

Canadian University Publications 2006

HIGHLIGHTS

Publication Output – All Sectors¹ International Overview

- ◆ Between 1999-2002, Canada ranked 6th in world scientific publication output. In 2003 and 2004, Canada dropped to 7th place, below China.

Leaps and Bounds
 China was on the move during this time and jumped from 12th position in 1999 to 6th position in 2003 and 2004, displacing Canada from 6th place to 7th.
- ◆ Canadian researchers published an average of 30,433 papers per year. The average number of world publications was 661,742 per year.
- ◆ Canada maintained a 4.6% share of the world's publishing output during this period.
- ◆ In 2004, on a per capita output basis, Canada tied for 4th in the world with Australia publishing 0.98 papers per 1,000 people. Sweden (1.46), Netherlands (1.10) and United Kingdom (1.00) placed ahead of Canada.

Although the United States ranked 1st in total publication output, on a per capita basis in 2004, the US ranked behind Canada at 0.79 papers per 1000 people.
- ◆ Total Canadian output increased by 4.0% from 1999-2004 (compared to a world gain of only 3.3%). Publications increased from 30,004 to 31,209. Germany (-2.0%), United Kingdom (-3.5%), Japan (-4.1%) and France (-6.0%) all had declines in publication output, while the United States increased its number of publications by 1.8% between 1999-2004.

Leaps and Bounds
 Between 1999-2004, Asian countries China, South Korea and India increased their publishing output by 127.8%, 69.8% and 23.0% respectively.
- ◆ Canada consistently ranked 9th between 1999 and 2004 in Natural Sciences and Engineering (NSE) publications. Output increased 9.2% from 12,773 papers in 1999 to 13,951 papers in 2004.

Leaps and Bounds
 China moved up in rank for NSE publications from 8th position in 1999 to 3rd in 2004, growing 123.2% from 13,016 articles in 1999 to 29,051 in 2004.
- ◆ Globally, Canada maintained a 6th place rank in Health Sciences publications over the period with an average of 13,402 papers per year.

¹ Includes publications from universities/affiliated hospitals, industry, government and other.

- ◆ In both Social Sciences and Humanities, Canada ranked 3rd in publication output behind the United States and United Kingdom.

Publication Output – National Universities Overview

- ◆ University researchers are responsible for 90% of Canada's scientific publishing output. Between 1999-2004, the number of published articles among universities grew from 26,909 in 1999 to 27,886 in 2004 – a growth of 3.6% for the 69 universities represented.

By University Type

Sixteen Medical/Doctoral universities increased their publication output between 1999-2004 by only 2.1% from 21,966 papers in 1999 to 22,432 in 2004. Thirteen Comprehensive universities had a strong growth of 18.0% during the period increasing their papers from 4,638 in 1999 to 5,223 in 2004. Finally, the 40 Undergraduate universities had the strongest growth (25.1%) increasing their output from 1,488 in 1999 to 1,861 in 2004.

- ◆ During 1999-2004, Canada's university sector represented 4.1% of world publishing output. By field, Canadian universities publications' share of world for: NSE publishing output was 3.4%, Health Sciences 4.6%, Social Sciences 5.7% and Humanities was 6.1%.
- ◆ Between 1999-2004, university NSE and Humanities publications grew 9.7% and 5.5% respectively. Publishing efforts in both Health Sciences (-0.8%) and Social Sciences (-0.7%) decreased slightly during this time period.

- ◆ NSE publications accounted for 40.5%, Health Sciences 46.4%, Social Sciences 8.8% and Humanities 4.2% of all Canadian university publications.

By University Type

Medical/Doctoral universities accounted for 81.1% of total output at Canadian universities between 1999-2004, Comprehensive 18.0% and Undergraduate 6.1%.

Publication Intensity

- ◆ Overall publication intensity (publications per full-time faculty) averaged 0.85 papers per researcher per year between 1999-2004.
- ◆ The average publication intensity during the period was: NSE 1.18 papers per year per faculty; Health Sciences 2.25; Social Sciences 0.22 and Humanities 0.19.

By University Type

Medical/Doctoral universities had an average publication intensity of 1.14, Comprehensive universities 0.69 and Undergraduate universities had an average of 0.29 papers per year between 1999-2004.

- ◆ Between 1999-2004, 8 of the 16 Medical/Doctoral universities achieved a publication intensity equal to or above the tier average of 1.14 for the period. Four out of 11 full-service universities at the Comprehensive level had a publication intensity of 0.69 or higher and 14 of the 29 full-service Undergraduate universities had a publication intensity of 0.29 or higher.

Publication Impact – Average Relative Impact Factor (ARIF)² – All Sectors³ International Overview

- ◆ Canada tied for 4th in the world with the United Kingdom in terms of overall quality of publication (ARIF 1.08). The US (1.21), Switzerland (1.15) and Netherlands (1.13) scored higher than Canada.
- ◆ For the total period between 1999-2004, Canada’s NSE publications had an ARIF of 1.07 and ranked 7th behind United States (1.21), Switzerland (1.17), Netherlands (1.17), United Kingdom (1.09), Sweden (1.09) and Germany (1.08).
- ◆ Canadian publications in the Health Sciences field scored an ARIF of 1.09 with only United States (1.21), Switzerland (1.15) and the Netherlands (1.11) receiving higher scores.
- ◆ In the Social Sciences, Canada had an ARIF of 1.05, again in 4th place behind the United States (1.21), the Netherlands (1.09) and United Kingdom (1.06).

Although China’s quantity of publications is increasing rapidly, their ARIF was well below the world average at 0.83 for the period.

² Publication impact (ARIF) is a measure of quality. It measures the impact of publications from a given group (i.e., countries, institutions, fields, etc.) by comparing it to the impact of the world baseline 1.00. When the ARIF is higher than 1.00, then publications have a perceived impact above the world average, and vice versa.

³ Includes publications from universities/affiliated hospitals, industry, government and other.

Publication Impact – Average Relative Impact Factor (ARIF) – National Universities Overview

- ◆ Canadian universities’ overall ARIF across the NSE, Health Sciences and Social Sciences fields remained stable at 1.11 for 5 out of the 6 years of the study.
- ◆ Twenty-eight of the 69 universities scored equal to or above, the world average of 1.00.
- ◆ By field, across all the universities, Health Sciences had the highest ARIF score of 1.12, followed by NSE publications at 1.11 and Social Sciences achieved a score of 1.06 for the 6-year period. (The Humanities field is not included in the ARIF analysis.)

By University Type
 Medical/Doctoral universities had an ARIF of 1.11, Comprehensive universities of 1.05 and Undergraduate universities had an ARIF of 0.92 between 1999-2004.

Publication Efficiency

- ◆ Publication efficiency is a new indicator to measure the efficiency of university researchers at different institutions, in turning research income received into publications. In 2001, at the national level on

By University Type
 Between 1999-2004, the overall national cost of producing a publication was \$111,300. At Medical/Doctoral universities the cost was \$111,700, at Comprehensive universities it was \$88,200 and at Undergraduate it was \$76,300.

average, \$84,000 was required to produce each of the 26,572 publications⁴. In 2004, the research income required reached \$137,000 per paper.

Publication Effectiveness

- ◆ Publication effectiveness is another new indicator that brings together each university's efficiency (cost advantage) with its impact (quality advantage) in relation to similar institutions. For 2004, 9 out of the 16 Medical/Doctoral universities achieved an effectiveness score equal to or higher than the baseline of 1.00. Seven full-service Comprehensive universities had a score of 1.00 or higher and among 17 full-service Undergraduate universities (with \$1 million or more in research income and 40 or more publications), 10 universities scored above the average of 1.00.

⁴ The calculations are offset by approximately 2 years. Year 1 funding is compared with Year 3 publications, to account for the delay in conducting and publishing research.

