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Estimation of research and development expenditures in the higher education sector, 2004/2005

The higher education sector is composed of "all universities, colleges of technology and other institutes of post-secondary education, whatever their source of finance or legal status. It also includes all research institutes, experimental stations and clinics operating under the direct control of, or administered by, or associated with higher education establishments.¹

Highlights

- ▶ In 2004/2005, estimates of higher education research and development (HERD) expenditures amounted to \$9 billion. This represents an increase of 10.5% over the revised 2003/2004 estimates.
- ▶ This growth is due to increase funding from the higher education sector, the federal government, and private non-profit organizations.
- ▶ The health (+14.3%) and social science (+11.1%) fields benefited most from this increased funding. Other natural sciences also registered 6.9% growth in funding.
- ▶ A total of \$7.2 billion (80%) was allocated in the natural sciences and engineering (including health sciences)
- ▶ The higher education sector contributed 45% (\$4.1 billion) of the funds for research and development (R&D). The main external funders were the federal government (26%), provincial governments (12%), business enterprises (8%) and private non-profit organizations (8%).
- ▶ The federal government's contribution to R&D spending in the higher education sector increased by 7.1% over 2003/2004. However, its share of funding for R&D in the higher education dropped marginally from 27% in 2003/2004 to 26% in 2004/2005.
- ▶ Health sciences and other natural sciences account for 84% of the federal funding for R&D in higher education. Given the distribution of R&D funds to universities, the largest share of these funds went to universities in Ontario and Quebec. This is mainly due to the fact that 59% of the universities are located in these two provinces.

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- ▶ Ontario and Quebec accounted for 67% of federal funds and 70% of the total R&D expenditures. On the other hand, the Atlantic provinces together accounted for only 6% of the federal funds and 6% of total expenditures on R&D in higher education.

The higher education sector R&D performance figures are now estimated using a revised technique which was developed in 2000 and first applied to the 1998-99 data. It assumes that the total expenditures on HERD are equal to the sum of: a) sponsored research, available from the Canadian Association of University Business Officers (CAUBO) survey, b) an estimate of indirect expenditures² on sponsored research, c) a value for the fraction of faculty time devoted to research, d) an estimate of indirect expenditures related to faculty time on research, and e) teaching hospitals data not included in the CAUBO survey.

The one-time grant to universities awarded by the federal government to assist in indirect costs associated with research activities taking place at the universities is included in the HERD (\$203 million in 2001-02 and \$21 million in 2002-03). In 2003-04, the indirect costs grant for R&D in universities became an annual payment. The estimation system used to calculate indirect costs on sponsored research (item "b" above) was adjusted to ensure that the source of this payment is the federal government.

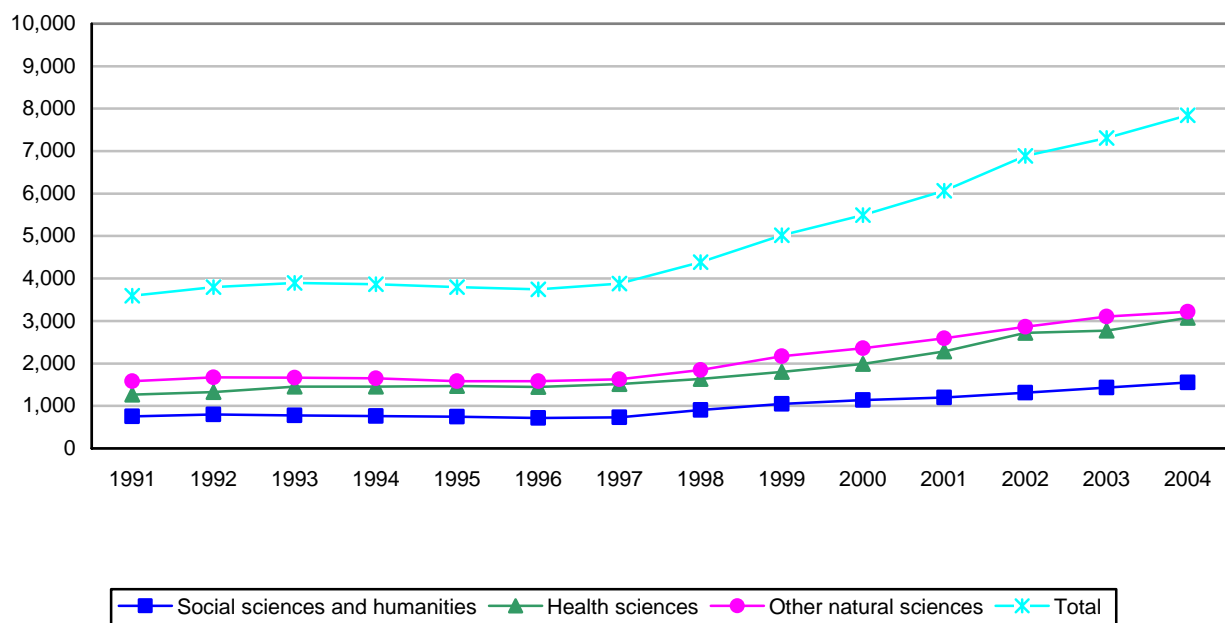
Estimates of the faculty time spent on sponsored and non-sponsored research (item "c" above) for 1998-99 data forward are based upon a Faculty Time Use survey sponsored by the Natural Sciences & Engineering Research Council (NSERC), Social Sciences & Humanities Research Council (SSHRC) and the Canadian Institutes of Health Research (CIHR).

Funds which are sourced to the higher education sector itself, include general university funds (GUF) which flow into university operating budgets from both levels of Canadian governments.

More details on the HERD estimates can be found on the [Definition, data source and methods page](#) of Statistics Canada web site.

HERD by major field of science, 1991/1992 to 2004/2005

millions of 1997 constant dollars³



1. "The Measurement of Scientific and Technical Activities - Frascati Manual," Paris OECD 2002.
 2. A portion of the general operating budget attributed to sponsored research (e.g. library, computing, administration, physical plant, and student services).
 3. CANSIM II, table 384-0036.

Sources of funds	Social sciences and humanities ¹		Health sciences ²		Other natural sciences ³		Total	
	1997 dollars ⁴	current dollars	1997 dollars ⁴	current dollars	1997 dollars ⁴	current dollars	1997 dollars ⁴	current dollars
	millions of dollars							
Federal government	328.9	377.3	762.9	875.0	945.6	1,084.6	2,037.4	2,336.9
Provincial governments	181.2	207.8	271.8	311.7	452.9	519.5	905.8	1,039.0
Business enterprise	21.6	24.8	282.6	324.1	343.8	394.3	647.9	743.1
Higher education	902.6	1,035.3	1,350.9	1,549.5	1,311.5	1,504.3	3,565.0	4,089.0
Private non-profit organizations	114.7	131.6	374.8	429.9	117.6	134.9	607.2	696.5
Foreign	0.0	0.0	33.4	38.3	50.0	57.4	83.4	95.7
Total	1,549.1	1,776.8	3,076.3	3,528.5	3,221.4	3,694.9	7,846.7	9,000.2

1. Social sciences and humanities embrace all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as anthropology, business administration and commerce, communications, criminology, demography, economics, geography, history, languages, literature and linguistics, law, library science, philosophy, political sciences, psychology, religious studies, social work, sociology, and urban and regional studies.

2. Health sciences consist of programmes directed towards the protection and improvement of human health.

3. Other natural sciences consist of disciplines, other than health sciences, concerned with understanding, exploring, developing or utilizing the natural world. Included are engineering, mathematical and physical sciences.

4. CANSIM II, table 384-0036

Year	Federal government	Provincial government	Business enterprise	Higher education	Private non-profit organizations	Foreign	Total
	millions of dollars						
1991/1992	813.3	288.9	229.2	1,731.6	215.2	11.0	3,289.2
1992/1993	848.7	294.2	293.1	1,867.2	196.2	20.1	3,519.5
1993/1994	872.7	312.4	313.9	1,892.1	248.3	20.3	3,659.7
1994/1995	869.8	314.7	296.1	1,913.8	259.2	21.3	3,674.9
1995/1996	854.8	323.2	296.7	1,926.6	265.7	24.2	3,691.2
1996/1997	809.0	297.6	335.6	1,905.5	312.7	36.4	3,696.8
1997/1998	792.7	369.9	381.0	1,971.5	324.5	39.5	3,879.1
1998/1999	862.9	371.6	411.0	2,339.4	335.1	49.5	4,369.5
1999/2000	1,084.6	482.2	460.3	2,648.8	349.2	56.6	5,081.7
2000/2001	1,292.8	587.2	553.4	2,892.1	418.2	49.6	5,793.3
2001/2002	1,586.8	712.0	603.3	2,928.9	509.1	84.1	6,424.2
2002/2003	1,816.7	828.6	643.2	3,461.8	604.5	100.5	7,455.3
2003/2004 ^f	2,181.7	1,018.1	679.1	3,589.3	599.4	75.8	8,143.3
2004/2005	2,336.9	1,039.0	743.1	4,089.0	696.5	95.7	9,000.2

Table 3 Estimates of R&D expenditures in the higher education sector, by source of funds and by province, 2004/2005

Province	Federal government	Provincial government	Business enterprise	Higher education	Private non-profit organizations	Foreign	Total
millions of dollars							
Newfoundland and Labrador	35.1	1.0	16.4	60.2	2.2	0.0	115.0
Prince Edward Island	7.0	0.4	0.8	15.3	0.8	0.0	24.2
Nova Scotia	73.0	7.9	22.7	140.9	21.6	0.0	266.2
New Brunswick	30.9	3.4	4.0	70.4	5.5	0.2	114.3
Quebec	649.9	318.2	180.0	1,109.0	171.4	18.7	2,447.2
Ontario	914.4	391.2	393.9	1,791.6	282.9	61.9	3,835.9
Manitoba	72.1	18.9	16.4	122.7	29.0	1.5	260.6
Saskatchewan	64.7	27.7	18.2	121.6	12.4	0.1	244.6
Alberta	205.3	231.8	59.1	310.1	49.8	5.4	861.5
British Columbia	284.5	38.5	31.7	347.1	120.9	8.0	830.7
Canada	2,336.9	1,039.0	743.1	4,089.0	696.5	95.7	9,000.2

Table 4 Estimates of R&D expenditures in the higher education sector, by province, 1991/1992 to 2004/2005

Year	Province										Canada
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	
millions of dollars											
1991/1992	57.5	5.1	127.5	49.7	1,030.7	1,211.2	113.8	100.7	290.4	302.6	3,289.2
1992/1993	60.5	4.8	121.2	53.2	1,150.4	1,280.1	116.8	103.3	294.7	334.5	3,519.5
1993/1994	60.9	4.4	119.0	52.5	1,163.0	1,422.6	110.7	106.2	296.8	323.6	3,659.7
1994/1995	58.5	3.8	113.2	53.8	1,136.1	1,441.3	114.8	108.2	309.0	336.2	3,674.9
1995/1996	58.4	3.7	117.0	56.2	1,111.5	1,432.7	113.5	113.9	327.8	356.5	3,691.2
1996/1997	56.6	4.2	117.6	56.3	1,099.3	1,456.1	111.3	113.6	328.8	353.0	3,696.8
1997/1998	61.2	5.9	125.0	57.4	1,131.6	1,554.2	108.3	118.9	357.7	358.9	3,879.1
1998/1999	72.0	11.4	164.1	80.4	1,273.8	1,699.7	130.8	138.4	408.1	390.8	4,369.5
1999/2000	78.6	11.4	199.6	89.0	1,532.9	1,908.0	157.6	176.1	490.9	437.6	5,081.7
2000/2001	83.4	15.7	199.9	88.2	1,628.6	2,316.2	189.6	228.2	546.0	497.5	5,793.3
2001/2002	89.4	15.7	208.6	88.2	1,778.5	2,575.9	205.9	235.6	664.9	561.5	6,424.2
2002/2003	94.4	18.7	225.5	98.9	2,074.3	2,995.5	224.5	258.8	727.5	737.2	7,455.3
2003/2004 ^f	114.1	25.2	259.1	117.5	2,345.0	3,187.4	238.7	244.8	826.8	784.6	8,143.3
2004/2005	115.0	24.2	266.2	114.3	2,447.2	3,835.9	260.6	244.6	861.5	830.7	9,000.2

Table 5 Estimates of R&D expenditures in the higher education sector, on social sciences and humanities, by province, 1991/1992 to 2004/2005

Year	Province										Canada
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	
	millions of dollars										
1991/1992	17.2	1.4	26.1	13.2	198.5	265.4	24.8	20.7	59.8	60.3	687.9
1992/1993	15.9	1.3	27.6	13.2	211.3	287.5	25.5	21.2	60.3	74.8	738.6
1993/1994	15.6	1.1	25.1	14.2	216.6	282.6	23.8	21.1	61.3	69.1	730.5
1994/1995	15.6	0.9	23.5	13.9	217.5	278.9	24.2	21.9	58.7	70.4	725.5
1995/1996	15.4	0.9	23.0	13.8	213.5	269.1	24.7	23.8	64.5	76.0	724.7
1996/1997	15.2	1.1	21.3	13.2	204.9	259.6	24.5	23.9	61.1	80.4	705.2
1997/1998	14.7	1.5	21.9	12.8	203.6	285.6	23.8	26.9	62.2	78.7	731.7
1998/1999	16.5	3.5	40.9	25.4	243.9	341.9	33.6	32.6	71.6	93.9	903.8
1999/2000	20.5	3.7	48.1	27.8	296.4	401.0	40.4	36.8	86.2	101.6	1,062.5
2000/2001	19.2	4.5	51.9	29.8	323.6	473.5	43.1	47.6	95.5	113.7	1,202.4
2001/2002	23.8	4.3	48.9	29.7	331.4	515.0	44.7	48.5	107.3	120.9	1,274.5
2002/2003	21.7	5.6	51.3	32.2	396.3	535.1	48.7	51.5	120.7	151.0	1,414.1
2003/2004 ^f	29.3	6.7	58.0	38.0	453.8	603.2	54.0	48.0	143.2	164.6	1,598.8
2004/2005	27.9	6.8	63.7	40.2	486.2	694.8	59.8	46.2	168.8	182.4	1,776.8

Table 6 Estimates of R&D expenditures in the higher education sector, on health sciences, by province, 1991/1992 to 2004/2005

Year	Province										Canada
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	
	millions of dollars										
1991/1992	14.6	0.7	36.6	3.3	401.5	429.1	44.2	26.9	110.7	88.8	1,156.4
1992/1993	13.8	0.5	34.7	3.1	443.6	448.6	46.4	27.3	115.7	95.3	1,229.0
1993/1994	15.3	0.5	39.1	3.6	460.4	561.8	44.2	28.0	120.0	94.0	1,366.9
1994/1995	15.6	0.3	38.8	3.6	458.6	571.4	44.9	27.8	123.7	97.4	1,382.1
1995/1996	15.3	0.3	45.7	4.7	452.5	606.1	43.8	30.4	126.8	102.8	1,428.4
1996/1997	15.0	0.3	46.3	4.6	449.0	614.1	42.7	27.3	130.0	101.1	1,430.4
1997/1998	17.3	0.6	52.8	4.8	457.4	661.6	40.8	31.1	147.3	102.4	1,516.1
1998/1999	21.6	0.6	62.2	6.8	507.8	671.1	45.6	36.1	166.5	109.5	1,627.8
1999/2000	20.1	0.6	71.8	7.1	597.5	706.1	53.8	43.5	199.5	122.5	1,822.5
2000/2001	23.9	1.4	72.6	7.5	633.9	875.6	62.0	57.9	225.0	144.1	2,103.9
2001/2002	25.4	1.3	83.4	7.7	700.2	977.1	74.1	67.6	274.5	171.3	2,382.6
2002/2003	29.7	2.1	88.1	9.2	813.5	1,296.6	81.2	76.4	306.1	252.7	2,955.6
2003/2004 ^f	35.9	3.6	107.3	10.5	877.1	1,314.8	83.1	65.3	330.0	259.2	3,086.8
2004/2005	39.5	3.7	102.9	9.6	900.7	1,693.0	91.6	65.0	314.2	308.3	3,528.5

Table 7 Estimates of R&D expenditures in the higher education sector, on other natural sciences, by province, 1991/1992 to 2004/2005

Year	Province										Canada
	N.L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	
	millions of dollars										
1991/1992	25.8	3.0	64.7	33.2	430.7	516.7	44.8	53.1	120.0	152.9	1,444.9
1992/1993	30.8	3.1	58.9	36.8	495.4	544.0	44.9	54.9	118.7	164.4	1,551.9
1993/1994	30.0	2.8	54.8	34.7	486.0	578.2	42.7	57.1	115.5	160.5	1,562.3
1994/1995	27.3	2.7	50.9	36.2	460.0	591.1	45.6	58.5	126.6	168.3	1,567.2
1995/1996	27.7	2.5	48.3	37.6	445.5	557.6	45.0	59.7	136.5	177.7	1,538.1
1996/1997	26.4	2.8	50.0	38.4	445.4	582.5	44.1	62.4	137.7	171.5	1,561.2
1997/1998	29.2	3.7	50.3	39.7	470.7	607.0	43.7	61.0	148.2	177.8	1,631.4
1998/1999	33.9	7.3	61.0	48.2	522.0	686.7	51.6	69.8	170.0	187.4	1,837.9
1999/2000	38.0	7.2	79.6	54.2	639.0	800.9	63.4	95.8	205.1	213.6	2,196.8
2000/2001	40.2	9.8	75.5	50.9	671.2	967.1	84.5	122.7	225.5	239.6	2,487.0
2001/2002	40.2	10.1	76.2	50.8	746.7	1,083.8	87.0	119.5	283.2	269.6	2,767.1
2002/2003	43.0	11.0	86.1	57.5	864.5	1,163.8	94.6	130.9	300.7	333.5	3,085.6
2003/2004 ^f	48.9	14.9	93.9	69.0	1,014.2	1,269.4	101.5	131.5	353.6	360.8	3,457.7
2004/2005	47.7	13.7	99.6	64.5	1,060.3	1,448.1	109.2	133.4	378.5	340.0	3,694.9

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

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