



Service Bulletin

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To order Statistics Canada publications, please call our National toll-free line 1 800 267-6677 or internet: infostats@statcan.ca**Estimates of total spending on research and development in the health field in Canada, 1988 to 2003**

Expenditures on Health R&D are growing as a percentage of Gross Domestic Expenditures on Research and Development (GERD). Between the years 1996 and 2000, research and development expenditures in the health field represented approximately 18% of total R&D expenditures in Canada. In the last three years, this percentage has grown to 20% (2001), 22% (2002) and 23% (2003 preliminary estimates). This service bulletin presents details of expenditures on Health R&D performance and funding.

Highlights

- ▶ In 2003, the preliminary estimates of the gross expenditures on health research and development in Canada was \$5.1 billion, an increase of 7.0% over 2002. Research and development in the health field has gained importance in Canada in the past several years. In 1996, \$84 per person was spent on research in the health field. Preliminary estimates for 2003 indicate that \$161 per person will be spent (table 1).
- ▶ The largest performer of Health GERD is the higher education sector. This sector includes Canadian universities and teaching hospitals. In 2003, it performed 57% (\$2.9 billion) of total Health GERD. The second largest performer is the business enterprise sector representing 38% (\$1.9 billion) of Health GERD.
- ▶ The largest funder of Health GERD is the business enterprise sector with a total of \$1.5 billion in 2003. In 2001 and 2002, the business enterprise sector showed the largest increase in funding (\$209 million and \$99 million respectively). In 2001, the federal government sector showed an increase of \$168 million which included a one-time grant given to the universities for "indirect costs" of research activities.
- ▶ Total Canadian R&D expenditures (GERD) were estimated to be \$22.4 billion in 2003. Health GERD represents 23% of this total. Over the last ten years, the average increase per year of the Health GERD has been 10% which is higher than the average annual 6% growth rate of GERD for the same period.

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- ▶ Table 3 examines the data historically. Health GERD data by performing sector reflects an average annual increase of 15% in the business sector, 12% in the federal government sector and 8% in the higher education sector over the past 10 years. The major funders of Health GERD; business enterprises and higher education sectors respectively show an 11% and 6% average annual increase over the same period. Federal government sector funding (average 10 year growth rate being 10%) in 1999 begins to show the infusion of the Canada Foundation for Innovation dollars.
- ▶ When examining regional distribution of Health GERD, data are only available for the higher education sector (table 4). We see that Ontario and Quebec are the provinces where most activities are taking place. This is due primarily to the large number of universities and teaching hospitals in these two provinces.

Definitions:

R&D is defined as creative work undertaken on a systematic basis to increase the stock of scientific and technical knowledge and to use this knowledge in new applications. Expenditures on R&D are an important indicator of the effort devoted to creative activity in science and technology.

Gross Domestic Expenditures on Research and Development (GERD) represent all R&D performed in a country's national territory during a given year. The GERD includes R&D performed within a country and funded from abroad but excludes payments sent abroad for R&D performed in other countries.

Methodology:

Federal government sector: The Health GERD figures include scientific activities aimed at protecting, promoting and restoring human health broadly interpreted to include health aspects of nutrition and food hygiene. They range from preventative medicine, including all aspects of medical and surgical treatment, both for individuals and groups, and the provision of hospital and home care, to social medicine and pediatric and geriatric research.

Federal government R&D expenditures in the health field from 1988 until 2003^p are derived from the federal survey of government departments and agencies. Data were collected from responses to a question on health as a socio-economic objective for R&D spending. Federal government data are published in Catalogue No. 88-204-XIE.

Provincial government: R&D expenditures in the health field are based on values from provincial science surveys which identify intramural R&D expenditures in the health socio-economic objective field.

Business enterprise sector: The Pharmaceutical and medicine manufacturing industry is the most significant source of health R&D in the Business enterprise sector. However, since industries are classified by NAICS, which is based on the principal source of revenue, pharmaceutical R&D is also found in Wholesale trade and Scientific research and development services. NAICS code 414510 identify the pharmaceutical industries within Wholesale trade. In the Scientific research and development services industry, major performers of pharmaceutical R&D were identified on a case by case basis.

The higher education sector: Health R&D statistics are derived from Statistics Canada's revised higher education R&D estimates (STC Catalogue 88-001 Vol. 28 No. 1) which identify R&D performed in the health field. The revised estimates are based on the assumption that the total R&D expenditures are equal to the sum of: a) sponsored research expenditures (including all teaching hospitals); b) indirect expenditures on sponsored research; c) a value for the fraction of faculty members' time assumed to be devoted to sponsored and non-sponsored research; and d) indirect expenditures related to faculty members' time on research.

Due to the nature of the estimation system for Higher Education R&D (HERD) statistics, higher education is the only sector of performance where a regional breakdown of health R&D is available (see Table 4).

Private non-profit sector: Values used for estimating health R&D expenditures in the private non-profit (PNP) sector are those identified as health-related in survey responses. See Volume 28, No. 4 of this publication for further information.

Table 1. Gross domestic expenditures on R&D in the health field, compared to total GERD, 1988 to 2003

Year	Health R&D	Population ¹	Health R&D/Capita	GERD ²	Health R&D/GERD
	in millions of dollars	in thousands	dollars	in millions of dollars	percent
1988	1,221	26,795	46	9,045	13.5
1989	1,365	27,282	50	9,516	14.3
1990	1,551	27,698	56	10,260	15.1
1991	1,665	28,031	59	10,767	15.5
1992	1,783	28,367	63	11,338	15.7
1993	2,006	28,682	70	12,184	16.5
1994	2,105	28,999	73	13,342	15.8
1995	2,324	29,302	79	13,754	16.9
1996 ^r	2,482	29,611	84	13,816	18.0
1997 ^r	2,669	29,907	89	14,636	18.2
1998 ^r	2,913	30,157	97	16,077	18.1
1999 ^r	3,208	30,404	106	17,631	18.2
2000 ^r	3,738	30,689	122	20,359	18.4
2001 ^r	4,403	31,021	142	22,116	19.9
2002 ^r	4,748	31,362	151	21,704	21.9
2003 ^p	5,082	31,630	161	22,450	22.6

1. CANSIM, table 051-0001.
 2. Estimates of Canadian Research and Development Expenditures (GERD), Canada 1992 to 2003 and by Province 1992 to 2001, no. 88F0006XIE No.003, January 2004. CANSIM, table 358-0001.

Chart 1. Gross domestic expenditures on R&D in the health field, compared to total GERD, 1988 to 2003

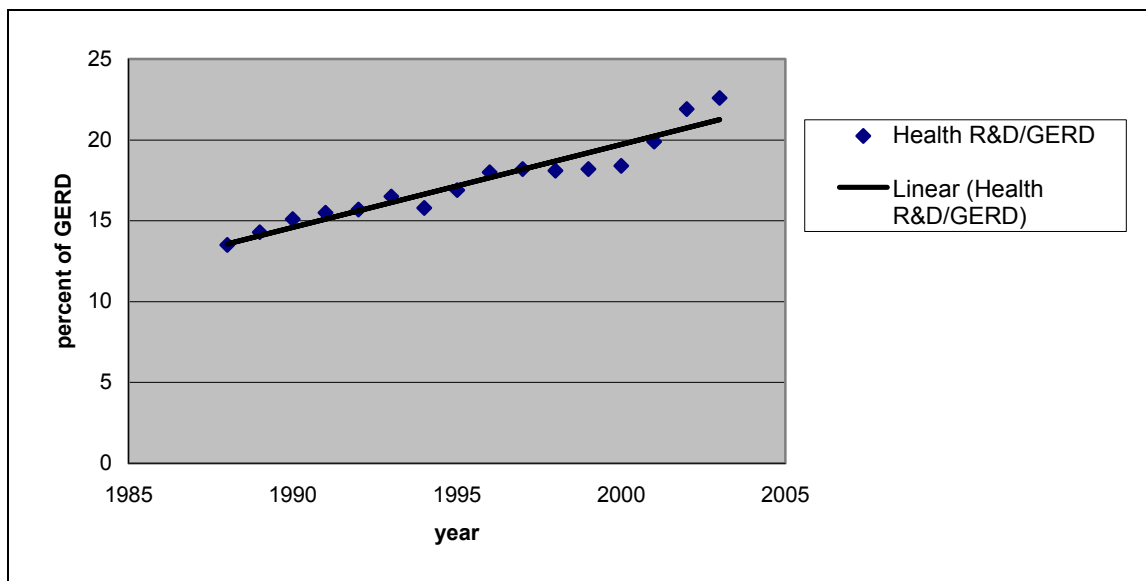


Table 2. Gross domestic expenditures on R&D in the health field, 2003						
Funding sector	Performing sector					Total
	Federal government	Provincial government	Business enterprises	Higher education ¹	Private non-profit organizations	
in millions of dollars						
Federal government	163	0	11	676	3	853
Provincial government	0	46	6	256	14	322
Business enterprise	0	0	1,247	283	8	1,538
Higher education ¹	0	0	0	1,284	0	1,284
Private non-profit organizations	0	0	0	373	15	388
Foreign	0	0	655	41	1	697
Total	163	46	1,919	2,913	41	5,082

1. Includes teaching hospitals

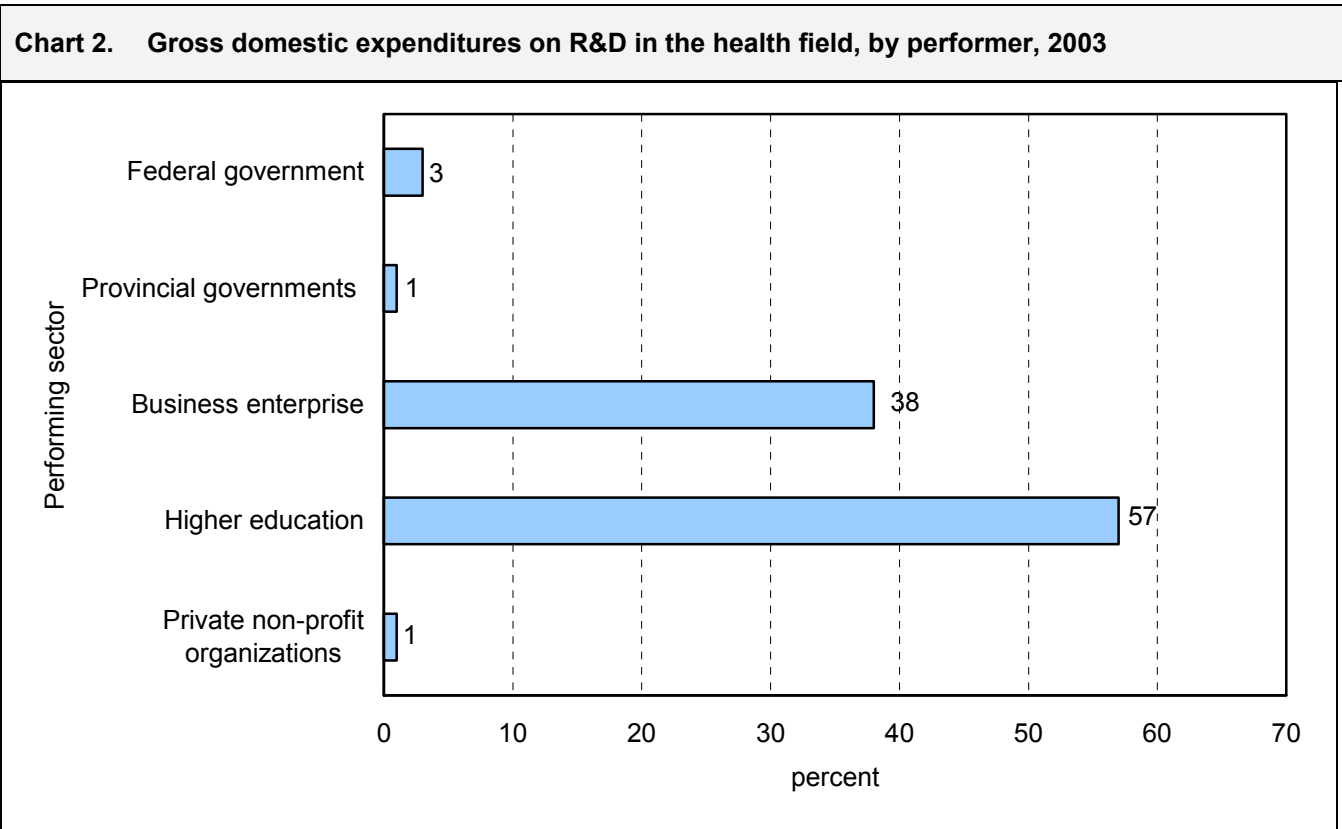


Table 3. Gross domestic expenditures on R&D in the health field, by performing sector and funding sector, 1988 to 2003

Year	Federal government	Provincial government	Business enterprise	Higher education ¹	Private non-profit organizations	Foreign	Total
in millions of dollars							
Performing sector							
1988	41	17	196	895	72	...	1,221
1989	50	22	233	980	80	...	1,365
1990	64	26	321	1,049	91	...	1,551
1991	55	29	324	1,156	101	...	1,665
1992	56	33	405	1,229	60	...	1,783
1993	53	29	490	1,367	67	...	2,006
1994	57	31	561	1,382	74	...	2,105
1995	63	33	721	1,428	79	...	2,324
1996	76	32	867	1,430	77	...	2,482
1997	78	32	971	1,516	72	...	2,669
1998 ^f	87	36	1,095	1,628	67	...	2,913
1999 ^f	103	30	1,204	1,823	48	...	3,208
2000 ^f	116	40	1,435	2,103	44	...	3,738
2001 ^f	152	40	1,737	2,434	40	...	4,403
2002 ^f	160	42	1,857	2,649	40	...	4,748
2003 ^p	163	46	1,919	2,913	41	...	5,082
Funding sector							
1988	255	95	198	500	138	35	1,221
1989	282	129	251	532	143	28	1,365
1990	334	145	333	558	152	29	1,551
1991	322	147	367	616	173	40	1,665
1992	317	149	442	670	138	67	1,783
1993	351	146	533	713	178	85	2,006
1994	354	148	581	721	200	101	2,105
1995	373	154	667	753	206	171	2,324
1996 ^f	347	144	737	754	239	261	2,482
1997	354	168	826	786	245	290	2,669
1998 ^f	382	172	920	864	244	331	2,913
1999 ^f	478	194	979	907	242	408	3,208
2000 ^f	561	231	1,162	999	285	500	3,738
2001 ^f	729	271	1,371	1,074	330	628	4,403
2002 ^f	789	295	1,470	1,168	354	672	4,748
2003 ^p	853	322	1,538	1,284	388	697	5,082

1. Includes teaching hospitals.

Table 4. Higher education sector GERD in the health field by funder and province, 2001							
Province	Federal government	Provincial government	Business enterprise	Higher education ¹	Private non-profit organizations	Foreign	Total
in millions of dollars							
Newfoundland and Labrador	4.2	1.0	2.2	15.8	1.1	1.1	25.4
Prince Edward Island	0.4	0.2	0.0	0.7	0.0	0.0	1.3
Nova Scotia	16.0	1.6	14.3	38.3	12.8	0.4	83.4
New Brunswick	1.5	0.5	0.0	5.5	0.0	0.2	7.7
Quebec	189.8	57.9	61.7	341.3	82.9	7.9	741.5
Ontario	202.5	87.4	113.0	427.4	143.1	17.0	990.4
Manitoba	17.3	4.4	4.2	33.5	13.5	1.1	74.0
Saskatchewan	14.9	12.7	0.0	31.7	8.3	0.0	67.6
Alberta	68.7	37.6	26.2	110.5	29.0	2.5	274.5
British Columbia	48.8	10.3	14.0	70.0	21.6	3.4	168.1
Canada	564.1	213.6	235.6	1,074.7	312.3	33.6	2,433.9

1. Includes teaching hospitals.

Table 5. Provincial indicators, 2001			
Province	Population ¹	Health R&D in the higher education sector	Health R&D in the higher education sector / capita
	in thousands	in millions of dollars	in dollars
Newfoundland and Labrador	522	25	48
Prince Edward Island	137	1	7
Nova Scotia	932	83	89
New Brunswick	750	8	11
Quebec	7,397	742	100
Ontario	11,898	990	83
Manitoba	1,151	74	64
Saskatchewan	1,000	68	68
Alberta	3,057	275	90
British Columbia	4,078	168	41
Canada²	31,021	2,434	79

1. CANSIM, table 051-0001.

2. Includes Nunavut, the Northwest Territories and Yukon.

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^p preliminary
- ^r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- F too unreliable to be published

This publication was prepared by **Lorraine Chapman** under the direction of **Janet Thompson**, Subject Matter Manager, Science and Innovation Surveys section, Science, Innovation and Electronic Information Division.

<http://www.statcan.ca/english/IPS/Data/88-001XIE.htm>

Current publications of the Science and Innovation Surveys section include:

Industrial Research and Development, 2003 Intentions (with 2002 preliminary estimates and 2001 actual expenditures) Catalogue No. 88-202-XIE, annual. It presents statistics on research and development (R&D) activities performed and funded by Canadian business enterprises. The report covers current and capital expenditures on R&D, R&D as a percent of performing company revenues, R&D expenditures by province, the company's country of control, personnel engaged in R&D and payments for technological services.

<http://www.statcan.ca/english/IPS/Data/88-202XIE.htm>

Federal Science Activities, 2002-2003, Catalogue No. 88-204-XIE, annual. It presents statistics on the federal government's activities in science and technology (S&T). It covers expenditures and person-years by type of science, performing sectors, provinces, federal departments and agencies.

<http://www.statcan.ca/english/IPS/Data/88-204XIE.htm>

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