

Summary findings

2007 Bibliometric Study of Irish Health Research in an International Context

Introduction

In this study, we compare the output and related impact of publications in the field of health research from the Republic of Ireland to international benchmarks. Comparison is made with Finland, the UK and the USA, and also with the regional output of the EU-25 countries grouped together. The domain of health research in this study consists of four major fields, namely Basic Medical Sciences, Clinical Medicine, Clinical-Experimental Basic Medicine, and Health Sciences. These four fields comprise a series of sub-fields, and are made up of groupings of journals which publish articles in these areas of research. These groupings have been defined by the well-known international citation indexes produced by the former Institute for Scientific Information (ISI), known nowadays as Thomson Scientific.

The study is based on a quantitative analysis of scientific articles published in journals processed for the internet version of the **Science Citation Index Expanded (SCI)**, the **Social Science Citation Index (SSCI)**, and the **Arts & Humanities Citation Index (A&HCI)**, better known as the **Web of Science (WoS)**.

Key findings

When we consider the total Irish output for all fields of health research combined, we observe that it is increasing in terms of the number of publications, and that this pace is faster than that of the comparator countries and larger regions. The impact of Irish health research, expressed in mean impact scores, has increased over the period 1999-2005. Compared to a world standard, Ireland is steadily improving its position, and has now reached a status where Irish health researchers are active at roughly the worldwide average impact level.

The fields in which Ireland is performing most strongly are Clinical Medicine and Clinical-Experimental Basic Medicine. Here we find an increase in output of publications, in combination with an increase in impact level, which is up to 10% above worldwide average field impact level (for the former field). In Clinical-Experimental Basic Research., Irish output is up to 20 per cent above worldwide average field impact level. The output of the other two fields, Basic Medical Sciences and Health Sciences, is relatively stable, while the impact of the latter field has decreased over the period 1999-2005.

In general, we observe that Ireland does not equal the impact levels generated by the countries selected for benchmarking, although the position is improving. However, when compared with the EU-25, we observe that Ireland is performing better than the EU-25 average impact level in three of the four fields of health research, with Health Sciences as the only field in which the EU-25 performs better than Ireland.

Sub-fields in which Ireland is performing above worldwide average impact level are:

- Cardiac & cardiovascular systems
- Dermatology

- Gastroenterology
- Immunology
- Obstetrics & gynecology
- Clinical neurology
- Peripheral vascular diseases
- Rheumatology
- Transplantation
- Veterinary sciences.

In all these sub-fields, we find field-normalized impact scores that are roughly 30 per cent above worldwide average level.

Conclusion

First, a few general comments on the use of bibliometric indicators for the assessment of research performance. It is our experience in previous studies on research performance in the natural and life sciences, medicine, the humanities, and in the social and behavioral sciences, that bibliometric indicators provide useful information to a peer review committee evaluating research performance. These studies revealed a fair correspondence between the results of bibliometric analyses on the one hand, and judgements on scientific quality by peers on the other hand. In our view, a quality judgement on a research unit, department or institute can only be given by peers, based on a detailed insight into content and nature of the research conducted by the group or institute in question. The citation-based indicators applied in this study measure the impact at the short or medium-to-long term of research activities at the international research front, as reflected in publication and citation patterns. Impact and scientific quality are not necessarily identical concepts.

Bibliometric indicators cannot be interpreted properly without background knowledge on both the research units that are evaluated, and the subfields in which the research units are active. In fact, in previous studies we have encountered a few cases in which a bibliometric indicator pointed in one direction (e.g. a low impact), while statements by peers or even other indicators pointed in another direction (e.g. a high quality). Analyzing such discrepancies from a bibliometric point of view, specific limitations related to the bibliometric methodology applied in the study in question may be identified. While in most cases such limitations hardly affect the results or have no effect at all, in exceptional cases the bibliometric outcomes may provide an incomplete or even distorted picture. For instance, the classification of journals into subfields ('journal categories') may be less appropriate for some research units, particularly when they are active in topics of a multidisciplinary nature. Then, in the calculation of the impact compared to the world subfield citation average, this world average may not be representative for the subfield in which such a research group or institute is active. If there are strong indications that the definition of the (sub) field in terms of journal categories is inadequate, then the journal-based world average (*JCSm*) is more appropriate. In particular, this latter case pertains to developing new interdisciplinary fields.

A second limitation concerns the coverage of the Citation Indices (CI). In specific subfields, particularly in applied or technical sciences, the CI coverage may be less adequate. Consequently, for research units which are active in such technical/applied subfields, the bibliometric results may provide an incomplete picture. A second point concerns non-CI publications (e.g. articles in journals that are not, or no longer, covered by CI). For a number of research units, valuable additional information may be obtained by retrieving impact data for non-CI publications.

Another example of a limitation of bibliometric analysis relates to time delays. It may take several years for a collection of papers to generate a high impact. We have analyzed research units that had generated only a moderate impact at the time. Confronted with the bibliometric results, several peers stated that these research units had recently made important contributions to the field. When we updated the results after a few years, several research units indeed showed a sharply rising impact curve.

We do not wish to imply that all discrepancies between bibliometric indicators and peer judgements are necessarily due to problems or limitations of the bibliometric methods applied (Nederhof, 1988). Equally, it would not be appropriate to attribute such discrepancies only to peers expressing incorrect or biased views on the scientific quality of a research unit. Still, reasoning from the point of view of the bibliometrician, discrepancies between bibliometric indicators and peer judgements often constitute a research problem in itself and a considerable effort is often required to examine such a discrepancy in sufficient detail.

Nevertheless, peer review also has its disadvantages (van Raan, 1996). Therefore, the appropriate combination of peer-based qualitative and quantitative assessment, particularly bibliometric indicators, appears to be the most successful approach in order to reinforce objectivity, transparency, comparability and reproducibility in the assessment of research performance.

As stated in the Results section of the report, Ireland has the smallest output of the four entities compared (Finland the UK, the USA, and the EU-25). However, in a number of fields or sub-fields, we observe high impact scores for Ireland in health research. In health research overall, Ireland has an impact that is significantly above worldwide average impact level, and performs as such better than the EU-25. The other three entities compared do have higher impact scores than the level observed for Ireland.

On the level of fields, we find a high impact for Ireland in Clinical Medicine (significantly above worldwide average impact level), an impact at worldwide impact level in Clinical-Experimental Basic Medicine, and impact scores below average field impact level for Basic Medicine, and Health Sciences. When we focus on the lowest level of analysis in the study, we find that Ireland has a high impact position in a number of Journal Subject Categories: Cardiac & cardiovascular systems, dermatology, gastroenterology, immunology, medical laboratory technology, neuroimaging, peripheral vascular diseases, psychiatry, rheumatology, transplantation, and veterinary sciences. Impact scores somewhat lower are found for haematology and pharmacology & pharmaceuticals.

In terms of visibility among performers of absolute top worldwide scientific research in health research, we observe that Ireland performs in overall health research at a level where actual and expected numbers are in balance. By this we mean that the proportion of Irish papers in the top five per cent of cited papers in their field is generally what would be expected based on the overall output of papers. This is particularly true in the sub-field Clinical Medicine, a sub-field in which Ireland equals the expected number with its actual number of top publications in the top five per cent most highly cited range.

However, in the other sub-fields, Ireland performs somewhat lower than might be expected on the basis of output numbers in those sub-fields.

There is little basis on which direct comparison can be made between the results of this study and those from an earlier study, which was conducted by CIRCA and ISI in 1999. The 1999 study showed a gradual increase in the output of health research papers, and also a gradual improvement in citation rates. This trend has continued in the period under study in the current report. However, the classification of journals used in the 1999 study, and the analyses conducted, are different in the two studies.