It is possible that two carers are regularly required to take over care of the client.

With regard to mobility, clients need help, and sometimes require carers to take over. The client may depend on an electric wheelchair, complicated transfers, environmental controls, and aids. With regard to motor skills, help, supervision, or direction is often required.

Regular or frequent nursing attention is required. This may also include specialised nursing, which may involve the immediate availability of a nurse.

Usually there are no behavioural or psychiatric problems.

Any treatment is aimed at complications and the prevention thereof.

The dominant basis for this client profile is usually a physical disability (functional disorder).

Living with intensive guidance and intensive care

Clients are very severely physically handicapped and have limited independent social functioning within an agreed, fixed structure. They are approached in an unambiguous way.

The clients themselves are unable to direct their own lives. They need help with tasks with regard to social self-reliance, or they need these tasks done for them. Takeover mainly occurs with regard to participation in social life, making decisions, and performing simple and complex tasks.

Clients occasionally to often need help, supervision, or guidance with regard to their psychosocial/cognitive functions. This is more often necessary in the case of memory and thinking, concentration, self-perception, and the client's sensitivity to stimuli.

The client is completely dependent on help with performing ADLs, and requires carers to help with or take over tasks. It is possible that two carers are regularly required to take over care of the client.

With regard to mobility, carers are required to help and take over, both for moving indoors and outdoors. With regard to motor skills, help, supervision, or direction is often required.

Regular to frequent nursing attention is required. This may also include specialised nursing, which may involve the immediate availability of a nurse.

There may be behavioural problems, and the client may occasionally need help, supervision, and direction, particularly due to manipulative, compulsive, and reactive behaviour.

These clients sometimes also have psychiatric problems, either active or passive in nature.

Any treatment is aimed at complications and the prevention thereof.

The dominant basis for this client profile is usually a physical disability (functional disorder).

Living with very intensive guidance and very intensive care

Clients are very seriously physically handicapped, have very limited independent social functioning, and must be approached in an unambiguous manner.

Clients are unable to direct their own lives and therefore need total takeover with regard to social self-reliance. This concerns maintaining social relationships, communication, participation in social life, performing tasks, and arranging their daily routine.

Clients often require continuous help, supervision, or direction with regard to their psychosocial/cognitive functions. Continuous help, supervision, or direction can be required in particular with regard to memory and thinking, concentration, the client's perception of themselves, and their sensitivity to stimuli. Spatial and interpersonal orientation is often limited to the daily environment and people in the immediate vicinity. These clients' sense of time is often limited.

The client is completely dependent in terms of performing ADLs. It is possible that two carers are regularly required to take over care of the client.

With regard to mobility, full takeover is required, both outdoors and indoors. Clients often have difficulty with spatial orientation. With regard to motor skills, help, supervision, or direction is required almost continuously.

Regular to frequent nursing attention is required. This may also include specialised nursing, which may involve the immediate availability of a nurse.

There are often behavioural problems arising from geriatric or sometimes psychiatric problems, and clients need occasional to frequent help, supervision, and direction. In particular, clients may often need help, supervision, and direction because of compulsive, disinhibited, and reactive behaviour.

There may be psychiatric problems, either active or passive in nature.

Counselling is aimed at slowing or stabilising functional decline. Clients have a structural care need at both planned and unplanned times.

Treatment is aimed at complications and the prevention thereof.

The dominant basis for this client profile is usually a physical disability (functional disorder).

Sensory disability

Two care sectors, 'sensory disabled – auditory and communicative ' and 'sensory disabled – visual, correspond with the foundation of care 'sensory disability'. The relevant care profiles mapped to the relevant care weight packages are listed in Table 63 and Table 64, followed by a description of each profile. .[103]

Sensory disabled sector – auditory and communicative

Table 63 Sensory disabled sector – auditory and communicative care profiles

Sensory disabled sector – auditory and communicative	Care weight package
Living with intensive guidance and care	2ZGaud
Living with intensive guidance and intensive care	3ZGaud
Living with intensive guidance and some care	4ZGaud

Living with intensive guidance and care

The clients are hearing and/or communicatively handicapped and have multiple, but minor, problems.

Clients need help with tasks with regard to social self-reliance, or they need these tasks done for them. This can be especially the case with communication, participation in social life, daily routine, decision-making and problem-solving skills, and when performing simple and complex tasks.

Clients often need continuous help, supervision, or direction with regard to their psychosocial/cognitive functions. Continuous help, supervision, or direction can be required in particular with regard to memory and thinking, concentration, perception of oneself and the environment, and the client's sensitivity to stimuli.

Clients need supervision and stimulation, and sometimes help, with regard to ADLs. Help may be needed in particular with minor grooming tasks; personal care for teeth, hair, nails, and skin; and washing.

Clients need supervision and stimulation with regard to mobility. Clients often need help, especially when moving away from home.

Some (specialist) nursing attention may be required.

There may be behavioural problems, and help, supervision, or direction is required from time to time. Particularly in the case of compulsive and reactive behaviour with regard to interaction, there may be a greater need for help, supervision, or direction.

There may be psychiatric problems, which are often active and sometimes passive or variable in nature.

The nature of the guidance objective is often aimed at development, and sometimes also at stabilisation. Clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Living with intensive guidance and intensive care

The clients are hearing impaired and/or communicatively handicapped and have multiple serious problems.

Clients are not socially self-reliant and need carers to take over with regard to social independence.

Clients often need continuous help, supervision, or direction with regard to their psychosocial/cognitive functions. Continuous help, supervision, or direction can be required in particular with regard to memory and thinking, concentration, perception of oneself and the environment, and the client's sensitivity to stimuli.

Clients are unable to perform ADLs themselves or can only do so with great difficulty, and assistance is often provided for these tasks. It may sometimes be necessary for carers to take over performing certain tasks instead of simply helping the client, particularly with regard to small grooming tasks; personal care for teeth, hair, nails, and skin; and washing.

Clients often need help, supervision, or stimulation with regard to mobility. This is especially the case with regard to spatial orientation and movement outdoors.

Some (specialist) nursing attention may be required.

There may be behavioural problems, in which case help, supervision, or direction is required occasionally to frequently.

There is also often a question of psychiatric problems, which can often be active, but may also be passive or variable in nature.

The nature of the guidance objective is often aimed at development, and sometimes at stabilisation. Clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Living with intensive guidance and some care

Clients are hearing and/or communicatively handicapped. There are additional problems.

Clients regularly need help with regard to social independence. This can be the case in particular with regard to communication, participation in social life, daily routine, and performing simple tasks. Decision-making and problem-solving skills and performing complex tasks can involve carer takeover.

Clients often need help, supervision, or direction with regard to their psychosocial/cognitive functions. Particularly with regard to the clients' information processing, memory and thinking, sensitivity to stimuli, perception of oneself and the environment, self-determination, and psychosocial well-being, help, supervision, or direction is more often required.

The clients are largely able to perform ADLs themselves, with occasional supervision or stimulation needed. This can be especially the case with personal care, such as washing, or eating and drinking.

Clients are usually independent with regard to mobility.

Clients sometimes need supervision or guidance, especially when moving away from home.

There is usually no need for nursing.

There may be behavioural problems which occasionally require supervision or direction, particularly in the case of reactive behaviour with regard to interaction, manipulative behaviour, and compulsive behaviour.

There may be psychiatric problems, which may be active or passive in nature.

The nature of the guidance objective is often aimed at development, and sometimes also at stabilisation. Clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Sensory disabled sector – visual

Table 64 Sensory disabled sector – visual care profiles

Sensory disabled sector – visual	Care weight package
Living with guidance and some care	2ZGvis
Living with intensive guidance and care	3ZGvis
Living with intensive guidance and intensive care	4ZGvis
Living with very intensive guidance and very intensive care	5ZGvis

Living with guidance and some care

The clients are simply visually impaired and have other moderate problems.

Clients need supervision and stimulation, and sometimes help, with regard to self-reliance. Help is particularly needed in participating in social life, performing simple and complex tasks, and with regard to decision-making and problem-solving skills.

Clients need regular help, supervision, or direction with regard to their psychosocial/cognitive functions. Particularly with regard to information processing, perception of the environment and themselves, and the client's sensitivity to stimuli, there is more often a need for help, supervision, or guidance.

Clients can perform most ADLs themselves, but they do need regular supervision or stimulation. Taking over these tasks may be especially necessary when it comes to children.

Clients are fairly independent with regard to mobility, although supervision or stimulation is required from time to time. Help may sometimes be needed when moving outside.

Nursing is not, or only to a limited extent, appropriate for these clients.

Usually there are no behavioural problems.

Psychiatric problems may arise, whether active or passive in nature.

The nature of the guidance objective is often aimed at development or stabilisation. Clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Living with intensive guidance and care

The clients are visually impaired and have other serious problems.

Clients need help, but sometimes take charge, with regard to social independence. Help is needed with regard to communication (understanding what others say, making themselves understood; and reading, writing, and calculating). Carers may need to take over regarding the client's participation in social life, making decisions, performing simple and complex tasks, and arranging a daily routine.

Clients need regular help, supervision, or direction with regard to their psychosocial/cognitive functions. Particularly with regard to the clients' information processing, perception of the environment and themselves, and sensitivity to stimuli, there may be a greater need for help, supervision, or direction.

With regard to ADLs, clients particularly need supervision and stimulation, and sometimes need help, especially with minor grooming tasks and personal care for teeth, hair, nails, and skin and with dressing and undressing.

Clients are reasonably independent with regard to mobility, although supervision or stimulation is required from time to time. Help is usually required when moving outdoors and with orientation in rooms, and sometimes also when moving indoors.

Nursing is not, or only to a limited extent, appropriate for these clients.

There may be behavioural and psychiatric problems, which may be both active and passive in nature.

The nature of the guidance objective is mainly aimed at development and, to a lesser extent, at stabilisation or slowing of functional decline. Clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Living with intensive guidance and intensive care

The clients are visually impaired and have multiple serious problems.

The clients need carers to help and take over with regard to social self-reliance. In particular, takeover may be necessary with participation in social life, communication, household life, arranging a daily routine, and when performing simple and complex tasks.

Clients often need help, supervision, or direction with regard to their psychosocial/cognitive functions. This may be particularly necessary with regard to concentration, memory and thinking, perception of the environment and themselves, and the client's sensitivity to stimuli.

Clients generally need help with ADLs. Taking over these tasks may sometimes be necessary with regard to minor grooming tasks; personal care for teeth, hair, nails, and skin; washing; and dressing.

Clients especially need carers to help or take over with regard to mobility. Help is needed with moving indoors, whereas takeover is needed with regard to moving outdoors and spatial orientation. Occasionally there may also be a need for help, supervision, or guidance with regard to motor skills.

Nursing is not, or only slightly, an issue for these clients.

There may be behavioural problems, in which case help, supervision, or direction is required from time to time. There may also be psychiatric problems, whether active or passive in nature.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Living with very intensive guidance and very intensive care

The clients are visually impaired and have multiple very serious problems. This can result in both a strong need for guidance in combination with intensive care (group A), as well as intensive guidance in combination with intensive behavioural regulation (group B). Both profiles are distinguished and described in this care weight package.

The clients need carers to help, or to completely take over, with regard to social independence.

Clients often need continuous help, supervision, or direction with regard to their psychosocial/cognitive functions. This can be especially the case with memory and thinking, concentration, perception of the environment and oneself, and the client's sensitivity to stimuli.

Client group A needs complete assistance or takeover with regard to ADLs tasks.

With regard to mobility, client group A often needs carers to take over. In particular, takeover may be necessary with regard to spatial orientation, movement, making transfers, and moving indoors and outdoors. There may also be a regular need for help, supervision, or guidance with regard to motor skills.

Client group B can often perform ADLs tasks themselves, but may require supervision or stimulation.

With regard to mobility, client group B is largely self-reliant, although some supervision or stimulation may be necessary at times.

In client group A, some clients may require nursing attention. In client group B, nursing attention is not, or only to a limited extent, relevant.

Client group A can sometimes experience behavioural problems, especially in the form of compulsive behaviour and/or reactive behaviour with regard to interaction.

Client group B often has behavioural problems that can be related to addiction behaviour. This can manifest itself in particular in verbally aggressive behaviour, manipulative behaviour, and/or compulsive behaviour. There is a regular need for help, supervision, or direction.

Psychiatric problems can occur with these clients, and can be both passive and active in nature. Active psychiatric problems mainly occur in client group B.

For client group A, the nature of the guidance objective is primarily aimed at development, but may also concern stabilisation or guidance in the event of deterioration. Sometimes there is counselling in the terminal phase.

In client group B, the nature of the guidance goal is usually aimed at stabilisation or development. This is reflected in the regulation of behavioural problems and the provision of structure and security.

The clients have a structural care need at both planned and unplanned times.

The dominant basis for this client profile is usually a sensory disability (functional disorder).

Intellectual disability

Two care sectors, 'mentally handicapped sector' and 'slightly mentally handicapped sector', correspond with the foundation of care 'intellectual disability'. The relevant care profiles mapped to the relevant care weight packages are listed in Table 65 and Table 66, followed by a description of each profile.[103]

Mentally handicapped sector

Table 65 Mentally handicapped sector care profiles

Mentally handicapped sector	Care weight package
Living with guidance and care	3VG
Living with guidance and intensive care	4VG
Living with intensive guidance and intensive care	5VG
Living with intensive guidance, care, and behavioural regulation	6VG
(Private) living with very intensive guidance, care, and behavioural regulation	7VG
Living with guidance and full care and nursing	8VG

Living with guidance and care

The adult clients have limited independent social functioning. Clients are offered a safe and secure living and working environment. Their sense of time is limited. Support is aimed at stimulating self-reliance when performing tasks and in directing one's own life. Guidance is aimed at participating in social life, if possible.

Clients generally need help with regard to self-reliance. In the areas of written communication and in decision-making and problem-solving skills, carer takeover is sometimes also required. Takeover is almost always necessary when performing more complex tasks.

With regard to psychosocial/cognitive functions, clients occasionally or often require help, supervision, or direction. Spatial and personal orientation is limited to the surrounding area and people known to the client. Help is often needed in particular with regard to concentration, memory and thinking, and psychosocial well-being.

With regard to ADLs, clients regularly need supervision and stimulation. Clients may require some help at times with small grooming tasks; personal care for teeth, hair, nails, and skin; and washing.

Generally, no help is required with regard to mobility. The client can orientate themselves in a fixed, familiar environment. There may be a need for supervision or stimulation when moving outdoors.

These clients usually do not require nursing care.

These clients have little or no behavioural or psychiatric problems.

The nature of the guidance objective is usually aimed at stabilisation or development.

The dominant basis for this client profile is usually a mental disability (functional disorder).

Living with guidance and intensive care

The clients have very limited independent social functioning due to a mental disability (functional disorder). An important goal of the guidance is to provide a safe and familiar living and working environment. Participation in social life is only possible with supervision.

Clients often need carers to help or to take over with regard to social self-reliance. Clients are unable to perform more complex tasks themselves. The same goes for household life, taking care of their daily routine, and making decisions and solving problems. Support is aimed at stimulation and development, as well as at maintaining self-reliance in the performance of tasks and directing one's own life.

Clients often need help, supervision, or direction with regard to psychosocial/cognitive functions. Spatial and personal orientation is limited to the environment and people known to the client. Their sense of time is very limited.

Supervision or assistance is generally required with ADLs. It is often necessary for carers to take over performing small grooming tasks. This concerns caring for teeth, hair, nails, and skin. With regard to eating and drinking, supervision and stimulation is usually sufficient.

In terms of mobility, some assistance may be required, especially when moving outdoors. With regard to spatial orientation and fine motor skills, supervision and stimulation are necessary.

These clients usually do not require nursing care.

These clients have little or no behavioural or psychiatric problems.

The nature of the guidance objective is aimed at stabilisation or prevention of deterioration, and, where possible, at development. This is expressed, for example, in guidance in the areas of well-being and/or participation in social life.

The dominant basis for this client profile is usually a mental disability (functional disorder).

Living with intensive guidance and intensive care

The clients do not function socially independently and are in constant need of guidance because of a mental handicap (functional disorder). Participation in social life is only possible with individual guidance. The guidance has a structure-imparting character, with a clear daily schedule, fixed rules of life, and strict agreements. In addition, attention is paid to developing social and practical skills.

In terms of social self-reliance, clients need to be empowered to maintain social relationships, participate in social life, perform tasks, and manage their daily routine. Help is needed with regard to communication.

Clients often need help, supervision, or direction with regard to psychosocial/cognitive functions. There is targeted guidance with the aim of obtaining a permanent home base that offers safety and security.

With regard to ADLs, clients need help, and carer takeover is regularly required. Guidance focuses on maintaining the client's capabilities. Help and stimulation is often sufficient when eating and drinking.

In the area of mobility, help may be needed, especially when moving outdoors. Care is required for orientation in space, time, and place, as well as with personal orientation.

These clients may have specific nursing requirements in connection with various conditions.

These clients may have minor behavioural or psychiatric problems. Specific guidance is required for this. The guidance focuses mainly on the prevention of compulsive or manipulative behaviour.

The nature of the guidance objective is often aimed at stabilisation or prevention of deterioration, and, where possible, at development.

The dominant basis for this client profile is usually a mental disability (functional disorder).

Living with intensive guidance, care, and behavioural regulation

The clients function independently to a (very) limited extent and require intensive supervision, due to a mental disability (functional disorder) combined with behavioural and/or psychiatric problems. Guidance is often individual and provides structure that is aimed at regulating behavioural problems and providing safety. Limits are set by others. There is a predictable daily routine and fixed rules of life. Safety risks for the supervisors are limited.

In the field of social self-reliance, clients need carers to help or take over with most aspects.

Clients often need help, supervision, or direction with regard to psychosocial/cognitive functions. Particularly in the areas of concentration, memory, and thinking, there may even be a need for continuous help, supervision, or direction.

The client can often perform ADLs themselves, but someone else must supervise, stimulate, or sometimes help.

With regard to mobility, usually no help is needed, but sometimes supervision and stimulation is required when moving outside.

These clients usually do not require nursing care.

There are structural, often cumulative behavioural problems. As a result, clients often or continuously have a need for help, supervision, or direction.

Psychiatric problems regularly occur with these clients. These can be active, as well as passive or variable, in nature.

The nature of the guidance objective is usually aimed at stabilisation or development.

The dominant basis for this client profile is usually a mental disability (functional disorder).

(Private) living with very intensive guidance, care, and behavioural regulation

Clients have major behavioural disorders, as well as mild or severe mental disabilities.

Both client groups function socially with limited or hardly any independence, and require intensive supervision due to a mental disability (functional disorder) combined with behavioural and/or psychiatric problems. Clients permanently need structure, security, and protection. Supervision is often individual and provides structure, with an emphasis on a predictable daily routine and fixed rules of life. For the SGLVG target group, guidance is characterised more by the provision of help, in contrast to the SGEVG target group, where the emphasis is more on taking over tasks and, in particular, ADLs care is more emphatically present. The time commitment for these two groups is the same, which demonstrates that monitoring and helping the SGLVG target group is more time-consuming than taking over tasks.

There is risky behaviour and problematic social behaviour, and these clients are often not motivated to seek treatment themselves. Due to safety risks, several supervisors are usually present at the same time.

With regard to social self-reliance, clients need carers to help with or take over tasks, partly because of a combination of profound problems (i.e. a mental disability combined with physical and/or sensory disabilities and/or psychogeriatric problems). Participation in social life is only possible with individual guidance.

With regard to psychosocial/cognitive functions, clients often require continuous help, supervision, or direction. With regard to concentration, memory, and thinking in particular, clients may have a need for continuous help, supervision, or direction.

Clients in the SGLVG target group can often perform ADLs themselves, but often do need supervision and stimulation. With regard to mobility, no assistance is generally required, but sometimes supervision and stimulation is required when moving outside.

Clients in the SGEVG target group do need regular help with regard to ADLs, especially with small grooming tasks; personal care for teeth, hair, nails, and their home; washing; and eating and drinking. It is possible that two carers/supervisors are needed. Clients may also need assistance with regard to mobility. This can vary in intensity. Help is needed in particular with spatial orientation and moving outside. Clients may be dependent on an electric wheelchair, complicated transfers, environmental controls, and aids due to physical problems. There may be a need for nursing attention.

These clients have various forms of extreme behavioural problems. These can be expressed in many ways – for example, verbal or physical aggression, and destructive, manipulative, compulsive, uncontrolled, or reactive behaviour. There is a continuous need for help, supervision, or direction. Self-harming or self-injurious behaviour is also expected. Correcting problematic behaviour is very difficult because clients are difficult or impossible to influence (with conventional means). Clients have little or no insight into their own contribution to interpersonal problems, and a very limited learning capacity. They can frequently react violently and unpredictably.

A characteristic of these target groups is that there is usually a CEP score of 3 or higher and the presence of a Special Care Plan CCE. Psychiatric problems regularly occur with these clients. These can be active, passive, or variable in nature.

The nature of the guidance objective is usually aimed at stabilisation or development. This is reflected in the regulation of behavioural problems and the provision of structure and security.

Clients have a permanent need for constant supervision.

The dominant basis for this client profile is usually a mental disability (functional disorder).

Living with guidance and full care and nursing

Clients have multiple disabilities; they do not function socially independently and are in constant need of guidance because of a mental handicap (functional disorder). Clients also have physical limitations that require full care and sometimes nursing. Participation in social life is only possible with individual guidance. The guidance provides structure, with a clear daily schedule.

As far as social self-reliance is concerned, it is necessary to take over care. This relates to maintaining social relationships, participation in social life, communication, performing tasks, and arranging a daily routine. Clients are unable to perform tasks independently, partly because of a combination of profound problems (i.e. a mental handicap that is accompanied by physical handicaps).

With regard to psychosocial/cognitive functions, takeover (and sometimes help) is needed. There is targeted guidance with the aim of obtaining a permanent home base that offers safety and security.

With regard to ADLs, it is necessary for carers to take over care. For some clients, the deployment of two carers/counsellors is required to provide the care.

With regard to mobility, takeover is necessary, as these clients are not mobile. Both indoors and outdoors, clients are completely dependent on an (electric) wheelchair, environmental control, and aids. When making transfers, it is necessary to take over care (with aids). Care is required for orientation.

These clients regularly have specific nursing requirements in connection with various conditions.

These clients have little or no behavioural or psychiatric problems.

Clients have a permanent need for:

- Continuous surveillance, or
- 24/7 care in the vicinity.

The dominant basis for this client profile is usually a mental disability (functional disorder).

Slightly mentally handicapped sector

Table 66 Slightly mentally handicapped sector care profiles

Slightly mentally handicapped sector	Care weight package
LVG Living with some treatment and guidance (18–23 years)	1LVG
LVG Living with treatment and guidance (18–23 years)	2LVG
LVG Living with intensive treatment and supervision, small group (18–23 years)	3LVG
LVG Living with very intensive treatment and supervision (18–23 years)	4LVG
LVG Private living with very intensive treatment and supervision (18–23 years)	5LVG
LVG Treatment in an SGLVG treatment centre	1SGLVG

Living with some treatment and guidance (18–23 years)

The clients stay for a defined period in an environment where housing, domestic support, and guidance are offered, with a focus on treatment. There is a clearly defined treatment climate. Clients are treated on the basis of a personalised treatment plan. They are prepared to live as independently as possible. The institution maintains contact with the parents/home situation, and possibly with the client's school and with other external stakeholders, such as social workers.

With regard to social self-reliance, clients need supervision and stimulation. Clients need help with complex tasks, and with decision-making and problem-solving skills.

Clients occasionally need help, supervision, or guidance with regard to psychosocial/cognitive functioning. Help, supervision, or direction may be needed more often in the areas of memory and thinking, concentration, and psychosocial well-being.

The client can perform ADLs themselves; at the most, supervision and stimulation may be necessary.

There are generally no restrictions with regard to mobility.

Usually there is no need for nursing care.

There are behavioural problems, although the client has entered a phase in which the behavioural problem has become manageable. With regard to behavioural problems, some direction, regulation, and supervision is required, especially in the case of manipulative behaviour or reactive behaviour with regard to interaction.

There may be psychiatric problems.

The nature of the guidance objective is aimed at regulating behavioural problems, development, and, where possible, socialisation.

The client has a structural care need at both planned and unplanned times, and is cognitively able to wait for the carer to arrive without immediate problems arising.

The profile usually applies to a client who, according to their practitioner, is dependent on completing residential treatment commenced under the Youth Act.

The dominant basis for this client profile is usually a mental disability (functional disorder) with the specification that their limited social ability, in combination with a mild intellectual disability, makes integrated treatment necessary.

Living with treatment and guidance (18–23 years)

The clients stay for a defined period in an environment where housing, domestic support, and guidance are offered, with a focus on treatment. There is a clearly defined treatment climate, which can extend to all living conditions. Clients are treated on the basis of a personalised treatment plan that focuses on learning social skills, teaching practical skills, improving leisure activities, developing and learning emotional skills, strengthening motor development, strengthening autonomy, improving the social network, and sexual education. The institution maintains regular contact with the parents/home situation, and possibly with the client's school and with other external stakeholders, such as social workers.

With regard to social self-reliance, clients often need carers to help and sometimes take over, as they are often unable to perform tasks themselves. This mainly involves performing more complex tasks, arranging the daily routine, and performing tasks that require decision-making and problem-solving skills.

With regard to psychosocial/cognitive functioning, clients need help, supervision, or direction occasionally to often.

In principle, the client can perform ADLs themselves, but there is a need for regular supervision and stimulation, especially with regard to minor grooming tasks; personal care for teeth, hair, nails, and skin; washing; and eating and drinking.

There are generally no restrictions with regard to mobility.

Usually there is no need for nursing care.

There are behavioural problems. The client needs a lot of direction, regulation, and supervision, particularly in terms of managing verbal aggression, manipulative behaviour, uncontrolled or disinhibited behaviour, and reactive behaviour with regard to interaction.

Additional psychiatric problems occur regularly.

The nature of the guidance objective is aimed at regulating behavioural problems, development, and, where possible, socialisation.

The client has a structural care need at both planned and unplanned times.

The profile is generally applicable to clients for whom the clinician has indicated that this integrated treatment process, which started under the Youth Act, has not yet been completed by the time the client is 18 years old.

The dominant basis for this client profile is usually a mental disability (functional disorder) with the specification that their limited social ability, in combination with a mild intellectual disability, makes integrated treatment necessary.

Living with intensive treatment and supervision, small group (18–23 years)

The clients stay for a defined period in an environment where housing, domestic support, and guidance are offered, with a focus on treatment. There is a clearly defined treatment climate that extends to all spheres of life. Clients are treated according to a personalised treatment plan that focuses on learning social skills, teaching practical skills, improving leisure activities, developing and teaching emotional skills, strengthening motor development, strengthening autonomy, improving the social network, and sexual education. Due to specific problems, staying within a small, well-organised group and intensive involvement is required.

Clients need a lot of help in the area of social self-reliance. They often have great difficulty performing tasks themselves and need a lot of help from carers, or even require carers to take over.

Clients often also need help, supervision, or guidance with regard to psychosocial/cognitive functioning.

In principle, the client can perform ADLs themselves, but a lot of supervision and stimulation is needed with regard to almost all aspects.

There are generally no restrictions with regard to mobility.

Usually there is no need for nursing care.

There are serious behavioural problems. The client needs continuous direction, regulation, treatment, support, and supervision. In particular, behavioural problems include verbal aggression, manipulative behaviour, uncontrolled or disinhibited behaviour, reactive behaviour related to interaction, self-injurious or self-harming behaviour, and anxiety.

Additional psychiatric problems occur regularly.

The nature of the guidance objective is aimed at regulating behavioural problems, development, and, where possible, socialisation.

The client has a structural care need at both planned and unplanned times.

The profile applies, among other things, to clients for whom the practitioner has indicated that this integrated treatment process, started under the Youth Act, has not yet been completed by the time the client is 18 years old.

The dominant basis for this client profile is usually a mental disability (functional disorder) with the specification that their limited social ability and serious behavioural problems, in combination with a mild intellectual disability, make integrated treatment necessary.

Living with very intensive treatment and supervision (18–23 years)

The clients stay for a defined period in an environment where all spheres of life – namely living, school, and/or daytime activities and leisure time – are geared towards each other and where the facility provides support in the other spheres of life. Household support is also provided. There is a clearly defined treatment climate in which permanent protection is possible, and room for movement can be limited for some time. The client is treated according to a personalised treatment plan that focuses on learning social skills, teaching practical skills, improving leisure activities, developing and teaching emotional skills, strengthening motor development, reinforcing autonomy, improving the social network, and sexual education. Due to specific problems, staying within a small, well-organised group and intensive involvement is required. The institution maintains regular contact with the parents/home situation and with other external stakeholders such as social workers.

Help is often needed with regard to social self-reliance. Particularly when entering into social relationships, participating in social life, arranging the daily routine, and performing more complex tasks, continuous help or takeover is often required. Clients often need help, supervision, or guidance with regard to psychosocial/cognitive functioning.

When performing ADLs, the client needs continuous supervision and stimulation and sometimes (partial) takeover, especially with minor grooming tasks and washing. Supervision is also necessary with regard to ensuring that the client consumes sufficient amounts of healthy food and drink. There are generally no restrictions with regard to mobility.

Usually there is no need for nursing care.

There are very serious behavioural problems. The client needs continuous direction, regulation, treatment, support, and supervision. Specifically, behavioural problems include verbal aggression, destructive behaviour, manipulative behaviour, uncontrolled or disinhibited behaviour, reactive behaviour related to interaction, and self-injurious or self-harming behaviour. Transgressive sexual behaviour can also occur. The client has a strong tendency to withdraw from guidance and/or to pose a danger to themselves or their environment.

Additional psychiatric problems occur regularly.

The nature of the counselling objective is aimed at regulating behavioural problems, development, and, where possible, socialisation.

The client has a structural care need at both planned and unplanned times.

The profile applies, among other things, to young adult clients for whom the practitioner has indicated that this integrated treatment process, started under the Youth Act, has not yet been completed by the time the client is 18 years old.

The dominant basis for this client profile is usually a mental disability (functional disorder) with the specification that their limited social ability and serious behavioural problems, in connection with a mild intellectual disability, make integrated treatment necessary.

Private living with very intensive treatment and supervision (18–23 years)

The clients stay for a defined period in a closed environment, where all spheres of life – namely housing, school, and/or daytime activities and leisure time – are geared towards each other and where the facility provides support in the other spheres of life. There is a clearly defined treatment climate in which permanent security is present. The client is treated according to a personalised treatment plan that focuses on learning social skills, teaching practical skills, improving leisure activities, developing and teaching emotional skills, strengthening motor development, reinforcing autonomy, improving the social network, and sexual education. Due to specific problems, staying within a small, well-organised group and intensive involvement is required in a closed environment. A physically protective environment is partly necessary due to the constant threat of conflicts with the environment. The institution maintains regular contact with the parents/home situation and with other external stakeholders such as social workers.

Clients almost always need carers to help or to take over with regard to social life. Clients often need help, supervision, or guidance with regard to psychosocial/cognitive functioning.

In performing ADLs, the client needs continuous supervision, stimulation, and sometimes assistance, especially with minor grooming tasks and washing. Supervision is also necessary with regard to ensuring that the client consumes sufficient amounts of healthy food and drink.

There are generally no restrictions with regard to mobility. When moving outdoors and in terms of orientation, supervision and stimulation may be required.

Usually there is no need for nursing care.

There are very serious behavioural problems. In particular, behavioural problems include verbal aggression, destructive behaviour, manipulative behaviour, uncontrolled or disinhibited behaviour, and reactive behaviour with regard to interaction. Transgressive sexual behaviour can also occur. The client needs continuous direction, regulation, treatment, support, and supervision.

The degree of supervision is very intensive. The living room door is closed. Stays outside the enclosed space are limited, and if this does take place, the client does not go outside without direct supervision.

Additional psychiatric problems occur regularly.

The nature of the guidance objective is aimed at regulating behavioural problems, development, and, where possible, socialisation.

The client has a structural care need at both planned and unplanned times.

The profile applies, among other things, to clients for whom the practitioner has indicated that this integrated treatment process, started under the Youth Act, has not yet been completed by the time the client is 18 years old.

The dominant basis for this client profile is usually a mental disability (functional disorder), with the specification that their limited social self-reliance and serious behavioural problems, in connection with a mild intellectual disability, make integrated treatment necessary.

Treatment in an SGLVG treatment centre

Adult clients' stay in an SGLVG treatment centre is characterised by a 'three-spheres-of-life' situation (an integrated offer of housing, school/work, and leisure) and a therapeutic environment. The guidance and treatment is multidisciplinary and integrated: all those involved work according to the client's treatment plan. Daily counselling includes research and observation of the daily situation, individual counselling discussions/therapies, and practical training during the treatment phase.

With regard to social self-reliance; establishing and maintaining relationships and contacts, as well as participation in social life; limiting danger; and the daily routine, clients need carers to provide continuous help or to take over. Clients have difficulty making independent decisions, assessing the consequences of decisions, and solving problems. Clients can partially initiate and carry out simple

tasks themselves, but this requires supervision and stimulation, and sometimes the carer partially taking over. Regarding the daily routine, adding structure to the daily schedule and household life also requires supervision, stimulation, and partial takeover.

With regard to psychosocial/cognitive functions, clients need continuous help, supervision, or direction.

In principle, clients can carry out the various aspects of ADLs themselves, but they do need supervision and stimulation or sometimes help with this.

Clients generally have no restrictions with regard to mobility. When moving outdoors and with regard to orientation, supervision or stimulation is often required.

Usually there is no need for nursing care.

There are serious, complex behavioural problems. The client needs continuous supervision, direction, or assistance in this regard.

There are often psychiatric problems, which in many cases are active in nature.

The nature of the guidance objective is aimed at stabilisation and development.

The dominant basis for this client profile is usually a mental disability (functional disorder) with the specification that their limited social ability and serious behavioural problems, in connection with a mild intellectual disability, make integrated treatment necessary.

Psychological disorder

Two care sectors, 'mental health sector, group B ' and 'mental health sector, housing ', correspond to the foundation of care 'psychological disorder'. The relevant care profiles, mapped to the relevant care weight packages, are listed in Table 67 and Table 68, followed by a description of each profile. .[103]

Mental health sector, group B

Table 67 Mental health sector, group B are profiles

Mental health sector, group B	Care weight package
Continued stay with intensive supervision	3b GGZ
Continued stay with intensive guidance and care	4b GGZ
Continued stay with intensive guidance and behavioural regulation	5b GGZ
Continued stay with intensive supervision and intensive nursing and care	6b GGZ
Secure continued residence due to extreme behavioural problems with very intensive supervision	7b GGZ

Continued stay with intensive supervision

Due to a psychiatric disorder, this client group requires some form of treatment (medical care) that necessitates a stay in an institution. In addition, intensive guidance is needed, which is constantly nearby. Clients need a safe, low-demand, and low-stimulus residential environment that offers protection, stability, and structure. The practitioner is fully responsible for the treatment plan and stay. .[103]

Clients need intensive daily support with regard to their social self-reliance. There is a loss of self-direction and a disrupted circadian rhythm. Clients have major problems maintaining social relationships. Clients are almost unable to participate in social life and often not interested in it. In addition, there are significant limitations in decision-making and problem-solving skills and in initiating and performing both simple and more complex tasks. Clients generally need guidance in managing money and performing administrative tasks. They usually travel with guidance.

Clients generally require intensive support with regard to all cognitive/psychological functions.

The nature of the treatment/counselling goal can be development-oriented, such that return home or placement in a protective living environment is possible. The treatment is mainly aimed at restoring personal functioning. However, there is also a group of clients that can be regarded as chronic. For this group, stabilisation and continuation of the situation is the starting point of treatment. There may also be counselling in case of deterioration. This group will continue to require permanent treatment in order to prevent further/new relapses.

In terms of ADLs, clients generally need supervision or stimulation with regard to personal care.

Clients generally do not need any help with regard to mobility.

These clients may have some recurring behavioural problems, but these are manageable in the context of continuous counselling. This is especially the case with reactive behaviour with regard to interaction.

The psychiatric problems of these clients vary from passive to active. The psychiatric symptoms are at times difficult to control; in such cases, intensification of care (or adjustment of medication) is desirable.

The profile applies to adult clients for whom the GGZ practitioner has indicated that this treatment process, started under the Health Insurance Act, has not been completed after 3 years.

Continued stay with intensive guidance and care

Due to a serious psychiatric disorder, this client group requires some form of treatment (medical care) that necessitates a stay in an institution. In addition, intensive guidance plus care is required due to (somatic) health problems. Clients need a structured and supervised protective residential environment. The practitioner is fully responsible for the treatment plan and stay.

Clients need intensive daily support with regard to their social self-reliance. There is loss of self-direction and a disrupted circadian rhythm. Clients have major problems maintaining social relationships. Clients are unable to participate in social life. In addition, there are significant limitations in decision-making and problem-solving skills and in initiating and performing both simple and more complex tasks. Clients generally need guidance in managing money and performing administrative tasks. They usually travel with guidance.

Clients generally require intensive support with regard to all cognitive/psychological functions.

The nature of the treatment/counselling goal can be development-oriented, such that return home or placement in a protective living environment is possible. However, there is also a group of clients that can be regarded as chronic. For this group, stabilisation and continuation of the situation is the starting point of treatment. This group will continue to require permanent treatment in order to prevent further/new relapses.

With regard to ADLs, clients often have a daily need for help with personal care because of health problems (for example, as a result of problems related to ageing or neglect of health due to roaming the streets).

Clients generally do not need any help with regard to mobility.

These clients have behavioural problems. The treatment is partly aimed at keeping these behavioural problems manageable and dealing with breakdowns.

Psychiatric problems in these clients are generally active in nature.

The profile applies to adult clients for whom the GGZ practitioner has indicated that this treatment process, started under the Health Insurance Act, has not been completed after 3 years.

Continued stay with intensive guidance and behavioural regulation

Due to a serious psychiatric disorder, this client group requires intensive treatment (medical care) that necessitates a stay in an institution. In addition, intensive guidance and structuring is required.

The residential environment must offer structure, safety, and protection. The practitioner is fully responsible for the treatment plan and stay.

With regard to their social self-reliance, the clients require intensive daily support that is constantly nearby, as well as a highly structured daily schedule. Clients are hardly able to maintain social relationships. Clients do not have the ability or interest necessary to participate in social life. In addition, decision-making and problem-solving skills are lacking, and the initiation and execution of both simple and more complex tasks often has to be taken over. Clients need guidance in managing money and performing administrative tasks. They travel with guidance.

Clients need intensive support with regard to all cognitive/psychological functions.

The nature of the treatment/counselling goal can be development-oriented, such that return home or placement in a protective living environment is possible. However, there is also a group of clients that can be regarded as chronic. For this group, stabilisation and continuation of the situation is the starting point of treatment. This group will continue to require permanent treatment in order to prevent further/new relapses.

With regard to ADLs, clients need supervision and stimulation and/or assistance with the various aspects of performing these tasks. There may be somatic problems as a result of self-neglect that require extra attention.

Clients generally do not need any help with regard to mobility.

These clients have serious behavioural problems that must be regulated continuously. These clients make great demands on their social environment and put it under constant pressure with manipulative behaviour. They have limited sensitivity to correction, little insight into their own contribution to interaction problems, and a relatively limited learning capacity. There is verbally aggressive behaviour, manipulative behaviour, compulsive behaviour, destructive behaviour, and reactive behaviour in relation to interaction. There may be self-harming or self-injurious behaviour.

Psychiatric problems are generally active in these clients. The psychiatric symptoms are difficult to control. There is regular intensification of the treatment, and supervision and regular adjustment of the medication is necessary.

The profile applies to adult clients for whom the GGZ practitioner has indicated that this treatment process, started under the Health Insurance Act, has not been completed after 3 years.

Continued stay with intensive supervision and intensive nursing and care

Due to a serious psychiatric condition, this client group requires intensive treatment (medical care) that necessitates a stay in an institution. In addition, in the case of a comorbid medical condition, physical disability, or mental disability, intensive guidance and care is required. The residential environment must offer structure, safety, and protection, and must be adapted to the limitations of the clients (e.g. in order to facilitate wheelchair use). The practitioner is fully responsible for the treatment plan and stay.

With regard to their social self-reliance, the clients require intensive daily support that is constantly nearby, as well as a highly structured daily schedule. Clients are hardly able to maintain social relationships. Clients have neither the ability nor the interest necessary to participate in social life. In addition, decision-making and problem-solving skills are lacking, and the initiation and execution of both simple and more complex tasks often has to be taken over. Clients need guidance in managing money and performing administrative tasks. They travel with guidance.

Clients need intensive support with regard to all cognitive/psychological functions.

The nature of the treatment/counselling goal can be development-oriented, such that return home or placement in a protective living environment is possible. However, there is also a group of clients that can be regarded as chronic. For this group, stabilisation and continuation of the situation or guidance in the event of deterioration is the starting point of treatment. This group will continue to require permanent treatment in order to prevent or limit further/new relapses.

With regard to ADLs, there is an extensive need for assistance, including with eating and drinking, washing and dressing, and going to the toilet. The client is almost completely dependent on care in this area. These clients also often require nursing care as a result of physical health problems.

With regard to mobility, assistance is required with regard to making transfers (e.g. in and out of bed; in and out of a wheelchair).

These clients have behavioural problems. The treatment is also aimed at keeping these behavioural problems manageable.

Psychiatric problems are generally active in these clients . The psychiatric symptoms are difficult to control. There is regular intensification of the treatment, and supervision and regular adjustment of the medication is necessary. The treatment is aimed at both the psychiatric problem and the additional problem(s) present.

The profile applies to adult clients for whom the GGZ practitioner has indicated that this treatment process, started under the Health Insurance Act, has not been completed after 3 years.

Secure continued residence due to extreme behavioural problems with very intensive supervision

Due to a very serious psychiatric disorder, this client group requires very intensive treatment (medical care) that necessitates a stay in an institution. In addition, very intensive guidance is required, along with intensive care, an exceptionally structured environment, and a high degree of security and protection. The residential environment must be geared to this. A specific architectural setting and level of security is required. The practitioner is fully responsible for the treatment plan and stay.

With regard to their social self-reliance, these clients require very intensive daily support that is constantly nearby, as well as an exceptionally highly structured daily schedule. Clients are unable to maintain social relationships. Due to the extreme behavioural problems, participation in social life is not an issue. Furthermore, all decision-making and problem-solving skills are lacking, and the initiation and execution of both simple and more complex tasks must be completely taken over.

Clients need intensive support with regard to all cognitive/psychological functions.

The nature of the treatment/counselling goal can be development-oriented, such that return home or placement in a protective living environment is possible. However, there is also a group of clients that can be regarded as chronic. For this group, stabilisation and continuation of the situation is the starting point of treatment. This group will require permanent treatment in order to prevent further/new relapses.

With regard to ADLs, these clients need some help regarding the various aspects of these tasks. Regular to frequent nursing action is required for these clients (medication and health protection).

Clients need limited assistance with regard to mobility. For safety reasons, these clients cannot move independently outside.

These clients have various forms of extreme behavioural problems. This includes verbally aggressive, physically aggressive, destructive, manipulative, compulsive, uncontrolled, and reactive behaviour. There is a continuous need for help, supervision, or direction. Self-injurious or self-harming behaviour is also expected. Clients make great demands on their social environment and put it under constant pressure. They are insensitive to correction, have no insight into their own contribution to interaction problems, and have very limited learning capacity. They can frequently react unpredictably or violently.

Psychiatric problems are generally active in these clients. The psychiatric symptoms are difficult to control. There is regular intensification of the treatment, and supervision and regular adjustment of the medication is necessary.

The profile applies to adult clients for whom the GGZ practitioner has indicated that this treatment process, started under the Health Insurance Act, has not been completed after 3 years.

Mental health sector, housing

Table 68 Mental health sector, housing care profiles

Mental health sector, housing	Care weight package
GGZ Living with intensive guidance	1 GGZ
GGZ Living with intensive guidance and care	2 GGZ
GGZ Living with intensive guidance and behavioural regulation	3 GGZ
GGZ Living with intensive supervision and intensive nursing and care	4 GGZ
GGZ Protected living due to extreme behavioural problems with very intensive supervision	5 GGZ

Living with intensive guidance

This client group requires intensive support due to a psychiatric condition. They are unable to independently manage a household, do not have the potential (the ability and willingness) to live independently, cannot postpone and/or articulate their request for help, and/or are unable to request help in time. There is limited problem-solving capacity, impulsive decision-making and reactions, and problems with impulse control. .[103]

The client's skill level is limited. Clients cannot perform simple tasks that they face in daily life without supervision. Clients need a safe, low-demand, and low-stimulus living environment that offers protection, stability, security, and structure. The counselling, psychiatric nursing, and/or treatment is therefore mainly aimed at dealing with the issues and the vulnerability as a result thereof, and at supporting and/or treating clients in order to convert the problem behaviour into constructive or functional behaviour.

The psychiatric problems of these clients vary from passive to active. The psychiatric symptoms are at times difficult to control, so intensification of care (or adjustment of medication) is desirable. Clients themselves have little or no insight into the consequences of the disorder and the effects of their (problem) behaviour.

Social self-reliance

Clients need intensive daily support with regard to their social self-reliance. There is a loss of self-direction and/or a disrupted circadian rhythm. Clients have major problems maintaining social relationships. Outside of professionals, clients have very few relationships that can be supportive, or these relationships are not close by. Clients are almost unable to participate in social life; they do not experience a bond with society. The client does not ask for help in an adequate manner, and does not indicate their own boundaries.

Psychosocial/cognitive functions

There are significant limitations in decision-making and problem-solving skills and in initiating and performing simple tasks. For example, clients need guidance in managing money and/or performing administrative tasks. Clients need guidance in structuring the day and doing repetitive daily activities, such as preparing meals and shopping. Clients generally require intensive support with regard to all cognitive/psychological functions.

ADLs

With regard to ADLs, clients generally need supervision or stimulation with regard to personal care and keeping their personal living environment clean.

Mobility

Clients may have mobility problems earlier than average due to physical damage as a result of lifestyle and/or due to damage caused by their disorder and/or the medication they take. They often use aids at a relatively young age because of somatic disorders.

Behavioural problems

These clients may have some recurring behavioural problems, but this is manageable in the context of continuous guidance in the facility. This is especially the case with reactive behaviour with regard to interaction.

Nature of the supervision/treatment objective

The nature of the counselling/treatment goal is learning to deal with or guide the vulnerability and how to manage the effects of the clients' behaviour. The focus is on stabilisation and retention of skills and is development-oriented. However, there can also be counselling for deterioration and the prevention of instability in areas of life such as housing, finances, and social relationships.

Basis

Clients in this care profile have a psychiatric disorder or psychological disorder (which also includes addiction), possibly in combination with a (mild) intellectual disability and/or a mild general medical condition.

Living with intensive guidance and care

Care profile

This client group requires intensive support due to a psychiatric condition. They cannot postpone and/or articulate their request for help and/or are unable to request help in time. Clients need a protective living environment that provides structure and supervision, which can be partially closed in nature (i.e. controlled entrance and exit). Support for tasks is needed in all areas of life, including help due to (somatic) health limitations.

The psychiatric problems of these clients vary from passive to active, and/or there is active substance addiction. An attempt is made to keep the problem under control with medications and counselling, psychiatric nursing, and/or treatment aimed at the client's behaviour, to support and/or treat clients in order to convert the problem behaviour into constructive or functional behaviour. If applicable, there is a controlled use of resources.

Social self-reliance

Clients need intensive daily support with regard to their social self-reliance. There is a loss of self-direction and a disrupted circadian rhythm. Clients have major problems maintaining social relationships. Outside of professionals, clients have very few relationships that can be supportive, or these relationships are not close by. Clients are unable to participate in social life, as they do not experience a bond with society. The client does not ask for help in an adequate manner, and does not indicate their own boundaries.

Psychosocial/cognitive functions

There are significant limitations in decision-making and problem-solving skills and in initiating and performing simple tasks. Clients need guidance in managing money and performing administrative tasks. Daily repetitive actions are organised for the client, and the client can perform tasks under supervision. Clients generally require intensive support with regard to all cognitive/psychological functions; there may be memory problems.

ADLs

With regard to ADLs, because of general poor health, clients often have a daily need for help with personal care (for example, as a result of problems related to ageing or neglect of health due to roaming the street). Clients cannot independently clean their personal living environment, so they are intensively supervised in this regard.

Mobility

Clients have mobility problems earlier than average due to physical damage as a result of lifestyle and/or due to damage caused by the disorder and/or the medication that they take. They often use medical aids at a relatively young age because of somatic disorders. They can travel unaccompanied on well-known, 'worn-in' routes. For other routes, they travel with guidance.

Behavioural problems

These clients have behavioural problems. The guidance is partly aimed at keeping these behavioural problems manageable and guiding behaviour that occurs as a result of cognitive damage.

Nature of the supervision/treatment objective

The nature of the counselling/treatment goal is development-oriented in learning to deal with or guide the vulnerability and how to handle the effects of the clients' behaviour, or at stabilisation and continuation of the situation aimed at preventing instability in housing, finances, and social relationships.

Basis

Clients in this care profile have a psychiatric disorder or psychological disorder (which also includes addiction), possibly in combination with a general medical disorder or a physical and/or (mild) mental disability.

Living with intensive guidance and behavioural regulation

Care profile

Due to a complex psychiatric condition, this client group requires intensive care and intensive support. They cannot postpone and/or articulate their request for help and/or are unable to request help in time. The living environment must offer a lot of structure, safety, and protection, and can be partially closed in nature (i.e. controlled entrance and exit). Support and takeover of tasks is needed in all areas of life.

Psychiatric problems are active for these clients. An attempt is made to keep the problem under control with medication and intensive counselling, psychiatric nursing, and/or treatment.

Social self-reliance

With regard to their social self-reliance, these clients require intensive daily support that is constantly nearby, as well as a highly structured daily schedule. There is a loss of self-direction and often a disrupted circadian rhythm. Due to a lack of social skills, clients are unable to maintain social relationships. These clients are unable to participate in social life; they do not experience a bond with society. The client does not ask for help in an adequate manner, and does not indicate their own boundaries.

Psychosocial/cognitive functions

These clients lack decision-making and problem-solving skills and often require help with the initiation and execution of both simple and more complex tasks or additional assistance. Clients need guidance in managing money and performing administrative tasks. Clients need intensive support with regard to all cognitive/psychological functions. They often make impulsive decisions, as they have no insight into the consequences of their behaviour.

ADLs

With regard to ADLs, clients need supervision and stimulation and/or assistance with the various aspects of these tasks. There may be somatic problems that require extra attention due to self-neglect. Clients neglect their personal living environment and require intensive guidance.

Mobility

Clients may have mobility problems earlier than average due to physical damage as a result of lifestyle and/or due to damage caused by the disorder and/or the medication they take. They often use aids at a relatively young age because of somatic disorders. They can travel unaccompanied on well-known, 'worn-in' routes. For other routes they travel with guidance.

Behavioural problems

These clients have serious behavioural problems that must be regulated continuously, partly through intensive guidance. These clients make great demands on their environment and put it under constant pressure with problematic behaviour. They have limited sensitivity to correction and are unable to adjust their behaviour after correction, have little insight into their own contribution to interaction problems, and have a relatively limited learning capacity. There is verbally aggressive behaviour, manipulative behaviour, compulsive behaviour, destructive behaviour, and reactive behaviour related to interaction. There may be self-injurious or self-harming behaviour.

Nature of the supervision/treatment objective

The nature of the guidance/treatment objective is stabilisation and continuation of the situation, or is development-oriented (where possible). Clients are coached or taught to deal with their vulnerability and to deal with the effects of their behaviour.

Basis

Clients in this care profile have a psychiatric disorder or psychological disorder (which also includes addiction), possibly in combination with a general medical disorder or a physical and/or (mild) mental disability.

Living with intensive supervision and intensive nursing and care

Care profile

Due to a complex psychiatric condition, in combination with a general medical condition, physical disability, or intellectual disability, this client group requires intensive guidance, nursing, and care. They cannot postpone and/or articulate their request for help and/or are unable to request help in time. The mutual influence of the disorders, conditions, and/or limitations leads to complex care needs. The living environment must offer a lot of predictability, structure, safety, and protection and be adapted to the limitations of the clients (e.g. enable wheelchair use). It is often necessary to take over tasks in all areas of life.

Psychiatric problems are active for these clients. An attempt is made to keep the problem under control with medications and intensive counselling, psychiatric nursing, and/or treatment.

Social self-reliance

With regard to their social self-reliance, these clients require intensive daily support that is constantly nearby, as well as a highly structured daily schedule. There are serious management problems. Clients are unable to maintain social relationships. They are also unable to participate in social life.

Psychosocial/cognitive functions

These clients lack decision-making and problem-solving skills, and carers often have to take over the initiation and execution of almost all tasks. Clients need guidance in managing money and performing administrative tasks. Clients need intensive support with regard to all cognitive/psychological functions.

ADLs

With regard to ADLs, clients have an extensive need for assistance due to poor health, including with eating and drinking, washing, and dressing. They often have a daily need for carers to help them with or take over personal care (for example, as a result of problems related to ageing or neglect of health due to wandering on the street). The somatic complaints are of such a nature that there is often a daily need for intensive nursing and monitoring.

Clients cannot independently clean their personal living environment; they must be guided intensively in this regard.

Mobility

With regard to mobility, clients require mobility aids and support through guidance. They can travel unaccompanied on well-known, 'worn-in' routes. For other routes, they travel with guidance.

Behavioural problems

These clients have serious behavioural problems that must be regulated continuously, partly through intensive guidance.

Nature of the supervision/treatment objective

The nature of the guidance objective is diverse; stabilisation and continuation of the situation, development-oriented treatment (where possible), and guidance in the event of deterioration are all on the agenda.

Basis

Clients in this care profile have a psychiatric disorder or psychological disorder (which also includes addiction), in combination with a general medical disorder or a physical and/or (mild) mental disability.

Protected living due to extreme behavioural problems with very intensive supervision

Care profile

Due to a very serious psychiatric disorder, this client group requires very intensive support, along with intensive care, an exceptionally structured climate, and a high degree of security and protection. The residential environment must be geared to this – for example, a low-stimulus environment. A specific architectural setting and level of security is required with, for example, a controlled entrance and exit. Support and takeover of tasks is needed in all areas of life.

Psychiatric problems are generally active in these clients. The psychiatric symptoms are difficult to control. There is regular intensification of psychiatric nursing, treatment, and support, and regular adjustments of the medication are necessary.

Social self-reliance

With regard to their social self-reliance, these clients require very intensive daily support that is constantly nearby, as well as an exceptionally highly structured daily schedule. There is a loss of self-direction and often a disrupted circadian rhythm. Clients are unable to maintain social relationships. Due to the extreme behavioural problems, participation in social life is not an issue.

Psychosocial/cognitive functions

These clients lack all decision-making and problem-solving skills, and the initiation and execution of both simple and more complex tasks must be completely taken over by carers. Clients need intensive support with regard to all cognitive/psychological functions.

ADLs

With regard to ADLs, these clients need some help regarding the various aspects of these tasks. Regular to frequent nursing care is required for these clients (medication and health protection). Clients neglect their personal living environment and require intensive guidance.

Mobility

Clients need limited assistance with regard to mobility. For safety reasons, they cannot independently move outside.

Behavioural problems

These clients have virtually no impulse control and have various forms of extreme behavioural problems. This includes verbally aggressive, physically aggressive, destructive, manipulative, compulsive, uncontrolled, and reactive behaviour. There is a continuous need for help, supervision, or direction. In addition, self-injurious or self-harming behaviour is also to be expected. Clients make great demands on their social environment and put it under constant pressure. They are insensitive to correction, have no insight into their own contribution to interaction problems, and have very limited learning capacity. They can frequently react unpredictably and violently.

Nature of the supervision/treatment objective

The problems of this group of clients can be regarded as chronic. For this group, stabilisation and continuation of the situation is the starting point of treatment. This group will continue to need permanent supervision and treatment in order to prevent further/new relapses.

Clients in this care profile have a psychiatric disorder or psychological disorder (which also includes addiction), possibly in combination with a general medical disorder or a physical and/or (mild) mental disability.

Appendix D Critical appraisal full explanation

Table 69 Selection bias criteria

Study ID	Are the individuals selected to participate in the study likely to be representative of the target population?	What percentage of selected individuals agreed to participate?	Section rating	Comments
Arling 2002	Very likely	80 - 100% agreement	Good	-
Arling 2007	Somewhat likely	less than 60% agreement	Poor	-
Botz 1993	Very likely	80 - 100% agreement	Good	-
Bowblis 2015	Very likely	80 - 100% agreement	Good	-
Bowblis 2017	Very likely	80 - 100% agreement	Good	-
Boyd 2011	Very likely	60 – 79% agreement	Fair	Varying levels of response - 99% 1988, 85% 1993, 65% 1998, 89% 2008
Cohen 1990	Very likely	80 - 100% agreement	Good	-
Collins 2006	Not likely	less than 60% agreement	Poor	-
Davis 1998	Very likely	80 - 100% agreement	Good	-
Dubuc 2011	Very likely	less than 60% agreement	Poor	45% refusal rate for eligible potential participants

Study ID	Are the individuals selected to participate in the study likely to be representative of the target population?	What percentage of selected individuals agreed to participate?	Section rating	Comments
				(information from Hebert 2010)
Duell 2017	Very likely	80 - 100% agreement	Good	-
Ernst & Young 2019	Very likely	less than 60% agreement	Poor	-
Feng 2006	Very likely	80 - 100% agreement	Good	-
GAO 1990	Somewhat likely	Can't tell	Poor	-
GAO 2002	Very likely	80 - 100% agreement	Good	-
Gargett 2010	Very likely	80 - 100% agreement	Good	-
Grabowski 2002	Very likely	80 - 100% agreement	Good	-
Grabowski 2004	Very likely	80 - 100% agreement	Good	Medical records study, so participants could not opt out
Hebert 2008b	Very likely	less than 60% agreement	Poor	-
Hebert 2010	Very likely	less than 60% agreement	Poor	-
Hollander 2007	Very likely	80 - 100% agreement	Good	Includes all new assessments in the fiscal year in British Columbia
Kenny 1990	Very likely	80 - 100% agreement	Good	-
Konetzka 2006	Very likely	80 - 100% agreement	Good	No opt out option
Latham 2008	Very likely	80 - 100% agreement	Good	-
MedPAC reports	Can't tell	Can't tell	Poor	Little information given about data sources
Mor 2011	Very likely	80 - 100% agreement	Good	-
Nyman 1994	Very likely	80 - 100% agreement	Good	-
Office of the Inspector General and Department of Health and	Somewhat likely	Not applicable	Poor	-

Study ID	Are the individuals selected to participate in the study likely to be representative of the target population?	What percentage of selected individuals agreed to participate?	Section rating	Comments
Human Services 1997				
Office of the Inspector General and Department of Health and Human Services 2015	Very likely	80 - 100% agreement	Good	No opt out option
Schlenker 1991	Somewhat likely	Not applicable	Poor	The facility samples were not intended to represent each state's entire nursing home universe. Rather, stratified random samples were designed to represent the most common types of nursing homes providing care to Medicaid recipients.
Schlenker 2005	Very likely	80 - 100% agreement	Good	-
Schultz 1994	Somewhat likely	80 - 100% agreement	Good	169/650 potential facilities included, no option to opt in or out
Sutherland 2013	Can't tell	Can't tell	Poor	-
Swan 1993	Can't tell	Can't tell	Poor	-
Swan 2003	Very likely	80 - 100% agreement	Good	All facilities included
Tenand 2020a equal	Very likely	80 - 100% agreement	Good	No option to opt out
Tenand 2020b eligibility	Very likely	80 - 100% agreement	Good	No option to opt out
Teno 2008	Very likely	80 - 100% agreement	Good	-
Thorpe 1991	Very likely	80 - 100% agreement	Good	-
Unruh 2006	Very likely	80 - 100% agreement	Good	-
Warren 2020	Somewhat likely	less than 60% agreement	Poor	-

Study ID	Are the individuals selected to participate in the study likely to be representative of the target population?	What percentage of selected individuals agreed to participate?	Section rating	Comments
White 2003	Very likely	80 - 100% agreement	Good	-
White 2005	Very likely	80 - 100% agreement	Good	-
White 2009	Very likely	80 - 100% agreement	Good	20% sample of Medicare home health users
Wodchis 2004	Very likely	80 - 100% agreement	Good	-
Wodchis 2007	Very likely	80 - 100% agreement	Good	-

Table 70 Study design criteria

Study ID	Indicate the study design	Randomized	If Yes, was the method of randomization described?	If Yes, was the method appropriate?	Section rating	Comments
Arling 2002	Other	No	No	No	Poor	-
Arling 2007	Other	No	No	No	Poor	-
Botz 1993	Other	No	No	No	Poor	Comparing data from same group, using different classification systems.
Bowblis 2015	Interrupted time series	No	No	No	Fair	-
Bowblis 2017	Other	No	No	No	Poor	-
Boyd 2011	Other	No	No	No	Poor	-
Cohen 1990	Other	No	No	No	Poor	-
Collins 2006	Other	No	No	No	Poor	-
Davis 1998	Other	No	No	No	Poor	-
Dubuc 2011	Cohort analytic (two group pre + post)	No	No	No	Fair	Quasi-experimental, pretest and multiple post test, comparator group
Duell 2017	Other	No	No	No	Poor	Administrative data

Study ID	Indicate the study design	Randomized	If Yes, was the method of randomization described?	If Yes, was the method appropriate?	Section rating	Comments
Ernst & Young 2019	Other	No	No	No	Poor	-
Feng 2006	Other	No	No	No	Poor	-
GAO 1990	Other	No	No	No	Poor	-
GAO 2002	Other	No	No	No	Poor	-
Gargett 2010	Other	No	No	No	Poor	-
Grabowski 2002	Other	No	No	No	Poor	-
Grabowski 2004	Other	No	No	No	Poor	Surveillance data
Hebert 2008b	Cohort analytic (two group pre + post)	No	No	No	Fair	-
Hebert 2010	Cohort analytic (two group pre + post)	No	No	No	Fair	-
Hollander 2007	Interrupted time series	No	No	No	Fair	-
Kenny 1990	Other	No	No	No	Poor	-
Konetzka 2006	Other	No	No	No	Poor	-
Latham 2008	Other	No	No	No	Poor	-
MedPAC reports	Other	No	No	No	Poor	-
Mor 2011	Other	No	No	No	Poor	-
Nyman 1994	Other	No	No	No	Poor	-
Office of the Inspector General and Department of Health and Human Services 1997	Other	Yes	Yes	Yes	Poor	-
Office of the Inspector General and Department of Health and Human	Other	No	No	No	Poor	-

Study ID	Indicate the study design	Randomized	If Yes, was the method of randomization described?	If Yes, was the method appropriate?	Section rating	Comments
Services 2015						
Schlenker 1991	Other	No	No	No	Poor	-
Schlenker 2005	Other	No	No	No	Poor	-
Schultz 1994	Other	No	No	No	Poor	Surveillance data
Sutherland 2013	Other	No	No	No	Poor	-
Swan 1993	Other	No	No	No	Poor	Surveys
Swan 2003	Other	No	No	No	Poor	
Tenand 2020a equal	Other	No	No	No	Poor	Administrative data
Tenand 2020b eligibility	Other	No	No	No	Poor	Administrative data
Teno 2008	Other	No	No	No	Poor	-
Thorpe 1991	Other	No	No	No	Poor	-
Unruh 2006	Other	No	No	No	Poor	-
Warren 2020	Other	No	No	No	Poor	-
White 2003	Other	No	No	No	Poor	-
White 2005	Other	No	No	No	Poor	-
White 2009	Other	No	No	No	Poor	-
Wodchis 2004	Other	No	No	No	Poor	-
Wodchis 2007	Other	No	No	No	Poor	-

Table 71 Confounders criteria

Study ID	Were there important differences between groups prior to the intervention?	If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	Section rating	Comments
Arling 2002	Yes	60 – 79%	Fair	-

Study ID	Were there important differences between groups prior to the intervention?	If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	Section rating	Comments
Arling 2007	Yes	80 – 100%	Good	Significant regression
Botz 1993	No	Not applicable	Good	Same patients in all groups
Bowblis 2015	Yes	80 – 100%	Good	-
Bowblis 2017	Yes	80 – 100%	Good	-
Boyd 2011	Can't tell	Can't Tell	Poor	-
Cohen 1990	Yes	60 – 79%	Fair	-
Collins 2006	Can't tell	Not applicable	Not applicable	-
Davis 1998	Yes	60 – 79%	Fair	Some high-level regression analyses performed
Dubuc 2011	Yes	80 – 100%	Good	Some variables included in analysis
Duell 2017	Yes	60 – 79%	Fair	-
Ernst & Young 2019	Can't tell	Can't Tell	Poor	-
Feng 2006	Yes	80 – 100%	Good	-
GAO 1990	Can't tell	Can't Tell	Poor	-
GAO 2002	No	Not applicable	Not applicable	-
Gargett 2010	Yes	Less than 60%	Poor	Other factors that may have contributed to effects are mentioned but not accounted for
Grabowski 2002	Yes	60 – 79%	Fair	-
Grabowski 2004	Yes	60 – 79%	Fair	-
Hebert 2008b	Yes	80 – 100%	Good	An analysis of covariance comparing post-test scores was performed, adjusting for baseline scores.
Hebert 2010	Yes	Less than 60%	Poor	-
Hollander 2007	Can't tell	Can't Tell	Poor	
Kenny 1990	Yes	60 – 79%	Fair	-
Konetzka 2006	Can't tell	Can't Tell	Poor	-

Study ID	Were there important differences between groups prior to the intervention?	If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	Section rating	Comments
Latham 2008	Yes	60 – 79%	Fair	-
MedPAC reports	Can't tell	Can't Tell	Poor	-
Mor 2011	Yes	60 – 79%	Fair	-
Nyman 1994	Yes	80 – 100%	Good	Patients are grouped by need
Office of the Inspector General and Department of Health and Human Services 1997	Can't tell	Can't Tell	Poor	-
Office of the Inspector General and Department of Health and Human Services 2015	Yes	80 – 100%	Good	Patients are grouped by need
Schlenker 1991	Yes	80 – 100%	Good	Extensive regression
Schlenker 2005	Yes	80 – 100%	Good	-
Schultz 1994	Can't tell	Can't Tell	Poor	-
Sutherland 2013	Can't tell	Can't Tell	Poor	-
Swan 1993	Can't tell	Can't Tell	Poor	-
Swan 2003	Yes	Less than 60%	Poor	-
Tenand 2020a equal	Yes	80 – 100%	Good	Patients are grouped by need
Tenand 2020b eligibility	Yes	80 – 100%	Good	Patients are grouped by need
Teno 2008	Yes	60 – 79%	Fair	-
Thorpe 1991	Yes	60 – 79%	Fair	-
Unruh 2006	Yes	80 – 100%	Good	-
Warren 2020	No	Not applicable	Not applicable	-
White 2003	Can't tell	Can't Tell	Poor	-
White 2005	Yes	80 – 100%	Good	-
White 2009	Yes	80 – 100%	Good	100s of confounders assessed in regression analyses

Study ID	Were there important differences between groups prior to the intervention?	If yes, indicate the percentage of relevant confounders that were controlled (either in the design (e.g. stratification, matching) or analysis)?	Section rating	Comments
Wodchis 2004	Yes	80 – 100%	Good	-
Wodchis 2007	Yes	80 – 100%	Good	-

Table 72 Blinding criteria

Study ID	Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	Were the study participants aware of the research question?	Section rating	Comments
Arling 2002	Yes	No	Fair	-
Arling 2007	Yes	Yes	Poor	Staff aware
Botz 1993	Yes	No	Fair	-
Bowblis 2015	Yes	No	Fair	-
Bowblis 2017	Yes	No	Fair	-
Boyd 2011	Yes	No	Fair	-
Cohen 1990	Yes	No	Fair	-
Collins 2006	Yes	Yes	Poor	-
Davis 1998	Yes	No	Fair	-
Dubuc 2011	Can't tell	Yes	Poor	-
Duell 2017	Yes	No	Fair	-
Ernst & Young 2019	Can't tell	Can't tell	Poor	-
Feng 2006	Yes	No	Fair	-
GAO 1990	Yes	Can't tell	Poor	-
GAO 2002	Yes	No	Fair	-
Gargett 2010	Yes	No	Fair	-
Grabowski 2002	Yes	No	Fair	-
Grabowski 2004	Yes	No	Fair	-
Hebert 2008b	Can't tell	Yes	Poor	-
Hebert 2010	Can't tell	Yes	Poor	-
Hollander 2007	Yes	No	Fair	-
Kenny 1990	Yes	No	Fair	-
Konetzka 2006	Yes	No	Fair	-
Latham 2008	Yes	No	Fair	-

Study ID	Was (were) the outcome assessor(s) aware of the intervention or exposure status of participants?	Were the study participants aware of the research question?	Section rating	Comments
MedPAC reports	Yes	Can't tell	Poor	-
Mor 2011	Yes	No	Fair	-
Nyman 1994	Yes	No	Fair	-
Office of the Inspector General and Department of Health and Human Services 1997	Can't tell	Can't tell	Poor	-
Office of the Inspector General and Department of Health and Human Services 2015	Yes	No	Fair	-
Schlenker 1991	Yes	No	Fair	-
Schlenker 2005	Yes	No	Fair	-
Schultz 1994	Yes	No	Fair	-
Sutherland 2013	Yes	Can't tell	Poor	-
Swan 1993	Yes	Can't tell	Poor	-
Swan 2003	Yes	No	Fair	-
Tenand 2020a equal	Yes	No	Fair	-
Tenand 2020b eligibility	Yes	No	Fair	-
Teno 2008	Yes	No	Fair	-
Thorpe 1991	Yes	No	Fair	-
Unruh 2006	Yes	No	Fair	-
Warren 2020	Yes	Yes	Poor	-
White 2003	Yes	No	Fair	-
White 2005	Yes	No	Fair	-
White 2009	Yes	No	Fair	-
Wodchis 2004	Yes	No	Fair	-
Wodchis 2007	Yes	No	Fair	-

Table 73 Data collection methods criteria

Study ID	Were data collection tools shown to be valid?	Were data collection tools shown to be reliable?	Section rating	Comments
Arling 2002	Yes	Yes	Good	-
Arling 2007	No	No	Poor	Staff time measures not shown to be valid
Botz 1993	Yes	Yes	Good	-
Bowblis 2015	Yes	Yes	Good	-
Bowblis 2017	Yes	Yes	Good	-
Boyd 2011	Yes	Yes	Good	-
Cohen 1990	Yes	Yes	Good	-
Collins 2006	Yes	Yes	Good	Content and construct validity checked by researchers; test-retest reliability ranged .67 to .99
Davis 1998	Yes	Yes	Good	-
Dubuc 2011	Yes	No	Fair	Mixed evidence for established reliability and validity for six tools; definition for functional decline used in previous studies by this team
Duell 2017	Yes	Yes	Good	National datasets
Ernst & Young 2019	Can't tell	Can't tell	Poor	-
Feng 2006	Yes	Yes	Good	Authoritative national data sources and survey was developed iteratively using a pilot study and responses were cross-checked against other information to ensure accuracy
GAO 1990	Can't tell	Can't tell	Poor	-
GAO 2002	Yes	Yes	Good	-
Gargett 2010	Can't tell	Can't tell	Poor	Unclear which databases data taken from
Grabowski 2002	Yes	Yes	Good	-
Grabowski 2004	Yes	Yes	Good	-
Hebert 2008b	Yes	No	Fair	Mixed evidence for established reliability and validity for six tools; definition for functional decline used in previous studies by this team
Hebert 2010	Yes	No	Fair	Mixed evidence for established reliability and validity for six tools; definition for functional decline used in previous studies by this team

Study ID	Were data collection tools shown to be valid?	Were data collection tools shown to be reliable?	Section rating	Comments
Hollander 2007	Yes	Yes	Good	-
Kenny 1990	Yes	Yes	Good	-
Konetzka 2006	Yes	Yes	Good	-
Latham 2008	Yes	Yes	Good	-
MedPAC reports	Can't tell	Can't tell	Poor	Tools might have been valid for some outcomes but not all
Mor 2011	Yes	Yes	Good	Authoritative national data sources and survey was developed iteratively using a pilot study and responses were cross-checked against other information to ensure accuracy
Nyman 1994	Yes	Yes	Good	-
Office of the Inspector General and Department of Health and Human Services 1997	No	No	Poor	-
Office of the Inspector General and Department of Health and Human Services 2015	Yes	Yes	Good	-
Schlenker 1991	Yes	Yes	Good	Authoritative national data sources
Schlenker 2005	Yes	Yes	Good	-
Schultz 1994	Yes	Yes	Good	Authoritative state data sources
Sutherland 2013	Can't tell	Can't tell	Poor	-
Swan 1993	Yes	Yes	Good	Data source: 1989 State Medicaid nursing home reimbursement survey in conjunction with a mail survey by the National Governors' Association (NGA). Telephone interviews by the authors obtained data from four States not responding to the NGA survey, filled gaps of unreported data, for clarifications, and collected data on reimbursement to hospital-based nursing homes.

Study ID	Were data collection tools shown to be valid?	Were data collection tools shown to be reliable?	Section rating	Comments
				The use of multiple tools were intended to collect all data possible and be more reliable overall?
Swan 2003	Yes	Yes	Good	Medicare cost reports
Tenand 2020a equal	Yes	Yes	Good	Data sourced from national register
Tenand 2020b eligibility	Yes	Yes	Good	National datasets
Teno 2008	Yes	Yes	Good	-
Thorpe 1991	Yes	Yes	Good	-
Unruh 2006	Yes	Yes	Good	-
Warren 2020	Can't tell	Can't tell	Poor	-
White 2003	Yes	Yes	Good	-
White 2005	Yes	Yes	Good	-
White 2009	Yes	Yes	Good	-
Wodchis 2004	Yes	Yes	Good	-
Wodchis 2007	Yes	Yes	Good	-

Table 74 Withdrawals and drop-outs criteria

Study ID	Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	Section rating	Comments
Arling 2002	Not applicable	Not applicable	Not applicable	-
Arling 2007	Not applicable	Not applicable	Not applicable	-
Botz 1993	Not applicable	Not applicable	Not applicable	-
Bowblis 2015	Not applicable	Not applicable	Not applicable	-
Bowblis 2017	Not applicable	Not applicable	Not applicable	-
Boyd 2011	Not applicable	Not applicable	Not applicable	-
Cohen 1990	Not applicable	Not applicable	Not applicable	-
Collins 2006	Not applicable	Not applicable	Not applicable	-
Davis 1998	Not applicable	Not applicable	Not applicable	-
Dubuc 2011	No	Can't Tell	Poor	-
Duell 2017	Not applicable	Not applicable	Not applicable	-

Study ID	Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	Section rating	Comments
Ernst & Young 2019	Not applicable	Not applicable	Not applicable	-
Feng 2006	Not applicable	Not applicable	Not applicable	-
GAO 1990	Not applicable	Not applicable	Not applicable	-
GAO 2002	Not applicable	Not applicable	Not applicable	-
Gargett 2010	Not applicable	Not applicable	Not applicable	-
Grabowski 2002	Not applicable	Not applicable	Not applicable	-
Grabowski 2004	Not applicable	Not applicable	Not applicable	-
Hebert 2008b	Yes	60 – 79%	Fair	17% dropout experimental, 22% in control
Hebert 2010	Yes	80 – 100%	Good	Drop-outs reported in terms of numbers but not reasons and not per group
Hollander 2007	Not applicable	Not applicable	Not applicable	-
Kenny 1990	Not applicable	Not applicable	Not applicable	-
Konetzka 2006	Not applicable	Not applicable	Not applicable	-
Latham 2008	Not applicable	Not applicable	Not applicable	-
MedPAC reports	Not applicable	Not applicable	Not applicable	-
Mor 2011	Not applicable	Not applicable	Not applicable	-
Nyman 1994	Not applicable	Not applicable	Not applicable	-
Office of the Inspector General and Department of Health and Human Services 1997	Not applicable	Not applicable	Not applicable	-
Office of the Inspector General and Department of Health and Human Services 2015	Not applicable	Not applicable	Not applicable	-
Schlenker 1991	Not applicable	Not applicable	Not applicable	-
Schlenker 2005	Not applicable	Not applicable	Not applicable	-
Schultz 1994	Not applicable	Not applicable	Not applicable	-

Study ID	Were withdrawals and drop-outs reported in terms of numbers and/or reasons per group?	Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).	Section rating	Comments
Sutherland 2013	Not applicable	Not applicable	Not applicable	-
Swan 1993	Not applicable	Not applicable	Not applicable	-
Swan 2003	Not applicable	Not applicable	Not applicable	-
Tenand 2020a equal	Not applicable	Not applicable	Not applicable	-
Tenand 2020b eligibility	Not applicable	Not applicable	Not applicable	-
Teno 2008	Not applicable	Not applicable	Not applicable	-
Thorpe 1991	Not applicable	Not applicable	Not applicable	-
Unruh 2006	Not applicable	Not applicable	Not applicable	-
Warren 2020	Not applicable	Not applicable	Not applicable	-
White 2003	Not applicable	Not applicable	Not applicable	-
White 2005	Not applicable	Not applicable	Not applicable	-
White 2009	Not applicable	Not applicable	Not applicable	-
Wodchis 2004	Not applicable	Not applicable	Not applicable	-
Wodchis 2007	Not applicable	Not applicable	Not applicable	-

Table 75 Intervention integrity criteria

Study ID	What percentage of participants received the allocated intervention or exposure of interest?	Was the consistency of the intervention measured?	Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	Comments
Arling 2002	80 – 100%	No	No	-
Arling 2007	80 – 100%	No	No	-
Botz 1993	80 – 100%	No	No	-
Bowblis 2015	80 – 100%	No	No	
Bowblis 2017	80 – 100%	No	No	-
Boyd 2011	80 – 100%	No	No	-
Cohen 1990	80 – 100%	No	No	-
Collins 2006	80 – 100%	No	No	-
Davis 1998	80 – 100%	No	No	-

Study ID	What percentage of participants received the allocated intervention or exposure of interest?	Was the consistency of the intervention measured?	Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	Comments
Dubuc 2011	60 – 79%	No	Yes	Implementation in experimental group reached 77%
Duell 2017	80 – 100%	No	No	-
Ernst & Young 2019	80 – 100%	No	No	-
Feng 2006	80 – 100%	No	No	-
GAO 1990	80 – 100%	No	No	-
GAO 2002	80 – 100%	No	No	-
Gargett 2010	80 – 100%	No	No	-
Grabowski 2002	80 – 100%	No	No	-
Grabowski 2004	80 – 100%	No	No	-
Hebert 2008b	Less than 60%	Yes	Yes	-
Hebert 2010	60 – 79%	No	Yes	Contamination of comparator group "low but not null", implementation in experimental group passed 70%
Hollander 2007	80 – 100%	No	No	-
Kenny 1990	80 – 100%	No	No	-
Konetzka 2006	80 – 100%	No	No	-
Latham 2008	80 – 100%	No	No	-
MedPAC reports	80 – 100%	No	No	-
Mor 2011	80 – 100%	No	No	-
Nyman 1994	80 – 100%	No	No	-
Office of the Inspector General and Department of Health and Human Services 1997	80 – 100%	No	No	-
Office of the Inspector General and Department of Health and Human Services 2015	80 – 100%	No	No	-

Study ID	What percentage of participants received the allocated intervention or exposure of interest?	Was the consistency of the intervention measured?	Is it likely that subjects received an unintended intervention (contamination or co-intervention) that may influence the results?	Comments
Schlenker 1991	80 – 100%	No	No	-
Schlenker 2005	80 – 100%	No	No	-
Schultz 1994	80 – 100%	No	No	-
Sutherland 2013	80 – 100%	No	No	-
Swan 1993	Can't Tell	No	No	-
Swan 2003	80 – 100%	No	No	-
Tenand 2020a equal	80 – 100%	No	No	-
Tenand 2020b eligibility	80 – 100%	No	No	-
Teno 2008	80 – 100%	No	No	-
Thorpe 1991	80 – 100%	No	No	-
Unruh 2006	80 – 100%	No	No	-
Warren 2020	80 – 100%	No	No	-
White 2003	80 – 100%	No	No	-
White 2005	80 – 100%	No	No	-
White 2009	80 – 100%	No	No	-
Wodchis 2004	80 – 100%	No	No	-
Wodchis 2007	60 – 79%	No	Yes	Implementation in experimental group reached 77%

Table 76 Analyses criteria

Study ID	Indicate the unit of allocation	Indicate the unit of analysis	Are the statistical methods appropriate for the study design?	Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	Comments
Arling 2002	Community	Organization/ institution	Yes	Yes	-
Arling 2007	Community	Organization/ institution	Yes	Yes	-
Botz 1993	Community	Individual	Yes	Yes	-

Study ID	Indicate the unit of allocation	Indicate the unit of analysis	Are the statistical methods appropriate for the study design?	Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	Comments
Bowblis 2015	Community	Individual	Yes	Yes	
Bowblis 2017	Community	Individual	Yes	Yes	-
Boyd 2011	Community	Individual	Yes	Yes	-
Cohen 1990	Community	Organization/ institution	Yes	Yes	-
Collins 2006	Community	Individual	Yes	Yes	-
Davis 1998	Community	Practice/office	Yes	Yes	
Dubuc 2011	Community	Individual	Yes	Yes	-
Duell 2017	Community	Organization/ institution	Yes	Yes	-
Ernst & Young 2019	Community	Practice/office	Can't tell	Can't tell	-
Feng 2006	Community	Organization/ institution	Yes	Yes	-
GAO 1990	Community	Organization/ institution	Can't tell	Can't tell	-
GAO 2002	Community	Individual	Yes	Yes	-
Gargett 2010	Community	Individual	Yes	Yes	-
Grabowski 2002	Community	Organization/ institution	Yes	Yes	-
Grabowski 2004	Community	Individual	Yes	Yes	-
Hebert 2008b	Community	Individual	Yes	Yes	-
Hebert 2010	Community	Individual	Yes	Yes	-
Hollander 2007	Community	Individual	Yes	Yes	-
Kenny 1990	Community	Organization/ institution	Yes	Yes	-
Konetzka 2006	Community	Individual	Yes	Yes	-
Latham 2008	Community	Individual	Yes	Yes	-
MedPAC reports	Community	Individual	Can't tell	Can't tell	-
Mor 2011	Community	Organization/ institution	Yes	Yes	-
Nyman 1994	Community	Individual	Yes	Yes	-
Office of the Inspector General and Department of	Community	Organization/ institution	Yes	Yes	-

Study ID	Indicate the unit of allocation	Indicate the unit of analysis	Are the statistical methods appropriate for the study design?	Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?	Comments
Health and Human Services 1997					
Office of the Inspector General and Department of Health and Human Services 2015	Community	Individual	Yes	Yes	-
Schlenker 1991	Community	Practice/office	Yes	Yes	All analyses used facility as unit of analysis
Schlenker 2005	Community	Individual	Yes	Yes	-
Schultz 1994	Community	Practice/office	Yes	Yes	-
Sutherland 2013	Community	Organization/ institution	Can't tell	Can't tell	-
Swan 1993	Community	Practice/office	Yes	Yes	-
Swan 2003	Community	Practice/office	Yes	Yes	-
Tenand 2020a equal	Community	Individual	Yes	Yes	-
Tenand 2020b eligibility	Community	Individual	Yes	Yes	-
Teno 2008	Community	Organization/ institution	Yes	Yes	-
Thorpe 1991	Community	Organization/ institution	Yes	Yes	-
Unruh 2006	Community	Organization/ institution	Yes	Yes	-
Warren 2020	Community	Individual	Can't tell	Can't tell	-
White 2003	Community	Organization/ institution	Yes	Yes	-
White 2005	Community	Organization/ institution	Yes	Yes	-
White 2009	Community	Organization/ institution	Yes	Yes	-
Wodchis 2004	Community	Individual	Yes	Yes	-
Wodchis 2007	Community	Individual	Yes	Yes	-

Appendix E Regression analysis results for service user outcomes

Table 77 Regression analysis results for service user outcomes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
Dubuc 2011	Change in unmet needs score (Change in log (1+unmet needs score))	1		Disability, gender (female), living alone, cognitive functioning, empowerment, rate of change disability	Living in an area identified for implementation of the intervention was associated with initially more unmet needs, but also with a steeper decrease over time.	Yes
Grabowski 2002	Bedsores	1-2	All markets	Hospital area wage rate, a Herfindahl index, the median per capita income, elderly individuals per square mile, the average Medicaid reimbursement rate, an activities of daily-living-score, the natural log of total residents and binary indicators for nonprofit-owned, government-owned, chain-owned, and hospital-based facilities	Case-mix reimbursement not associated with change in prevalence of bedsores in Model 1 (without state and fixed year effects) and Model 2 (with state and fixed year effects).	No
		3	Least restrictive markets		Case-mix reimbursement not associated with change in prevalence of bedsores	No
		4	Most restrictive markets		Case-mix reimbursement not associated with change in prevalence of bedsores	No
	Physical restraints	1-2	All markets		Case-mix reimbursement associated with increased prevalence of physical restraints in Model 1 (without state and fixed year effects) and Model 2 (with state and fixed year effects)	Yes
		3	Least restrictive markets		Case-mix reimbursement not associated with change in prevalence of physical restraints	No
		4	Most restrictive markets		Case-mix reimbursement not associated with change in prevalence of physical restraints	No
	Catheters	1-2	All markets		Case-mix reimbursement not associated with prevalence of catheters with or without state and year fixed effects.	No

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
		3	Least restrictive markets		Case-mix reimbursement not associated with prevalence of catheters.	No
		4	Most restrictive markets		Case-mix reimbursement associated with increased prevalence of catheters.	Yes
	Feeding tubes	1-2	All markets		Case-mix reimbursement associated with decreased prevalence of feeding tubes in Model 1 (without fixed effects).	Yes
		3	Least restrictive markets		Case-mix reimbursement not associated with prevalence of feeding tubes.	No
		4	Most restrictive markets		Case-mix reimbursement associated with decreased prevalence of feeding tubes.	Yes
Grabowski 2004b	Pain	1		Medicaid payment - quartile 2 / 3 / 4, wage index, median per capita income ($1,000s), elderly per square mile, chain ownership, number of beds (quartiles), tightest quartile, Herfindahl-Hirschmann index, nonprofit ownership, government ownership	Use of a case-mix payment system was associated with reduced prevalence of pain and reduced use of physical restraints, but was not associated with any change in prevalence of pressure ulcers.	Yes
	Pressure ulcers	1			Use of a case-mix payment system was not associated with any change in prevalence of pressure ulcers.	No
	Physical restraints	1			Use of a case-mix payment system was associated with reduced use of physical restraints.	Yes
Konetska 2006	Urinary tract infection	1		Prospective payment system * Medicare 0-6% / 6-12% / 12-25% / 25-100%, Balanced Budget Refinement Act * Medicare 0-6% / 6-12% / 12-25% / 25-100%, age, gender (female 1), activities of daily living dependence, cognitive	The introduction of the prospective payment system for Medicare was associated with increased risk of urinary tract infection. The effect was roughly proportional to the facility's share of residents funded by Medicare.	Yes
	Pressure sores	1			The introduction of the prospective payment system for Medicare was associated with	Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
				impairment, comatose, Alzheimer's or other dementia, stroke, heart disease, cancer, diabetes, depression, Medicare payer source	increased risk of pressure sores. The effect was roughly proportional to the facility's share of residents funded by Medicare.	
Latham 2008	Likelihood of receiving occupational therapy 1995 / 1999 / 2001	1	Skilled nursing facility	Age, race, sex, marital status, income, education, metro location, facility residence, condition, and activities of daily living score	Residents in skilled nursing facilities were found to be significantly more likely to receive physical therapy in 1999 and 2001 compared to 1995.	No – year effects only before and after legislative change to introduce case-mix payment
	Likelihood of receiving occupational therapy 1995 / 1999 / 2001	1	Home health agency		Service users in home health settings were not more likely to receive physical therapy in 1999 or 2001 compared to 1995.	No
	Likelihood of receiving physical therapy 1995 / 1999 / 2001	1	Skilled nursing facility		Residents in skilled nursing facilities were found to be significantly more likely to receive occupational therapy in 1999 and 2001 compared to 1995.	No – year effects only before and after legislative change to introduce case-mix payment
	Likelihood of receiving physical therapy 1995 / 1999 / 2001	1	Home health agency		Service users in home health settings were not more likely to receive occupational therapy in 1999 or 2001 compared to 1995.	No
Mor 2011	Activity of daily living decline <5%	1		Time trends (dummy variables), state effects (dummy facility variables), average admission nursing case-mix index, percentage of long-stay residents who were African-American, number of admissions per bed as surrogate for facility post-acute population	Case-mix reimbursement not associated with changes in functional decline, though greater state spending overall was associated with improvements.	No
	Restraint use <1%	1			Case-mix reimbursement not associated with changes in use of restraints.	No
	Pressure ulcer worsening <2%	1			Case-mix reimbursement not associated with changes in functional decline, though greater	No

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
					state spending overall was associated with improvements.	
	Persistent pain <1%	1			Case-mix reimbursement not associated with changes in functional decline, though greater state spending overall was associated with improvements.	No
Schlenker 2005	Improved in grooming	1		20-40 Centres for Medicare and Medicaid Services risk factors (including patient demographics, functional status, prognoses, and diagnoses) plus a prospective payment system dichotomy	A majority of scores for improvement and stabilisation in activities of daily living (except bathing, transferring and walking) were significantly more favourable in the prospective payment system period, though the evidence for improvement in instrumental activities of daily living was more mixed, with improvement only in shopping (increased) and telephone use (decreased). Unadjusted scores for improvement in number and status of surgical wounds and adjusted scores for improvement in urinary incontinence and confusion frequency showed decreases under the prospective payment system, though unadjusted scores showed stabilisation and improvement in cognitive functioning and anxiety levels, as well as improvement in behavioural problem frequency. For improved in transferring, stabilised in transferring, and improved in dyspnea, stratified models revealed differences for each stratum compared to the pooled model. Acute care hospitalisation and use of emergent care were reduced, while discharge to community increased.	Yes
	Improved in dressing upper body	1				Yes
	Improved in dressing lower body	1				Yes
	Improved in bathing	1				No
	Improved in toileting	1				Yes
	Improved in transferring	Pooled model and 3 stratified models				Yes
	Improved in ambulation	1				Yes
	Improved in locomotion	1				Yes
	Improved in eating	1				Yes
	Stabilised in grooming	1				Yes
	Stabilised in bathing	1				Yes
	Stabilised in transferring	Pooled model and 3				Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
		stratified models				
	Improved in light meal preparation	1				No
	Improved in laundry	1				No
	Improved in housekeeping	1				No
	Improved in shopping	1				Yes
	Improved in telephone use	1				Yes
	Improved in management of oral medication	1				No
	Stabilised in light meal preparation	1				No
	Stabilised in laundry	1				No
	Stabilised in housekeeping	Pooled model and 3 stratified models				Yes
	Stabilised in shopping	1				Yes
	Stabilised in telephone use	1				Yes
	Stabilised in management of oral medication	1				No

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
	Improved in speech or language	1				No
	Improved in pain interfering with activity	1				No
	Improved in number of surgical wounds	1				Yes (unadjusted)
	Improved in status of surgical wounds	1				Yes (unadjusted)
	Improved in dyspnea	Pooled model and 4 stratified models				No
	Improved in urinary tract infection	1				No
	Improved in urinary incontinence	Pooled model and 4 stratified models				Yes
	Improved in bowel incontinence	1				No
	Stabilised in speech or language	1				Yes (unadjusted)
	Improved in cognitive functioning	1				Yes (unadjusted)
	Improved in confusion frequency	Pooled model				Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
		and 4 stratified models				
	Improved in anxiety level	1				Yes (unadjusted)
	Improved in behavioural problem frequency	1				Yes (unadjusted)
	Stabilised in cognitive functioning	1				Yes (unadjusted)
	Stabilised in anxiety level	1				Yes (unadjusted)
	Acute care hospitalisation	1				Yes
	Discharge to community	1				Yes
	Emergent care	1				Yes
Teno 2008	Feeding tube use	1		Medicaid rate, % Medicare, activity of daily living acuity index, percentage of residents undergoing rehabilitation, county wage index, Years 1994-2002 (1993 reference)	Secular trend of increased average prevalence of feeding tubes over time, while introduction of case mix reimbursement was associated with a slight decrease in average prevalence.	Yes
Unruh 2006	Quality of care (weighted indwelling catheters, physical restraints, pressure sores)	1		Medicare reimbursement policy variables, Balanced Budget Act, Balanced Budget Refinement Act, Benefits Improvement and Protection Act, Licensed nurse hours/resident day, % of Medicare residents, % of Medicaid residents, acuity index, number of beds, for-profit ownership, % of Medicare residents lagged by one year, % of Medicaid residents lagged by one	Regression analysis indicated a negative impact of the Balanced Budget Act of 1997 (introduction of Medicare PPS) and a positive impact of the latter two Acts. However, other facts also had a significant negative impact on quality, including higher resident acuity, higher facility percentage of Medicaid residents, larger facility size, and higher per capita income. Importantly, the presence of a higher percentage of Medicaid residents mitigated the negative effects on quality of the Balanced Budget Act.	Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
				year, chain membership, hospital-based, percentage of population age=>75, per capita income, Herfindahl index, 1999 Medicaid reimbursement rate, Interaction variables, BBA with % Medicaid, BBRA with % Medicaid, BIPA with % Medicaid		
White 2005	Change in % of residents who acquired pressure sore since admission	1		Overall payment impact, Medicare resident fraction in 1997, HSA-level Herfindahl index, overall payment impact * HSA-level Herfindahl index, Medicare resident fraction in 1997 * HSA-level Herfindahl index, Nonprofit, Overall payment impact * Nonprofit, Medicare resident fraction in 1997 * Nonprofit	Medicare resident fraction (fraction of residents with Medicare as primary payer) used to measure exposure of facility to change to the new prospective payment system in 1997. In regression analysis, this exposure was not associated with any change in prevalence of pressure sores.	No
	Change in % of residents who are physically restrained and did not have orders for restraints on admission	1			Medicare resident fraction (fraction of residents with Medicare as primary payer) used to measure exposure of facility to change to the new prospective payment system in 1997. In regression analysis, this exposure was not associated with any change in prevalence in use of physical restraints.	No
	Change in deficiencies	1			Medicare resident fraction (fraction of residents with Medicare as primary payer) used to measure exposure of facility to change to the new prospective payment system in 1997. In regression analysis, this exposure was associated	Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
					with a significant increase in the number of deficiencies.	
Wodchis 2004	Nodal levels of therapy (within 5% of 45, 150, 325, 500, or 720 weekly therapy minutes)	1		Medicare, post-prospective payment system period , Medicare *post- prospective payment system , Medicaid , Medicaid*post-prospective payment system , Medicare part B , private co-pay, Medicaid co-pay , Ohio , admission age , male , lived alone prior , discharge expected, fall , fracture , hip fracture , cardiac , stroke, hypertension , cancer , emphysema , terminal , depressed , resists care , activities of daily living hierarchy, Cognitive Performance Scale, nursing case mix	Under the prospective payment system, the odds of receiving a nodal level of care increased for all residents, particularly for Medicare residents compared to private pay residents.	Yes
	Receives any therapy	1			Prior to the new system, Medicare patients were more likely to receive therapy and to receive greater amounts of therapy. Under the new system, the likelihood of receiving therapy was reduced overall, but the differential advantage for Medicare patients in receiving any therapy was increased for Medicare residents.	Yes
	Therapy time estimate	1			Prior to the new system, Medicare patients were more likely to receive therapy and to receive greater amounts of it. Under the new system, therapy minutes were reduced overall, and the differential advantage for Medicare patients in weekly therapy time decreased slightly.	Yes
Wodchis 2007	Receives therapy	1	Medicaid residents	Medicaid change to prospective case mix, Medicaid prospective case mix constant, Medicaid retrospective cost based system, reimbursement rate, rebase lag (years), total beds, for-profit, hospital-based, percent Medicaid, market competition, CMS area wage index, male, log length of stay, age 85 or over, cardiac conditions, stroke, respiratory conditions, diagnosed depression,	The change from prospective facility-specific payment systems to prospective case-mix adjusted payment was associated with increased probability of a Medicaid resident receiving therapy.	Yes
		1	Medicaid and private pay residents		The change from prospective facility-specific payment systems to prospective case-mix adjusted payment was associated with increased probability of a resident receiving therapy, for both Medicaid and private pay residents.	Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
	Therapy time estimate	1	Medicaid residents	terminal or cancer, recent fall, hip fracture, cognitively impaired, cognitively dependent, physically impaired, physically dependent, resists care, discharge planned, nursing intensity, year 1993 . 1994 / 1995 (1992 reference), state Kansas / Vermont. /Missouri (New York reference)	The change from prospective facility-specific payment systems to prospective case-mix adjusted payment was associated with increased therapy minutes for Medicaid residents.	Yes
		1	Medicaid and private pay residents		The change from prospective facility-specific payment systems to prospective case-mix adjusted payment was associated with increased therapy minutes, for both Medicaid and private pay residents.	Yes

Table 78 Change in quality from 2007 to 2012, stratified by expected change, with no expected change as reference

	Actual rate below price rate by 5%	Actual rate within 5% of price rate	Actual rate above price rate 5-15%	Actual rate above price rate 15+%
Satisfaction (0-100)				
Resident	0.629	-0.156	0.024	-1.382
Family	-1.094*	-0.830**	-0.952*	-0.532
Quality outcomes / practices (% of residents)				
Facility-acquired physical restraints	-3.035***	-2.609***	-2.751***	-1.785***
Facility-acquired catheters	-0.296	0.139	-0.247	-0.399
Feeding tubes	-0.216	-0.394	-0.342	-0.814
Facility-acquired pressure ulcers	0.160	0.519	0.313	-0.422
Facility-acquired contractures	-4.147***	-2.608**	-5.401***	-6.095**
Number of deficiencies	0.0008	0.247	0.745	0.122

Notes: The table reports the change (i.e. trend) in adjusted quality for each group over the FY 2007 to 2012 period. Quality is adjusted using linear regressions controlling for profit status, number of beds, chain membership, hospital-based facilities, presence of Alzheimer's and other special care units, payer mix, occupancy rates, and facility-level case mix measures (acuindex and percent of residents with dementia, psychiatric illness, depression, MR/DD) and facility fixed effects. For deficiency, care practice, and quality outcomes measures, higher numbers imply worse quality. For satisfaction measures, higher numbers imply better quality.

***p,0.01, ** p,0.05, * p,0.1

Source: Bowblis, 2015 [144]

Table 79 Change in quality from 2006 to 2010, stratified by expected change, with no expected change as reference

	No change	Increase 5+%	Decrease 5+%
Resident-level quality measures (binary outcomes)			
Catheter use	0.015	0.004	0.013***
Moderate-severe pain	0.009	0.004	0.001
Decline in physical functioning	0.001	0.006	0.002
Bowel/bladder incontinence	0.046*	0.024*	0.008
Physically restrained	0.001	0.001	0.002
Urinary tract infection	0.032***	0.001	0.003

Pressure ulcers (low-risk resident)	0.005	0.009	0.004
Pressure ulcers (high-risk resident)	0.006	0.003	0.002
Falls with major injury	0.009	0.005	0.007
Antipsychotic medication	0.003	0.001	0.022**
Facility-level quality measures (continuous outcomes)			
Total number of deficiencies	0.809	0.545	0.045
Number of quality of care deficiencies	0.926	0.26	0.134
Number of quality of life deficiencies	0.055	0.271	0.039
Number of administrative/other deficiencies	0.062	0.014	0.051
Resident satisfaction score (0-100)	3.837***	0.947	0.494
Family satisfaction score (0-100)	1.283	0.107	0.33
Number of facilities	391	203	261

Notes. The first column reports the average change in quality for Ohio nursing homes anticipating no change in per diem Medicaid reimbursement. The last two columns report the difference in the change in quality from 2006 to 2010 for the other nursing homes relative to those anticipating no change. All regressions include facility fixed effects and control variables: Not-for-profit ownership; Government ownership; Facility size; Part of multi-facility chain; Hospital-based facility; Alzheimer's special care unit; Other special care unit; % Medicaid residents; % Medicare residents; Occupancy rate; % Residents with dementia; % Residents with psychiatric illness; % Residents depressed; % Residents intellectual disability; Acuindex; County unemployment rate; No. of facility observations; No. of unique facilities.

***p < .01, **p < .05, *p < .1.

Source: Bowblis, 2017 [145]

Appendix F Regression analysis results for cost outcomes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
Arling 2002	Change in direct care costs	1	N/A	1992 direct care cost, small facility, urban, for profit, chain affiliated, hospital affiliated, market concentration, above 1992 ceiling, 1992 case mix score, 1992 operating cost, 1992 capital cost, 1992 Medicaid percentage, 1992 Medicare percentage, 1992 Medicaid admission rate, 1992 Medicare admission rate, 1992 hospitalization rate, change in case mix score, change in Medicaid admission rate, change in Medicare admission rate and change in hospitalization rate.	The analysis showed no direct impact of case mix reimbursement on costs. However, data suggests a positive relationship between change in case mix score and change in direct care costs in both Mississippi and South Dakota. This means that facilities that increased their case mix from 1992-1994, also increased their direct care rates. Further, facilities that had higher operating costs in 1992 had a greater increase in direct care costs than facilities reporting lower operating costs.	N/A
Cohen 1990	Average routine operating cost per patient day	1	N/A	Medicaid reimbursement characteristics such as prospective reimbursement, flat-rate reimbursement, interaction of percentage Medicaid and retrospective reimbursement, interaction of percentage Medicaid and prospective reimbursement, interaction of percentage Medicaid and flat-rate reimbursement and case-mix adjustment. Facility characteristics such as chain ownership non-profit ownership, government ownership, hospital based, physical therapy offered, occupational therapy offered, recreational therapy offered, psychological services by staff, total number of patients, occupancy rate -	The analysis showed no direct impact of case mix reimbursement on costs. However, the evidence suggests that under retrospective and prospective reimbursement, nursing home costs increase with the percentage of Medicaid patients. Facility characteristics are highly associated with operating costs, while case mix variables show that types of patients can affect costs, but not to a large degree.	

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
				certified beds, percentage Medicare and nursing deficiency. Case mix variables such as admissions per bed, long-term care case-mix index and percentage of patients disoriented/confused. Area characteristics such as area wage index, rural location, Northeast Region, North Central Region, South Region, and certified beds per 1000 elderly.		
Davis 1998	Facility costs	1	N/A	Excess capacity (county), home health patients (county), case mix, discharges, RN staffing intensity, code deficiencies, poor quality, reimbursement rate, excess capacity (home), proportion of Medicaid residents, beds, beds-squared, for-profit and chain-operated.	The analysis showed no direct impact of case mix reimbursement on costs or efficiency. However, patients who required more care (higher patient acuity) seemed to be more profitable post case mix reimbursement introduction. The study authors suggest that greater reliance on poor-quality nursing practices increased the homes capacity to manage heavy-care patients more cheaply.	N/A
	Profit margin	1				
	Efficiency	1				
	Change in cost per diem	2				
	Change in profit margin	2				
	Change in efficiency	2				
Nyman 1994	Total annual costs	1	N/A	Type of patient days (A-K) and boarding care patient days	Authors expected a uniform increase in costs per patient day (A-K), but this was not the case. At successively higher case-mix levels, costs sometimes increase and sometimes decrease. Authors believed that nursing homes may have been able to economize on nursing care for certain patient types more than for others.	N/A
Schlenker 1991	Patient care cost per day	1	N/A	Case mix index, case mix/payment system interactions (case mix, facility-specific and	The analysis suggests that there was a strong association between case mix and patient care	Yes

Study ID	Outcome	Model number	Subgroup	Other factors considered in model	Short descriptive summary results	Statistically significant case mix system variable
	Medicaid payment rate Profit ratio (Revenue: Expense)	1 1		class-rate), states by system (Case mix system – Maryland, Ohio, West Virginia; Facility specific system – Colorado, Florida; Class-rate system – Texas, Utah), quality indicators such as proportion with ulcerations, area/market factors such as nursing home peds per elderly, and facility characteristics such as non-profit, rural, Medicare, Medicaid, bed size, occupancy and chain.	cost in case-mix payment systems (and in facility-specific systems) compared to class-rate systems. However, there was no association between case mix and profits in case mix (or facility-specific) systems. This means that there is no evidence that higher profits under case mix payment systems were obtained by facilities with more intense case mix.	
Swan 1993	Medicaid per diem reimbursement rate for skilled nursing facility (SNF)	1	N/A	Year in Period, has case mix Prospective Facility-specific, Prospective Class, combination Prospective-Retrospective, Prospective Adjusted, Interactions-Year by: has case mix, Prospective Facility-specific, Prospective Class, combination Prospective-Retrospective, Prospective Adjusted.	Neither case mix nor its interaction has a significant effect on Medicaid reimbursement rates for skilled nursing facilities. Thus, there is no evidence that case-mix systems allow closer control of rates.	No

Appendix G Regression analysis results for delivery at lowest level of complexity

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
				MODEL 1								
Grabowksi 2002	USA	1991-1998	All homes	Weighted least squares	no fixed effects	minutes index	11	Case-mix reimbursement	0.012	-	0.04	-

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
						minutes index		Medicaid rate	0.168	-	-	-
						minutes index		Nonprofit	−0.309	-	-	-
						minutes index		Government	3.285	-	-	-
						minutes index		Chain	3.894	-	-	-
						minutes index		Hospital-based	7.793	-	-	-
						minutes index		Wage rate ($1,000s)	−0.323	-	-	-
						minutes index		Herfindahl index	−3.154	-	-	-
						minutes index		Per capita income ($10,000s)	−0.106	-	-	-
						minutes index		Elderly per sq. mile (1,000s)	0.456	-	-	-
						minutes index		Constant	91.026	-	-	-
			least restrictive markets	Weighted least squares	fixed effects	minutes index	11	Case-mix reimbursement	3.832	-	0.16	-
						minutes index		Medicaid rate	−0.112	-	-	-
						minutes index		Nonprofit	1.655	-	-	-
						minutes index		Government	−0.6	-	-	-
						minutes index		Chain	1.993	-	-	-

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
						minutes index		Hospital-based	3.381	-	-	-
						minutes index		Wage rate ($1,000s)	1.061	-	-	-
						minutes index		Herfindahl index	−0.366	-	-	-
						minutes index		Per capita income ($10,000s)	0.933	-	-	-
						minutes index		Elderly per sq. mile (1,000s)	26.09	-	-	-
						minutes index		Constant	99.029	-	-	-
			most restrictive markets		fixed effects	minutes index	11	Case-mix reimbursement	1.867	-	0.1	-
						minutes index		Medicaid rate	0.097	-	-	-
						minutes index		Nonprofit	−0.899	-	-	-
						minutes index		Government	1.979	-	-	-
						minutes index		Chain	1.291	-	-	-

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
						minutes index		Hospital-based	5.053	-	-	-
						minutes index		Wage rate ($1,000s)	0.439	-	-	-
						minutes index		Herfindahl index	−9.341	-	-	-
						minutes index		Per capita income ($10,000s)	0.781	-	-	-
						minutes index		Elderly per sq. mile (1,000s)	−0.766	-	-	-
						minutes index		Constant	84.303	-	-	-
				MODEL 2								
				Weighted least squares	fixed effects	minutes index	11	Case-mix reimbursement	3.369	-	0.17	
						minutes index		Medicaid rate	0.027	-		
						minutes index		Nonprofit	0.286	-		

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
						minutes index		Government	3.36	-		
						minutes index		Chain	2.361	-		
						minutes index		Hospital-based	7.898	-		
						minutes index		Wage rate ($1,000s)	0.812	-		
						minutes index		Herfindahl index	−4.936	-		
						minutes index		Per capita income ($10,000s)	0.444	-		
						minutes index		Elderly per sq. mile (1,000s)	2.632	-		
						minutes index		Constant	90.935	-		
Feng 2006	USA	1997-2002	pre and post case mix reimbursement	cross-sectional times-series linear regression	fixed effects	acuity index (OSCAR)	17	Case-mix payment (1/0)	0.0133	p<0.01	0.0015	26.2

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
								CPI-adjusted Medicaid rate (in 2002 dollars)	0.0016	p<0.05	-	-
								Percent of Medicaid LTC spending on HCBS	-0.0057	p<0.01	-	-
								CON for NHs (1/0)w	0.0083	p<0.01	-	-
								For profit (1/0)	-0.0009	ns	-	-
								Chain membership (1/0)	0.00331	ns	-	-

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
								Total number of beds	-0.0018	p<0.01	-	-
								Percent of residents paid by Medicare	0.0023	p<0.01	-	-
								Wage index	0.0085	p<0.05	-	-
								Number of NH beds per 1,000 population 75+	0	ns	-	-
								1997	0.004	p<0.01	-	-
								1998	0.0079	p<0.01	-	-
								1999	0.0086	p<0.01	-	-
								2000	0.0144	p<0.01	-	-
								2001	0.0188	p<0.01	-	-
								2002	0.0237	p<0.01	-	-
								intercept	2.3438	p<0.01	-	-

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
				cross-sectional times-series linear regression	fixed effects	RUG-III NCMI admission	13	Case-mix payment (1/0)	0.0248	p<0.01	0.1563	124.9
								CPI-adjusted Medicaid rate (in 2002 dollars)	0.0027	p<0.01		
								Percent of Medicaid LTC spending on HCBS	-0.0022	p<0.1		
								For profit (1/0)	0.0034	ns		
								Chain membership (1/0)	0.0055	P<0.05		
								Total number of beds	0.0021	p<0.01		
								Percent of residents paid by Medicare	0.008	p<0.01		
								Wage index	0.0021	ns		
								Number of NH beds per 1,000 population 75+	-.0001	ns		
								2000	0.009	p<0.01		

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
								2001	0.0209	p<0.01		
								2002	0.0345	p<0.01		
								intercept	-0.1112	p<0.01		
				cross-sectional times-series linear regression	fixed effects	RUG-III NCMI long stay	13	Case-mix payment (1/0)	0.0144	p<0.01	0.0706	57.2
								CPI-adjusted Medicaid rate (in 2002 dollars)	0.0044	p<0.01		
								Percent of Medicaid LTC spending on HCBS	0.0003	ns		
								For profit (1/0)	0.0016	ns		
								Chain membership (1/0)	0.0041	p<0.05		
								Total number of beds	-0.0006	ns		

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
								Percent of residents paid by Medicare	0.002	p<0.01		
								Wage index	-0.0026	ns		
								Number of NH beds per 1,000 population 75+	0	ns		
								2000	0.0029	p<0.01		
								2001	0.0073	p<0.01		
								2002	0.013	p<0.01		
								intercept	-0.3474	p<0.01		
Kenney 1990	USA	1985	non case mix states	weighted least squares	'-	mean length of stay	13	Nursing home reimbursement case-mix adjustment	0.3		65%	
Kenney 1990	USA	1985						Medicare cost-to-ceiling ratio <0.9	0.14			
Kenney 1990	USA	1985						Medicare cost-to-ceiling ratio >1.05	0.24			

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
Kenney 1990	USA	1985						Nursing home reimbursement flat rate	0.38			
Kenney 1990	USA	1985						Nursing home reimbursement strong prospective	0.48			
Kenney 1990	USA	1985						Nursing home reimbursement weak prospective	0.29			
Kenney 1990	USA	1985						Beds per 1,000	-0.1			
Kenney 1990	USA	1985						Medicare certified beds (% of total)	0.24			
Kenney 1990	USA	1985						SNF certified beds (% of total)	-0.37			
Kenney 1990	USA	1985						Long-term care arrangement Swing beds	-0.35			
Kenney 1990	USA	1985						Long-term care arrangement own SNF unit	-0.32			
Kenney 1990	USA	1985						Long-term care arrangement Swing beds and units	-0.72			

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
Kenney 1990	USA	1985						Long-term care arrangement designated provider	-0.12			
Kenney 1990	USA	1985				long stays (proportion of discharges with length of stay exceeding the mean but less than the outlier)	13	Nursing home reimbursement case-mix adjustment	0.025		33%	
Kenney 1990	USA	1985						Medicare cost-to-ceiling ratio <0.9	-0.002			
Kenney 1990	USA	1985						Medicare cost-to-ceiling ratio >1.05	-0.002			
Kenney 1990	USA	1985						Nursing home reimbursement flat rate	0.025			
Kenney 1990	USA	1985						Nursing home reimbursement strong prospective	0.022			
Kenney 1990	USA	1985						Nursing home reimbursement weak prospective	0.017			

Study ID	Country	Year	Comparison group	Analysis type	model	Dependent variable	N predictor variables	List predictor variables	Slope/ coefficient	Significance	R-square	F statistic
Kenney 1990	USA	1985						Beds per 1,000	-0.0007			
Kenney 1990	USA	1985						Medicare certified beds (% of total)	0.015			
Kenney 1990	USA	1985						SNF certified beds (% of total)	-0.016			
Kenney 1990	USA	1985						Long-term care arrangement Swing beds	-0.03			
Kenney 1990	USA	1985						Long-term care arrangement own SNF unit	-0.025			
Kenney 1990	USA	1985						Long-term care arrangement Swing beds and units	-0.065			
Kenney 1990	USA	1985						Long-term care arrangement designated provider	-0.008			


HRB
Health
Research
Board