

The 100 Citation Classics in the Irish Medical Literature; A Bibliometric Analysis

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Abstract

Identifying citation classics is a valuable metric of research performance. Ireland has a distinguished history of medical research, although Ireland's top-cited articles are unknown. The SCOPUS database identified all medical and surgical articles published by journals in the Republic of Ireland or Northern Ireland. The 100 top-cited articles were analysed. The most cited article received 240 citations. There is an observed trend of increasing number of authors over time ($p < 0.05$). General medicine and public health are the most common topics. The majority of works originate from Irish institutions. Collaborative research and non-Irish research are poorly represented among the citation classics. The Irish medical literature contains multiple highly cited and influential articles.

Introduction

Bibliometrics involves the statistical analysis and evaluation of literature and publications. It is a powerful tool for assessing information, citations and measuring activity on publications available from medical databases^{1,2}. Scopus is a bibliometric database created by Elsevier which includes all MEDLINE databases and allows comprehensive citation analysis³. The number of citations can be used to evaluate the influence of a publication and its potential impact on patient care^{4,5}. Exploring the highest cited articles can help scholars become familiar with "classic" landmark studies and can highlight areas for future research⁶. For these reasons, citation classics have been described as the "gold bullion of science"^{7,8}.

The aim of this study was to include all articles published within Irish medical journals, including all medical and surgical specialities, to determine which articles have received the highest number of citations. To our knowledge, this is the first time that the full scope of Irish medical literature has been analysed to determine the most cited articles. This study is informative to those seeking to discover the "classic" landmark studies published in Ireland and identify particular areas of excellence in the Irish medical literature. Additionally, it serves an instructive role for those currently undertaking research to potentially increase citations by emulating the characteristics of successful articles.

Methods

Articles were obtained by searching the Scopus database on the 10th of July 2019³. By using the 'Advanced Search' option, ISSNs of the medical journals based primarily in Republic of Ireland or Northern Ireland were stringed using the 'OR' operator and subsequently searched within the database. This option was comprehensive as it searched for all types of publications within these journals. The journals included in the search and thus comprising 'The Irish Medical Literature' for the purpose of this study were the 'Irish Medical Journal' (formerly the 'Journal of the Irish Medical Association'), the 'Irish Journal of Medical Science', the 'Ulster Medical Journal' and the 'Irish Journal of Psychological Medicine.' Journals only partly associated with Ireland were excluded.

Once all articles published in the medical journals based in Ireland were retrieved, they were sorted in order of descending citation count to determine the top 100 most cited articles. The titles and abstracts of these articles were examined. Information was recorded for each article, including the journal name, year of publication, citation count, names of authors, number of authors, institutions involved, modality and specialty. The variation in number of authors over time was assessed with a one-way ANOVA test using SPSS version 23 (IBM, New York, USA).

Results

A total of 20,152 articles have been published by medical journals in Ireland according to the Scopus database³. The 100 articles with the most citations were analysed. A list of the top 10 of these 100 most cited articles are presented in *Table 1*. The number of article citations ranged from 240 to 33 (mean 52.51, St Dev 31.06). Five articles had 100 or more citations.

Table 1. The top 10 most cited publications of Medical Journals based in Ireland.

Rank	Year	Authors & Institution	Title	Journal	Citations
1	2008	Aroori, S., Spence, R.A. Belfast Health and Social Care Trust, Northern Ireland	Carpal tunnel syndrome	Ulster Med J	240
2	1962	Johnston, G.W. Royal Victoria Hospital Belfast, Northern Ireland	A follow-up of one hundred cases of fracture of the head of the radius with a review of the literature	Ulster Med J	211
3	1958	O'Meara, R.A. Trinity College, Dublin, Republic of Ireland	Coagulative properties of cancers	Ir J Med Sci	133
4	1993	MacGowan, S.W., Sidhu, P., Aherne, T., Luke, D., Wood, A.E., Neligan, M.C., McGovern, E. Mater Misericordiae Hospital, Dublin, Republic of Ireland	Atrial myxoma: National incidence, diagnosis and surgical management	Ir J Med Sci	106
5	1954	Allison, R.S., Millar, J.H. Royal Victoria Hospital Belfast and Queens University Belfast, Northern Ireland	Prevalence of disseminated sclerosis in Northern Ireland	Ulster Med J	102
6	1994	O'Hare, J.A., Abuaisha, F., Geoghegan, M. Limerick Regional Hospital, Dooradoyle, Republic of Ireland	Prevalence and forms of neuropathic morbidity in 800 diabetics	Ir J Med Sci	98
7	2011	Dinas, P.C., Koutedakis, Y., Flouris, A.D. University of Thessaly, Greece	Effects of exercise and physical activity on depression	Ir J Med Sci	91
8	2009	Stuckler, D., Basu, S., Suhrcke, M., McKee, M. Oxford University, England	The health implications of financial crisis: A review of the evidence	Ulster Med J	84
9	1990	Ritchie, C.M., Atkinson, A.B., Kennedy, A.L., Lyons, A.R., Gordon, D.S., Fannin, T., Hadden, D.R. Royal Victoria Hospital Belfast, Northern Ireland	Ascertainment and natural history of treated acromegaly in Northern Ireland	Ulster Med J	80
10	2006	Lappin, T.R., Grier, D.G., Thompson, A., Halliday, H.L. Queen's University Belfast, Royal Maternity Hospital Belfast, Northern Ireland	HOX genes: Seductive science, mysterious mechanisms	Ulster Med J	77

The years of publication ranged from 1944 to 2014. The year with the most publications was 2000, which had eight. The 2000s was the decade with the most top 100 publications, numbering 42. The number of authors ranged from 1-10 (mean 3.68, St Dev 2.03). The most frequent number of authors was two, found in 20 articles. The mean number of authors per article has increased over time; in the 1960s the mean was 1.0, in the 1980s it was 2.4 and in the 2000s it had further increased to 4.4 ($p=0.001$).

Sixty-nine of the articles were from a single Irish institution, including both the Republic of Ireland and Northern Ireland. Twenty-two of the publications were collaborations involving multiple Irish institutions. Nine articles involved only non-Irish institutions. The Irish Journal of Medical Science published 44 of the top 100 articles, followed by the

Irish Medical Journal with 29 articles, the Ulster Medical Journal with 21 articles and the Irish Journal of Psychological Medicine with six articles. The hospitals with most publications were the Mater Misericordiae Hospital and St. James Hospital, each with 11 publications. The fields of medicine that were represented most frequently were general medicine (16 articles), public health and epidemiology (15 articles), psychology (10 articles) and general surgery (9 articles).

Discussion

This study seeks to identify the most impactful articles in the Irish medical literature. Ireland has a strong history of medical research. Both the Republic of Ireland and Northern Ireland have previously been ranked in the top 20 countries for citations per paper⁹ and Ireland has been shown to have one of the highest mean impact factors for surgical publications¹⁰. Previous bibliometric studies have focused on Ireland's output in a specific medical field, for example in orthopaedic surgery, plastic surgery or radiology¹¹⁻¹³. These do not adequately demonstrate the broad scope of the multiple medical and surgical specialties published in Ireland. A wide range of topics and medical disciplines are represented among the top 100 most cited articles. General Medicine and Public Health and Epidemiology were the most represented specialties, perhaps unsurprising given the large scope of these fields.

It is striking to observe that a majority, sixty-nine articles (69%), involved single institutions with no collaboration. This may relate to a low rate of completion of collaborative between institutions. For a small country such as Ireland, there would be potential benefits to establishing programmes for formal collaborative research^{13,14}. We found nine of the articles were affiliated with non-Irish institutions. As well as increasing collaboration among Irish institutions, collaborations with international institutions could be potentially advantageous.

Over time, the average number of authors per article has increased. This increase has been reflected across the medical literature, with previous studies demonstrating that between 1960-2010 the average authorship increased more than three-fold¹⁵. This authorship inflation does not appear related to the complexity of the studies; rather, it has been suggested to relate to pressures on funding and promotion¹⁵. There are ongoing challenges to research in Ireland, including long working hours, limited research funding and limited protected time for research. Aspiring clinicians should take inspiration from researchers who have shown that it is possible to publish highly respected and highly cited work in Ireland.

This study has certain limitations. It does not include articles from Irish authors published in journals based outside of Ireland; however this was not the focus of our research. We made the assumption that articles with higher citations are considered more influential⁴, although some older influential articles have been incorporated into common knowledge and therefore are no longer as frequently cited.

In conclusion, medical journals based in Ireland have published many highly cited articles, some of which have over 100 citations. The characteristics and trends of these citation classics will be useful to inform and guide future research.

Declaration of Conflicts of Interest:

The authors declare that they have no conflict of interest.

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