

Plastic and Reconstructive Surgical Research in Australia and New Zealand: A Bibliometric Analysis

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Citation

Perotti OM, Holwill S, Sreedharan S, Reilly DJ, Rozen WM, Hunter-Smith DJ. Plastic and reconstructive surgical research in Australia and New Zealand: a bibliometric analysis. *Australasian Journal of Plastic Surgery*. 2018; 1(1): 163-168.

Accepted for publication: 8 December 2017.

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Abstract

Background: Bibliometrics is the analysis of research produced by individuals and institutions. While previous analyses have assessed sub-specialty fields, as well as contributions of individual countries to the Plastic surgical literature, no bibliometric analyses to date have measured the contribution of Plastic Surgeons from Australia and New Zealand.

Methods: Plastic Surgery journals with the 15 highest impact factors were identified. Total publications in a ten-year period from October 2007 to September 2017 by Australian and New Zealand Plastic Surgeons were recorded, as were *h*-indices for all surgeons.

Results: 588 articles were published by 498 surgeons, with the largest numbers in *Plastic and Reconstructive Surgery* (142), *Burns* (133), and the *Journal of Plastic, Reconstructive and Aesthetic Surgery* (112). Mean *h*-index for Associate Professors was 9.29, and for Professors was 17.17.

Conclusion: Australian and New Zealand Plastic Surgeons continue to be actively involved in world-class research and innovation. The volume and quantity of research produced supports the development of an *Australasian Journal of Plastic Surgery*.

Key words: Bibliometrics; Australia; New Zealand; Plastic Surgery; Publications

Introduction

Australia and New Zealand have long been at the forefront of advances in Plastic and Reconstructive Surgery. From the fathers of modern Plastic Surgery,¹ through to pioneers in reconstructive microsurgery,² to groundbreaking advances in areas such as stem cells and tissue engineering,³ the Antipodean contribution to the discipline cannot be overstated.

Bibliometrics is the analysis of research produced by individuals and institutions, incorporating the volume of publications as well as their impact and citations. Bibliometric analyses of publications in the field of Plastic Surgery have previously been used to identify significant research in sub-specialty areas,⁴⁻⁸ as well as the contributions of individual countries to the discipline.^{9, 10} A recent study has assessed the research produced by orthopaedic surgeons in Australia.¹¹

To date, no studies have investigated the quantity or impact of research by Plastic Surgeons in Australia or New Zealand. The introduction of the *Australasian Journal of Plastic Surgery* serves as an opportunity to celebrate the ongoing contribution of local surgeons to the plastic surgical literature.

Methods

A list of all consultant Plastic Surgeons in Australia and New Zealand was collated by cross-referencing databases of surgeons through the Royal Australasian College of Surgeons (RACS), Australian Society of Plastic Surgeons (ASPS), and New Zealand Association of Plastic Surgeons (NZAPS). Surgeons whose primary practice is located outside Australia or New Zealand were excluded.

The top ranking Plastic Surgery journals were identified using impact factors for the most recent year available (2016) using the Web of Science database (Thomson Reuters, New York, USA).¹² A literature search was performed using the database for articles published by each surgeon over a 10-year period from 1 October 2007 to 30 September 2017. Original research, systematic reviews, meta-analyses, and case reports were included; letters, commentaries and editorials were excluded. Research accepted for publication but not yet published was also excluded.

Bibliographic details were recorded for each eligible article (journal, year, volume, issue and pages). In addition, the type of article was recorded, as well as the region of origin (Australian states and territories or New Zealand). In cases where multiple surgeons served as authors, the region of the first-listed author was recorded. Lifetime *h*-index was also recorded for each surgeon. Results were analysed using Sigmaplot 13 (Systat Software Inc, San Jose CA, USA).

Results

The journals with the highest impact factors are listed in Table 1. 512 surgeons were identified; 14 listed their primary place of practice outside Australia or New Zealand, and were excluded. The remaining 498 surgeons were based in the Australian Capital Territory (5), New South Wales (127), the Northern Territory (2), Queensland (66), South Australia (41), Tasmania (10), Victoria (141), Western Australia (47) and New Zealand (59).

In total, 588 articles were published over the study period. The largest number of publications was in *Plastic and Reconstructive Surgery* (PRS, 142), followed by *Burns* (133) and the *Journal of Plastic, Reconstructive & Aesthetic Surgery* (JPRAS, 112). The number and type of publications are summarised in Table 1.

Table 1 Total publications by ANZ Plastic Surgeons in 15 top-ranking Plastic Surgery journals 2007-2017

Journal	Impact Factor	Original Research	Review Articles	Case Reports	Total Publications
Plastic & Reconstructive Surgery	3.843	108	14	20	142
JAMA Facial Plastic Surgery	2.703	0	0	0	0
Aesthetic Surgery Journal	2.697	9	4	2	15
Journal of Reconstructive Microsurgery	2.216	15	6	6	27
Journal of Hand Surgery (European)	2.191	8	1	2	11
Microsurgery	2.156	24	5	7	36
Burns	2.056	113	15	5	133
Journal of Plastic, Reconstructive & Aesthetic Surgery	2.048	81	11	20	112
Clinics in Plastic Surgery	1.658	1	3	0	4
Journal of Hand Surgery (American)	1.606	13	0	4	17
Annals of Plastic Surgery	1.596	19	10	1	30
Facial Plastic Surgery Clinics of North America	1.568	0	0	0	0
Journal of Burns Care and Research	1.349	31	8	2	41
Aesthetic Plastic Surgery	1.32	18	1	1	20
Ophthalmic Plastic Surgery	1.242	0	0	0	0
Total		440	78	70	588

The highest number of publications overall was from Victoria (282), followed by Western Australia (104) and New South Wales (101). On a per surgeon basis, however, Western Australia had the highest results (2.21), followed by Victoria (2.00) and South Australia (1.22). Region of origin for publications is summarised in Fig. 1.

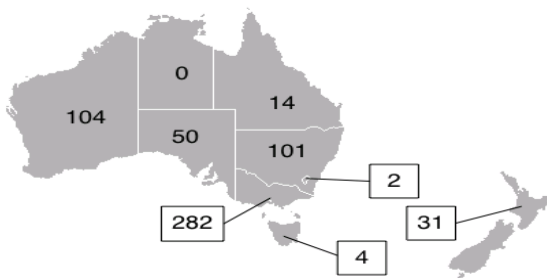


Fig. 1 Number of publications from each region of Australia and New Zealand in top-ranking journals 2007-2017.

Lifetime *h*-index for each surgeon was recorded, and is summarised in Fig. 2. A sub-group analysis was performed according to academic positions (Fig. 3). Seventeen Associate Professors had a mean *h*-index of 9.29 (median 7, range 0-24), and 12 Professors had a mean *h*-index of 17.17 (median 13.5, range 0-45).

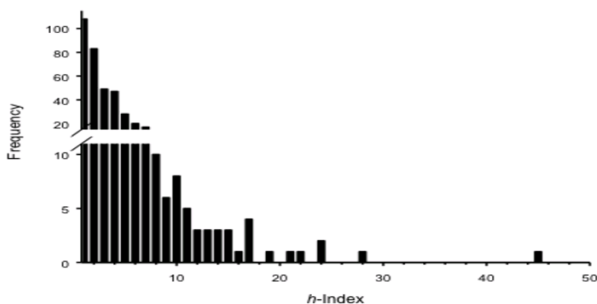


Fig. 2 Distribution of *h*-index scores amongst Plastic Surgeons in Australia and New Zealand.

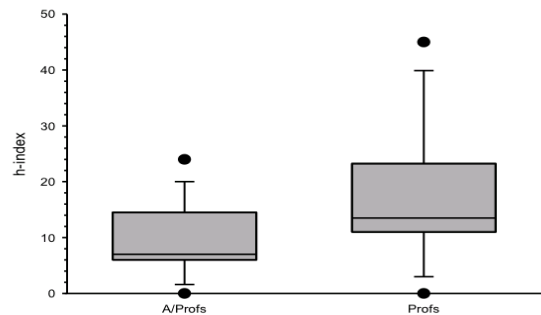


Fig. 3 Distribution of *h*-index scores according to academic rank (Associate Professors and Professors).

Discussion

Plastic Surgeons from Australia and New Zealand have been actively involved in clinical and scientific advances since the specialty's genesis. Previous bibliometric studies have shown that local researchers have been at the forefront of many of the major advances in our field, both in plastic surgical publications generally, as well as in various sub-specialty areas.⁴⁻⁸

A previous study by Rymer *et al.*¹³ of publications in the 10 highest-ranking Plastic Surgery journals over a 5-year period demonstrated that Australian researchers were ranked 7th in terms of overall publications. The overall quality of research was noted to be high (ranked third for mean impact factor), as was the per capita research production (second for publications per million of population). The quality of research has been confirmed in other studies.¹⁴

Australian surgeons have been at the forefront of developments in reconstructive microsurgery, and this is reflected in citation analyses of microsurgical publications.^{4,15} Australian researchers produced the second-highest number of publications, as well as the highest-ranked author and institution.

More recently, we have observed a significant contribution of local surgeons to the international burns literature. This has been primarily through the dedicated tertiary burns units in Adelaide, Melbourne, Perth, and Sydney. Australian research is featured in a citation analysis of the most influential papers in burns,⁵ as well as similar studies in rhinoplasty, cleft lip and palate, and aesthetic surgery.⁶⁻⁸

The data collected and presented understates the extent of research that Australian and New Zealand surgeons participate in, as many publications appear in journals other than those that we have assessed. A significant volume of research has been published in other sub-specialty journals (particularly breast, head and neck, and craniofacial), as well as biomedical science journals.

The analysis of the *h*-index attempts to address this shortcoming; by this measure, there are several researchers across Australia and New Zealand who have produced a substantial body of high-quality research across their careers.

The *h*-index is a measure of an individual's research production.¹⁶ It records both the volume and significance of publications, and has been previously shown to correlate to academic rank in Plastic Surgery.^{17, 18} A study of academic Plastic Surgeons in the United States demonstrated a mean *h*-index of 9.10 for associate professors, and 15.30 for professors;¹⁸ results for local surgeons likewise correlate with these figures.

Multiple different measures of research production have been previously used, including total numbers of publications (with or without weighting according to impact factors), research grants, and publication/citation indices (*h*-index, as well as variants such as *g*-index and

contemporary *h*-index). We have attempted to give a snapshot of Plastic surgical research in Australia and New Zealand, and the metrics that we have applied are publications in Plastic Surgery-specific journals, and lifetime *h*-index. We feel that, in combination, these measures give a representative view of past and present research in our field.

Conclusion

Australian and New Zealand Plastic Surgeons continue to be actively involved in world-class research and innovation. The volume and quantity of research produced supports the development of an *Australasian Journal of Plastic Surgery*.

Acknowledgements

Thank you to Vicky Tobin for her assistance with analysing data and creating graphs.

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