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Total spending on research and development in Canada, 1990 to 2003^P, and provinces, 1990 to 2001

Gross domestic expenditures on research and development (GERD) represents total R&D expenditures performed in a country's national territory during a given year. GERD includes R&D performed within a country and funded from abroad but excludes payments sent abroad for R&D performed in other countries.

Highlights

- ▶ After the first decrease of Gross Domestic Expenditures on Research and Development (GERD) ever reported for 2002, the 2003 preliminary estimates indicate a recovery. For 2003, GERD is expected to reach \$22.5 billion, an increase of 3.4% over 2002 (\$21.7 billion) and 1.5% over 2001 (\$22.1 billion). Respondents made their forecasts in late 2002 and early 2003.
- ▶ On the performance of R&D, the higher education sector is responsible for 89% of the increase in 2003 GERD. The business sector R&D performance is still below the 2000 level and accounts for 9% of the increase of GERD. The federal government is expected to perform 2.2% less R&D in 2003 than in 2002.
- ▶ The increase in funding for GERD is lead by the higher education sector with 43.8% of the increase, followed by the federal government (17.2%), the business sector (16.2%) and the provinces (11.7%).
- ▶ The intensity of R&D performance, as measured by the ratio of GERD over Gross Domestic Product (GDP), is expected to reach 1.88% in 2002, a decrease from the 2.0% observed in 2001.
- ▶ In 2001, 74% of Canadian R&D was performed in Ontario and Quebec. This level of concentration has been constant for the last five years. Since no attempt is made to forecast or estimate provincial expenditures, only actual expenditures are presented. Thus provincial data are available only to 2001.

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Summary statistics for GERD and GERD/GDP ratios are given in Table 1. The figures for 2003 are spending estimates, whereas the 2002 figures are revised preliminary actual expenditures.

TABLE 1. Gross domestic expenditures on R&D (GERD) in current dollars, in 1997 dollars and in percentage of the gross domestic product, 1990 to 2003

Year	GERD	GDP ¹	GERD/GDP	GDP implicit price index ²	GERD ³
	in millions of dollars		%	%	in millions of 1997 dollars
1990	10,260	679,921	1.51	88.8	11,554
1991	10,770	685,367	1.57	91.5	11,770
1992	11,338	700,480	1.62	92.7	12,231
1993	12,184	727,184	1.68	94.0	12,962
1994	13,342	770,873	1.73	95.1	14,029
1995	13,754	810,426	1.70	97.2	14,150
1996 ^f	13,816	836,864	1.65	98.8	13,984
1997 ^f	14,636	882,733	1.66	100.0	14,636
1998 ^f	16,077	914,973	1.76	99.6	16,142
1999 ^f	17,631	982,441	1.79	101.3	17,405
2000 ^f	20,359	1,075,566	1.89	105.4	19,316
2001	22,116	1,107,459	2.00	106.4	20,786
2002 ^p	21,704	1,154,949	1.88	107.5	20,190
2003 ^p	22,450	..	..	..	..

¹ CANSIM II Table 380-0002.

² CANSIM II Table 384-0036.

³ GERD data are deflated by the GDP implicit price index.

Direct international comparisons of the levels of effort devoted to R&D can be confounded by constantly fluctuating exchange rates among international currencies and changes in the relative costs of human resources and financial imports into the R&D programs of different nations. One of the methods the OECD employs to circumvent these difficulties is to express the GERD as a ratio of GDP. This ratio has become a standard OECD tool for international comparisons and also a convenient summary statistic. However, as a summary statistic, it is influenced by the economic structure and by the propensity to perform R&D in particular sectors. Both change from country to country.

Table 2 presents the GERD/GDP ratios for selected OECD countries. Most of these countries have a higher ratio than Canada. In part, this is due to greater defence R&D expenditures in some countries.

TABLE 2. Gross domestic expenditures on R&D (GERD) as a percentage of gross domestic product for selected OECD countries

Country	1997	1998	1999	2000	2001	2002
Canada	1.66	1.76	1.79	1.89	2.00	1.88
France	2.22	2.17	2.18	2.18	2.20 ^p	..
Germany	2.29	2.31 ^e	2.44	2.49	2.49	2.50
Italy	1.05	1.07	1.04	1.07	..	..
Japan	2.83	2.94	2.94	2.98	3.09	..
Sweden ¹	3.54	..	3.65	..	4.27	..
U.K.	1.81	1.80	1.88	1.85	1.90	..
U.S.A. ²	2.58	2.60	2.65	2.72	2.82	2.82

¹ Underestimated or based on underestimated data.

² Excludes most or all capital expenditures.

Source: Main Science and Technology Indicators, No. 1, DSTI, OECD, 2003

In Table 3, GERD is presented historically by both the performing and the funding sectors.

TABLE 3. Gross domestic expenditures on R&D (GERD), by performing sector and funding sector, 1990 to 2003

Year	Federal government	Provincial governments	Business enterprise	Higher education	Private non-profit organizations	Foreign	Total
in millions of dollars							
Performing sector:							
1990	1,654	302	5,169	3,033	102	...	10,260
1991	1,685	328	5,355	3,292	110	...	10,770
1992	1,716	293	5,742 ^e	3,519	68	...	11,338
1993	1,757	269	6,424	3,660	74	...	12,184
1994	1,754	260	7,567 ^e	3,675	86	...	13,342
1995	1,727	254	7,991	3,691	91	...	13,754
1996 ^r	1,792	242	7,996	3,697	89	...	13,816
1997 ^r	1,720	214	8,741	3,879	82	...	14,636
1998 ^r	1,743	216	9,671	4,370	77	...	16,077
1999 ^r	1,859	233	10,394	5,082	63	...	17,631
2000 ^r	2,080	255	12,175	5,792	57	...	20,359
2001	2,103	307	13,179	6,475	52	...	22,116
2002 ^p	2,224	322	11,985	7,120	53	...	21,704
2003 ^p	2,174	331	12,060	7,831	54	...	22,450
Funding sector:							
1990	2,859	641	3,960	1,618	233	949	10,260
1991	2,946	696	4,113	1,735	267	1,013	10,770
1992	3,109	644	4,445 ^e	1,867	224	1,049	11,338
1993	3,156	665	5,025	1,892	276	1,170	12,184
1994	3,095	663	5,874 ^e	1,914	298	1,498	13,342
1995	2,989	652	6,288	1,926	309	1,590	13,754
1996 ^r	2,814	629	6,396	1,905	358	1,714	13,816
1997 ^r	2,814	658	7,032	1,971	367	1,794	14,636
1998 ^r	2,830	639	7,344	2,339	372	2,553	16,077
1999 ^r	3,216	770	7,913	2,649	380	2,703	17,631
2000 ^r	3,560	879	8,979	2,891	445	3,605	20,359
2001	3,997	1,089	10,672	2,979	533	2,846	22,116
2002 ^p	4,240	1,169	9,831	3,276	584	2,604	21,704
2003 ^p	4,368	1,256	9,952	3,603	641	2,630	22,450

GERD by performing sector and funding sector, 2003
(in millions of dollars)

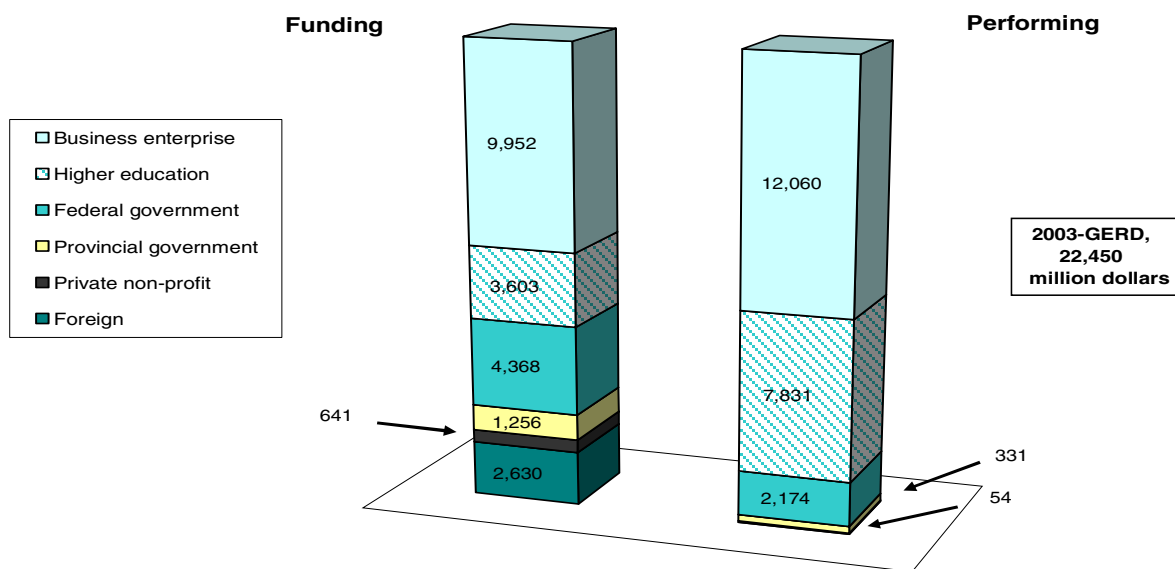


TABLE 4. Provincial background, 2001

Province	Provincial gross domestic product ¹ (PGDP)		Gross domestic expenditures on research and development (GERD) [*]		Population ²		GERD/PGDP	GERD per capita
	(\$000,000)	%	(\$000,000)	%	(000)	%	ratio	dollars
Newfoundland and Labrador	14,196	1	142	1	523	2	1.0	272
Prince Edward Island	3,474	0	35	0	137	0	1.0	255
Nova Scotia	26,070	2	365	2	933	3	1.4	391
New Brunswick	20,772	2	154	1	750	2	0.7	205
Quebec	232,592	21	6,159	28	7,392	24	2.6	833
Ontario	452,923	41	10,297	46	11,866	38	2.3	868
Manitoba	35,294	3	453	2	1,150	4	1.3	394
Saskatchewan	33,580	3	391	2	1,001	3	1.2	391
Alberta	151,173	14	1,511	7	3,050	10	1.0	495
British Columbia	132,050	12	1,679	7	4,073	13	1.3	412
National Capital Region								
Quebec	..		41	0	..		..	..
Ontario	..		885	4	..		..	..
Canada³	1,107,459	100	22,116	100	30,974	100	2.0	714

¹ CANSIM II, Table 384-0002.

² CANSIM II, Table 051-0005.

³ Includes the Yukon, Northwest Territories and Nunavut.

* Quebec and Ontario figures exclude federal government expenditures performed in the National Capital Region.

Estimates of R&D activities by region may be easily misunderstood. For example, the financial data are identified with the region of the physical location of R&D unit. It would be wrong to assume all of the expenditures of a unit are spent in the region of location. Supplies and equipment can be purchased from other regions or countries. Furthermore, in cases such as the National Capital Region, labour moves freely between Québec and Ontario so that even wages and salaries paid by a unit are partly spent outside the area of location.

Expenditures for R&D performed by the federal government in the National Capital Region (NCR) are excluded from the provincial totals and are reported separately. The NCR is, in effect, treated as a separate entity. However, these expenditures, distributed geographically, are presented in Table 10.

TABLE 5. Provincial distribution of the GERD, 1990 to 2001

Year	N.-L.	P.E.I.	N.S.	N.B.	Que.*	Ont.*	Man.	Sask.	Alta	B.C.	Subtotal Canada ¹	NCR	Total Canada ¹
in millions of dollars													
1990	103	16	236	134	2,594	4,444	263	201	781	772	9,549	711	10,260
1991	106	16	240	121	2,863	4,616	284	216	789	782	10,034	733	10,767
1992	110	14	233	122	3,113	4,818	281	235	779	879	10,585	753	11,338
1993	111	17	245	130	3,295	5,331	296	233	834	916	11,410	774	12,184
1994	109	17	265	134	3,496	5,941	312	237	965	1,067	12,553	789	13,342
1995	101	16	264	140	3,689	6,148	298	252	971	1,067	12,948	806	13,754
1996 ^f	104	16	257	149	3,800	6,187	293	231	1,004	1,001	13,047	769	13,816
1997 ^f	103	16	257	128	3,932	6,790	267	284	1,049	1,038	13,870	766	14,636
1998 ^f	119	23	311	157	4,325	7,453	299	278	1,183	1,113	15,266	811	16,077
1999 ^f	127	26	346	166	4,885	8,096	384	323	1,164	1,298	16,824	807	17,631
2000 ^f	138	36	368	160	5,593	9,429	411	374	1,336	1,617	19,471	889	20,360
2001	142	35	365	154	6,159	10,297	453	391	1,511	1,679	21,190	926	22,116
as a percentage of the Canada total													
1990	1.0	0.2	2.3	1.3	25.3	43.3	2.6	2.0	7.6	7.5	93.1	6.9	100.0
1991	1.0	0.1	2.2	1.1	26.6	42.9	2.6	2.0	7.3	7.3	93.2	6.8	100.0
1992	1.0	0.1	2.1	1.1	27.5	42.5	2.5	2.1	6.9	7.8	93.4	6.6	100.0
1993	0.9	0.1	2.0	1.1	27.0	43.8	2.4	1.9	6.8	7.5	93.6	6.4	100.0
1994	0.8	0.1	2.0	1.0	26.2	44.5	2.3	1.8	7.2	8.0	94.1	5.9	100.0
1995	0.7	0.1	1.9	1.0	26.8	44.7	2.2	1.8	7.1	7.8	94.1	5.9	100.0
1996 ^f	0.8	0.1	1.9	1.1	27.5	44.8	2.1	1.7	7.3	7.2	94.4	5.6	100.0
1997 ^f	0.7	0.1	1.8	0.9	26.9	46.4	1.8	1.9	7.2	7.1	94.8	5.2	100.0
1998 ^f	0.7	0.1	1.9	1.0	26.9	46.4	1.9	1.7	7.4	6.9	95.0	5.0	100.0
1999 ^f	0.7	0.1	2.0	0.9	27.7	45.9	2.2	1.8	6.6	7.4	95.4	4.6	100.0
2000 ^f	0.7	0.2	1.8	0.8	27.5	46.3	2.0	1.8	6.6	7.9	95.6	4.4	100.0
2001	0.6	0.2	1.7	0.7	27.8	46.6	2.0	1.8	6.8	7.6	95.8	4.2	100.0
as a percentage of PGDP													
1990	1.1	0.7	1.4	1.0	1.7	1.6	1.1	0.9	1.1	1.0	...	...	1.5
1991	1.1	0.7	1.4	0.9	1.8	1.6	1.2	1.0	1.1	1.0	...	...	1.6
1992	1.2	0.6	1.3	0.9	2.0	1.7	1.2	1.1	1.0	1.0	...	...	1.6
1993	1.1	0.7	1.3	0.9	2.0	1.8	1.2	1.0	1.0	1.0	...	...	1.7
1994	1.1	0.7	1.4	0.9	2.1	1.9	1.2	1.0	1.1	1.1	...	...	1.7
1995	0.9	0.6	1.4	0.9	2.1	1.9	1.1	1.0	1.1	1.0	...	...	1.7
1996 ^f	1.0	0.6	1.3	0.9	2.1	1.8	1.0	0.8	1.0	0.9	...	...	1.7
1997 ^f	1.0	0.6	1.3	0.8	2.1	1.9	0.9	1.0	1.0	0.9	...	...	1.7
1998 ^f	1.1	0.8	1.5	0.9	2.2	2.0	1.0	0.9	1.1	1.0	...	...	1.8
1999 ^f	1.0	0.8	1.5	0.9	2.3	2.0	1.2	1.0	1.0	1.1	...	...	1.8
2000 ^f	1.0	1.1	1.5	0.8	2.5	2.1	1.2	1.1	0.9	1.2	...	...	1.9
2001	1.0	1.0	1.4	0.7	2.6	2.3	1.3	1.2	1.0	1.3	...	...	2.0

¹ Includes the Yukon, Northwest Territories and Nunavut.

* Quebec and Ontario figures exclude federal government expenditures performed in the National Capital Region.

TABLE 6. R&D expenditures in the provinces by the federal government, in terms of performing and funding, 1990 to 2001

Year	N.-L.	P.E.I.	N.S.	N.B.	Que.*	Ont.*	Man.	Sask.	Alta	B.C.	Subtotal Canada ¹	NCR	Total Canada ¹
in millions of dollars													
Performing													
1990	35	10	81	36	215	249	94	50	77	95	943	711	1,654
1991	35	10	81	37	217	251	95	51	78	96	952	733	1,685
1992	35	9	73	36	234	274	81	56	78	86	963	753	1,716
1993	36	11	75	33	250	276	83	54	75	88	983	774	1,757
1994	34	11	84	28	226	254	80	46	92	103	965	789	1,754
1995	28	9	76	29	218	259	74	50	97	80	921	806	1,727
1996	26	9	79	31	225	360	75	45	91	77	1,023	769	1,792
1997	23	9	70	28	211	305	57	71	93	82	954	766	1,720
1998	26	10	77	31	226	276	49	54	94	85	932	811	1,743
1999 ^r	25	12	72	32	250	322	58	60	108	106	1,052	807	1,859
2000 ^r	30	16	88	27	350	314	69	62	116	111	1,192	889	2,080
2001	27	16	70	26	372	328	77	63	98	97	1,177	926	2,103
as a percentage of the Canada total													
1990	2.1	0.6	4.9	2.2	13.0	15.1	5.7	3.0	4.7	5.7	57.0	43.0	100.0
1991	2.1	0.6	4.8	2.2	12.9	14.9	5.6	3.0	4.6	5.7	56.5	43.5	100.0
1992	2.0	0.5	4.3	2.1	13.6	16.0	4.7	3.3	4.5	5.0	56.1	43.9	100.0
1993	2.0	0.6	4.3	1.9	14.2	15.7	4.7	3.1	4.3	5.0	55.9	44.1	100.0
1994	1.9	0.6	4.8	1.6	12.9	14.5	4.6	2.6	5.2	5.9	55.0	45.0	100.0
1995	1.6	0.5	4.4	1.7	12.6	15.0	4.3	2.9	5.6	4.6	53.3	46.7	100.0
1996	1.5	0.5	4.4	1.7	12.6	20.1	4.2	2.5	5.1	4.3	57.1	42.9	100.0
1997	1.3	0.5	4.1	1.6	12.3	17.7	3.3	4.1	5.4	4.8	55.5	44.5	100.0
1998	1.5	0.6	4.4	1.8	13.0	15.8	2.8	3.1	5.4	4.9	53.5	46.5	100.0
1999 ^r	1.3	0.6	3.9	1.7	13.4	17.3	3.1	3.2	5.8	5.7	56.6	43.4	100.0
2000 ^r	1.4	0.8	4.2	1.3	16.8	15.1	3.3	3.0	5.6	5.3	57.3	42.7	100.0
2001	1.3	0.8	3.3	1.2	17.7	15.6	3.7	3.0	4.7	4.6	56.0	44.0	100.0
in millions of dollars													
Funding													
1990	56	11	133	56	550	730	131	78	162	240	2,148	711	2,859
1991	54	12	135	54	568	746	133	84	168	258	2,213	733	2,946
1992	62	10	125	54	634	848	119	89	167	252	2,361	748	3,109
1993	59	12	120	63	660	849	121	87	164	251	2,388	767	3,156
1994	53	12	127	60	593	800	120	80	189	270	2,311	784	3,095
1995	43	11	112	60	580	756	110	80	206	233	2,192	797	2,989
1996	43	11	112	43	545	730	106	73	188	205	2,061	753	2,814
1997	40	10	107	41	546	745	87	93	191	200	2,065	749	2,814
1998	44	11	113	44	540	737	82	77	183	198	2,033	797	2,830
1999 ^r	48	14	113	49	665	868	98	103	218	238	2,421	795	3,216
2000 ^r	54	19	129	42	806	899	113	121	234	263	2,689	872	3,560
2001	51	20	120	44	963	1,084	121	123	283	278	3,090	907	3,997
as a percentage of the Canada total													
1990	2.0	0.4	4.7	2.0	19.2	25.5	4.6	2.7	5.7	8.4	75.1	24.9	100.0
1991	1.8	0.4	4.6	1.8	19.3	25.3	4.5	2.9	5.7	8.8	75.1	24.9	100.0
1992	2.0	0.3	4.0	1.7	20.4	27.3	3.8	2.9	5.4	8.1	75.9	24.1	100.0
1993	1.9	0.4	3.8	2.0	20.9	26.9	3.8	2.8	5.2	8.0	75.7	24.3	100.0
1994	1.7	0.4	4.1	1.9	19.2	25.8	3.9	2.6	6.1	8.7	74.7	25.3	100.0
1995	1.4	0.4	3.7	2.0	19.4	25.3	3.7	2.7	6.9	7.8	73.3	26.7	100.0
1996	1.5	0.4	4.0	1.5	19.4	25.9	3.8	2.6	6.7	7.3	73.2	26.8	100.0
1997	1.4	0.4	3.8	1.5	19.4	26.5	3.1	3.3	6.8	7.1	73.4	26.6	100.0
1998	1.6	0.4	4.0	1.6	19.1	26.0	2.9	2.7	6.5	7.0	71.8	28.2	100.0
1999 ^r	1.5	0.4	3.5	1.5	20.7	27.0	3.0	3.2	6.8	7.4	75.3	24.7	100.0
2000 ^r	1.5	0.5	3.6	1.2	22.6	25.3	3.2	3.4	6.6	7.4	75.5	24.5	100.0
2001	1.3	0.5	3.0	1.1	24.1	27.1	3.0	3.1	7.1	7.0	77.3	22.7	100.0

¹ Includes the Yukon, Northwest Territories and Nunavut.

* Quebec and Ontario figures exclude federal government expenditures performed in the National Capital Region.

TABLE 7. R&D expenditures in the provinces by business enterprise, in terms of performing and funding, 1990 to 2001

Year	N.-L.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta	B.C.	Total Canada ¹
in millions of dollars											
Performing											
1990	10	2	30	46	1,415	2,842	49	47	357	367	5,169
1991	10	2	26	30	1,520	2,952	64	54	349	348	5,355
1992 ^e	10	1	33	29	1,644	3,123	72	66	337	427	5,742
1993	11	2	44	41	1,802	3,507	90	60	396	471	6,424
1994 ^e	12	2	61	49	2,056	4,112	102	70	509	591	7,567
1995	11	3	64	52	2,277	4,320	96	74	491	602	7,991
1996 ^r	17	3	54	59	2,394	4,256	93	58	524	538	7,996
1997 ^r	14	2	54	37	2,519	4,833	89	82	546	564	8,741
1998 ^r	17	2	62	41	2,764	5,382	102	74	618	608	9,671
1999 ^r	18	3	66	40	3,047	5,780	148	78	490	722	10,394
2000 ^r	20	5	72	39	3,555	6,721	132	74	582	975	12,175
2001	20	4	78	34	3,897	7,296	161	82	614	992	13,179
as a percentage of the Canada total											
1990	0.2	0.0	0.6	0.9	27.4	55.0	0.9	0.9	6.9	7.1	100.0
1991	0.2	0.0	0.5	0.6	28.4	55.1	1.2	1.0	6.5	6.5	100.0
1992 ^e	0.2	0.0	0.6	0.5	28.6	54.4	1.3	1.1	5.9	7.4	100.0
1993	0.2	0.0	0.7	0.6	28.1	54.6	1.4	0.9	6.2	7.3	100.0
1994 ^e	0.2	0.0	0.8	0.6	27.2	54.3	1.3	0.9	6.7	7.8	100.0
1995	0.1	0.0	0.8	0.7	28.5	54.1	1.2	0.9	6.1	7.5	100.0
1996 ^r	0.2	0.0	0.7	0.7	29.9	53.2	1.2	0.7	6.6	6.7	100.0
1997 ^r	0.2	0.0	0.6	0.4	28.8	55.3	1.0	0.9	6.2	6.5	100.0
1998 ^r	0.2	0.0	0.6	0.4	28.6	55.7	1.1	0.8	6.4	6.3	100.0
1999 ^r	0.2	0.0	0.6	0.4	29.3	55.6	1.4	0.8	4.7	6.9	100.0
2000 ^r	0.2	0.0	0.6	0.3	29.2	55.2	1.1	0.6	4.8	8.0	100.0
2001	0.2	0.0	0.6	0.3	29.6	55.4	1.2	0.6	4.7	7.5	100.0
in millions of dollars											
Funding											
1990	6	2	23	43	1,197	1,996	41	44	315	289	3,960
1991	7	1	18	29	1,354	2,065	46	49	284	260	4,113
1992 ^e	7	1	25	29	1,444	2,181	55	62	301	335	4,445
1993	9	2	35	27	1,585	2,487	78	61	356	378	5,025
1994 ^e	11	2	54	35	1,810	2,880	90	71	448	465	5,874
1995	14	3	57	36	2,005	3,086	87	71	437	483	6,288
1996 ^r	18	2	49	60	2,142	3,108	87	60	467	388	6,396
1997 ^r	19	2	38	41	2,219	3,574	95	80	488	459	7,032
1998 ^r	23	3	44	45	2,461	3,579	105	57	482	531	7,344
1999 ^r	18	2	67	43	2,721	3,835	120	72	407	616	7,913
2000 ^r	21	5	72	43	3,161	4,114	139	75	497	836	8,979
2001	16	4	74	35	3,463	5,386	169	79	563	866	10,672
as a percentage of the Canada total											
1990	0.2	0.1	0.6	1.1	30.2	50.4	1.0	1.1	8.0	7.3	100.0
1991	0.2	0.0	0.4	0.7	32.9	50.2	1.1	1.2	6.9	6.3	100.0
1992 ^e	0.2	0.0	0.6	0.7	32.5	49.1	1.2	1.4	6.8	7.5	100.0
1993	0.2	0.0	0.7	0.5	31.5	49.5	1.6	1.2	7.1	7.5	100.0
1994 ^e	0.2	0.0	0.9	0.6	30.8	49.0	1.5	1.2	7.6	7.9	100.0
1995	0.2	0.0	0.9	0.6	31.9	49.1	1.4	1.1	6.9	7.7	100.0
1996 ^r	0.3	0.0	0.8	0.9	33.5	48.6	1.4	0.9	7.3	6.1	100.0
1997 ^r	0.3	0.0	0.5	0.6	31.6	50.8	1.4	1.1	6.9	6.5	100.0
1998 ^r	0.3	0.0	0.6	0.6	33.5	48.7	1.4	0.8	6.6	7.2	100.0
1999 ^r	0.2	0.0	0.8	0.5	34.4	48.5	1.5	0.9	5.1	7.8	100.0
2000 ^r	0.2	0.1	0.8	0.5	35.2	45.8	1.5	0.8	5.5	9.3	100.0
2001	0.1	0.0	0.7	0.3	32.4	50.5	1.6	0.7	5.3	8.1	100.0

¹ Includes the Yukon, Northwest Territories and Nunavut and Industry funding of federal R&D in the NCR.

During the period 1990 to 2001, Ontario led Canada in business R&D spending. Ontario's share of the total for Canada remains fairly constant at 55%. Quebec's share of the total fluctuates at around 29% over the same period.

The business enterprises' participation in the performance of provincial R&D accounts for more than 50% of R&D in the provinces of Ontario, Quebec and British Columbia. The share of the federal government's performance dollars for provincial R&D is more significant in the Atlantic provinces, Manitoba and Saskatchewan than in the other provinces.

TABLE 8. Provincial distribution of R&D by performing sectors, 2001

Performing Sector	N.-L.	P.E.I.	N.S.	N.B.	Que.*	Ont.*	Man.	Sask.	Alta	B.C.	Subtotal Canada ¹	NCR	Total Canada ¹
in millions of dollars													
Federal government	27	16	70	26	372	328	77	63	98	97	1,177	926	2,103
Provincial governments ²	5	0	6	4	68	76	3	10	113	22	307	0	307
Business enterprise	20	4	78	34	3,897	7,296	161	82	614	992	13,179	0	13,179
Higher Education ³	90	15	211	90	1,822	2,597	212	236	686	568	6,527	0	6,527
All sectors	142	35	365	154	6,159	10,297	453	391	1,511	1,679	21,190	926	22,116
as a percentage of the provincial total													
Federal government	19.0	45.7	19.2	16.9	6.0	3.2	17.0	16.1	6.5	5.8	5.6	100.0	9.5
Provincial governments ²	3.5	0.0	1.6	2.6	1.1	0.7	0.7	2.6	7.5	1.3	1.4	0.0	1.4
Business enterprise	14.1	11.4	21.4	22.1	63.3	70.9	35.5	21.0	40.6	59.1	62.2	0.0	59.6
Higher Education ³	63.4	42.9	57.8	58.4	29.6	25.2	46.8	60.4	45.4	33.8	30.8	0.0	29.5
All sectors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
as a percentage of the Canada total													
Federal government	1.3	0.8	3.3	1.2	17.7	15.6	3.7	3.0	4.7	4.6	56.0	44.0	100.0
Provincial governments ²	1.6	0.0	2.0	1.3	22.1	24.8	1.0	3.3	36.8	7.2	100.0	0.0	100.0
Business enterprise	0.2	0.0	0.6	0.3	29.6	55.4	1.2	0.6	4.7	7.5	100.0	0.0	100.0
Higher Education ³	1.4	0.2	3.2	1.4	27.9	39.8	3.2	3.6	10.5	8.7	100.0	0.0	100.0
All sectors	0.6	0.2	1.7	0.7	27.8	46.6	2.0	1.8	6.8	7.6	95.8	4.2	100.0

¹ Includes the Yukon, Northwest Territories and Nunavut

² Includes provincial research councils and foundations.

³ Includes private non-profit institutions.

* Quebec and Ontario figures exclude federal government expenditures performed in the National Capital Region.

TABLE 9. Provincial distribution of R&D by funding sectors, 2001

Funding Sector	N.-L.	P.E.I.	N.S.	N.B.	Que.*	Ont.*	Man.	Sask.	Alta	B.C.	Subtotal Canada ¹	NCR	Total Canada ¹
in millions of dollars													
Federal government	51	20	120	44	963	1,084	121	123	283	278	3,090	907	3,997
Provincial governments ²	10	1	12	4	285	377	22	52	250	73	1,086	3	1,089
Business enterprise	16	4	74	35	3,463	5,386	169	79	563	866	10,656	16	10,672
Higher Education ³	58	10	137	68	983	1,380	127	126	312	311	3,512	0	3,512
Foreign	7	0	22	3	465	2,070	14	11	103	151	2,846	0	2,846
All sectors	142	35	365	154	6,159	10,297	453	391	1,511	1,679	21,190	926	22,116
as a percentage of the provincial total													
Federal government	35.9	57.1	32.9	28.6	15.6	10.5	26.7	31.5	18.7	16.6	14.6	97.9	18.1
Provincial governments ²	7.0	2.9	3.3	2.6	4.6	3.7	4.9	13.3	16.5	4.3	5.1	0.3	4.9
Business enterprise	11.3	11.4	20.3	22.7	56.2	52.3	37.3	20.2	37.3	51.6	50.3	1.7	48.3
Higher Education ³	40.8	28.6	37.5	44.2	16.0	13.4	28.0	32.2	20.6	18.5	16.6	0.0	15.9
Foreign	4.9	0.0	6.0	1.9	7.5	20.1	3.1	2.8	6.8	9.0	13.4	0.0	12.9
All sectors	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
as a percentage of the Canada total													
Federal government	1.3	0.5	3.0	1.1	24.1	27.1	3.0	3.1	7.1	7.0	77.3	22.7	100.0
Provincial governments ²	0.9	0.1	1.1	0.4	26.2	34.6	2.0	4.8	23.0	6.7	99.7	0.3	100.0
Business enterprise	0.1	0.0	0.7	0.3	32.4	50.5	1.6	0.7	5.3	8.1	99.9	0.1	100.0
Higher Education ³	1.7	0.3	3.9	1.9	28.0	39.3	3.6	3.6	8.9	8.9	100.0	0.0	100.0
Foreign	0.2	0.0	0.8	0.1	16.3	72.7	0.5	0.4	3.6	5.3	100.0	0.0	100.0
All sectors	0.6	0.2	1.7	0.7	27.8	46.6	2.0	1.8	6.8	7.6	95.8	4.2	100.0

¹ Includes the Yukon, Northwest Territories and Nunavut.² Includes provincial research councils and foundations.³ Includes private non-profit institutions.

* Quebec and Ontario figures exclude federal government expenditures performed in the National Capital Region.

TABLE 10. R&D Expenditures Performed by the Federal Government in the National Capital Region, 1990 to 2001

Year	National Capital Region Quebec	National Capital Region Ontario	National Capital Region Total
in millions of dollars			
1990	16	695	711
1991	16	717	733
1992	16	737	753
1993	15	759	774
1994	40	749	789
1995	28	778	806
1996 ^f	19	750	769
1997 ^f	19	747	766
1998 ^f	30	781	811
1999 ^f	41	766	807
2000 ^f	39	850	889
2001	41	885	926

GERD values have improved in recent years through changes made in the estimation of higher education R&D values (HERD). Details on revisions made to the estimation procedure are published in "Estimation of research and development expenditures in the higher education sector, 2001-2002". More improvements to HERD are expected in future years as investigations into the estimation procedures continue.

More details of the GERD can be found in the working paper titled "Estimates of Canadian research and development expenditures (GERD), Canada, 1992 to 2003^p, and by province 1992 to 2001". This paper provides more detail for both Canada and the provinces in the matrix format.

Note of Appreciation

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Symbols

- .. figures not available
- ... figures not appropriate or not applicable
- ^e estimated figures
- ^p preliminary figures
- ^r revised figures

This publication was prepared by **Janet Thompson** under the direction of **Antoine Rose**, Science, Innovation and Electronic Information Division.

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/88-202-XIE.htm>

Federal Scientific 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/88-204-XIE.htm>