

# **International Comparisons**

**Table 1. Gross domestic expenditure on R&D (GERD) at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	22 376.2 e	..	24 057.3 e	..	..
Austria	6 837.0 e	14 344.9 e	14 567.3	15 563.1 e	16 607.3	16 344.2 e	17 120.7 p
Belgium	6 225.2	13 895.7	15 301.0	17 168.8	20 238.2	21 120.6 e	21 919.5 p
Canada	23 090.0	29 014.6	29 788.7	32 190.0	32 898.2	34 039.6	34 452.5 p
Chile	..	1 576.3 b	1 608.7	1 764.9 e	1 667.2 e	1 612.5 e	..
Colombia	582.2	1 800.0	1 809.6	2 333.4	2 565.1 e	2 230.6 e	..
Czech Republic	2 619.5	6 369.8	7 274.5	8 305.7	9 093.8	9 098.1	9 566.0 p
Denmark	4 429.5	9 208.0	9 354.5	9 877.9	10 091.0	10 530.2	10 685.5 p
Estonia	206.7	512.2	568.9	678.7	844.4	918.1	1 013.6 p
Finland	5 588.7	6 727.4	7 147.7	7 540.5	8 009.2	8 422.7	9 059.3
France	39 530.1	63 651.4	65 592.8	68 654.0	74 589.7	74 926.3	76 952.3
Germany	64 028.3	122 472.2	133 668.0	142 320.2	151 081.4	146 996.4 e	153 232.3 p
Greece	1 627.0	2 980.4	3 544.8	3 858.2	4 258.9	4 583.9	4 829.2 p
Hungary	1 586.8	3 235.5	3 802.3	4 703.1 b	4 986.2	5 307.3	5 862.6
Iceland	296.8	378.5 e	398.2	403.6 e	503.3	495.6 e	608.0
Ireland	2 006.5	3 997.4 e	4 692.3 e	4 812.4 e p	5 424.1 e p	5 771.8 e p	5 662.8 b p
Israel	6 966.3 d	14 601.5 d	15 894.3 d	17 068.6 d	19 331.5 d	21 146.5 d	22 934.4 d e
Italy	18 241.2	33 076.6 b	34 488.8	37 039.9	39 982.8	38 637.5	40 939.9
Japan	128 694.6	160 269.3	166 621.7	172 035.8 b	172 245.5	171 652.3	176 961.5
Korea	30 618.3 d	80 816.0	90 289.9	100 282.6	103 975.2	111 115.8	119 617.3
Latvia	164.2	227.8	284.6	380.1	401.0	431.3	456.1 p
Lithuania	361	747	856	955	1 109	1 273	1 359
Luxembourg	498.8	835.9	849.6	829.9	876.7	803.4 e p	860.7 p
Mexico	5 346.2	9 241.7	8 079.1 e	7 788.1 e	7 182.9 e	6 917.3 e	..
Netherlands	10 892.4	19 152.7	20 560.0	21 312.0	22 811.3	24 223.6	25 081.0 p
New Zealand	1 189.3	..	2 740.8	..	3 210.9 p	..	..
Norway	3 275.8	6 308.0	7 095.1	7 593.6	7 986.6	7 862.7	8 578.6 p
Poland	2 984.9	10 354.7	11 807.2	14 669.1	17 572.5	18 550.0	20 663.5 p
Portugal	1 808.2	4 179.9	4 490.5	4 847.6	5 354.6	5 808.6	6 278.5 p
Slovak Republic	441.0	1 273.5	1 450.2	1 427.7	1 500.6	1 613.3	1 721.3
Slovenia	676.5	1 406.9	1 407.2	1 572.8	1 794.2	1 841.0	1 982.7 p
Spain	13 251.1	20 633.5	22 293.2	23 656.3	25 404.0	25 375.1	27 550.0 p
Sweden	10 388.2 b	16 250.6 e	17 569.8 v	18 086.3 e	19 640.2 v	20 281.3	20 974.1
Switzerland	..	..	17 720.9	..	19 892.4	..	..
Türkiye	4 595.6	19 855.1	21 572.2	23 602.5	24 653.0	25 391.2	29 168.4
United Kingdom	30 639.7	67 116.3 e p	70 754.9 e p	84 852.3 b e p	87 808.3 p	90 094.4 p	..
United States	326 231.0 d	533 465.0 b d	565 685.0 d	618 066.0 d	677 881.0 d	730 329.0 d	806 013.0 d p
EU27 (from 01/02/2020)	196 273.8 e	360 092.7 e	386 613.2 e	413 809.3 e	447 984.6 e	449 291.8 e	470 730.5 e
<b>OECD-Total</b>	<b>793 120.9 e</b>	<b>1 328 757.1 e</b>	<b>1 411 118.9 e</b>	<b>1 521 284.2 e</b>	<b>1 627 529.4 e</b>	<b>1 695 625.7 e</b>	<b>1 821 342.9 e</b>
Argentina	2 221.5	4 693.4	5 782.0	5 123.0	4 886.1	4 898.4	..
China	86 219.6	393 015.5	420 815.6	465 287.5	..	..	..
Romania	844.7	2 301.4	2 675.5	2 863.4	3 050.0	2 988.5	3 280.1 p
Russian Federation	18 120.5	39 013.0	42 246.1	41 895.9	45 687.0	47 954.2	..
Singapore	5 389.3	10 402.4	10 160.6	10 270.5	11 052.7	12 369.8	..
South Africa	3 979.4	5 795.2	6 025.6	5 637.3	5 147.9	..	..
Chinese Taipei	15 291.5	34 340.6	36 522.7	40 334.3	44 089.9	47 935.4	55 395.7

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 2. Gross domestic expenditure on R&D (GERD) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	1.79 e	..	1.80 e	..	..
Austria	2.37 e	3.12 e	3.06	3.09 e	3.13	3.20 e	3.19 p
Belgium	1.79	2.52	2.67	2.86	3.16	3.35 e	3.22 p
Canada	1.97	1.73	1.69	1.74	1.76	1.89	1.70 p
Chile	..	0.37 b	0.36	0.37 e	0.34 e	0.34 e	..
Colombia	0.17	0.27	0.26	0.31	0.32 e	0.29 e	..
Czech Republic	1.16	1.67	1.77	1.90	1.93	1.99	2.00 p
Denmark	2.39	3.09	2.93	2.97	2.90	2.97	2.81 p
Estonia	0.92	1.24	1.28	1.41	1.63	1.75	1.75 p
Finland	3.32	2.72	2.73	2.76	2.80	2.91	2.99
France	2.05	2.22	2.20	2.20	2.19	2.30	2.21
Germany	2.44	2.94	3.05	3.11	3.17	3.13 e	3.13 p
Greece	0.58	1.01	1.15	1.21	1.27	1.51	1.45 p
Hungary	0.92	1.18	1.32	1.51 b	1.47	1.59	1.65
Iceland	2.68	2.11 e	2.08	2.00 e	2.33	2.47 e	2.80
Ireland	1.19	1.18 e	1.25 e	1.17 e p	1.23 e p	1.23 e p	1.06 b p
Israel	3.92 d	4.47 d	4.62 d	4.78 d	5.22 d	5.71 d	5.56 d e
Italy	1.04	1.37 b	1.37	1.42	1.46	1.51	1.48
Japan	3.13	3.11	3.17	3.22 b	3.22	3.27	3.30
Korea	2.52 d	3.99	4.29	4.52	4.63	4.80	4.93
Latvia	0.53	0.44	0.51	0.64	0.64	0.69	0.69 p
Lithuania	1	1	1	1	1	1	1
Luxembourg	1.56	1.27	1.24	1.17	1.18	1.06 e p	1.02 p
Mexico	0.40	0.39	0.33 e	0.31 e	0.28 e	0.30 e	..
Netherlands	1.77	2.15	2.18	2.14	2.18	2.32	2.26 p
New Zealand	1.12	..	1.35	..	1.40 p	..	..
Norway	1.48	2.03	2.08	2.03	2.14	2.24	1.94 p
Poland	0.56	0.97	1.04	1.21	1.32	1.39	1.44 p
Portugal	0.76	1.28	1.32	1.35	1.40	1.61	1.66 p
Slovak Republic	0.49	0.79	0.88	0.84	0.82	0.90	0.93
Slovenia	1.42	2.01	1.87	1.95	2.04	2.14	2.14 p
Spain	1.10	1.19	1.21	1.24	1.25	1.41	1.43 p
Sweden	3.36 b	3.25 e	3.36 v	3.32 e	3.39 v	3.49	3.35
Switzerland	..	..	3.07	..	3.19	..	..
Türkiye	0.56	0.94	0.95	1.03	1.07	1.09	1.13
United Kingdom	1.55	2.31 e p	2.32 e p	2.70 b e p	2.67 p	2.93 p	..
United States	2.50 d	2.85 b d	2.90 d	3.01 d	3.17 d	3.47 d	3.46 d p
EU27 (from 01/02/2020)	1.68 e	1.99 e	2.03 e	2.07 e	2.11 e	2.19 e	2.15 e
<b>OECD-Total</b>	<b>2.14 e</b>	<b>2.37 e</b>	<b>2.41 e</b>	<b>2.49 e</b>	<b>2.56 e</b>	<b>2.74 e</b>	<b>2.71 e</b>
Argentina	0.42	0.53	0.56	0.49	0.47	0.52	..
China	1.31	2.10	2.12	2.14	..	..	..
Romania	0.41	0.48	0.50	0.50	0.48	0.47	0.48 p
Russian Federation	0.99	1.10	1.11	0.99	1.04	1.10	..
Singapore	2.15	2.07	1.90	1.81	1.90	2.22	..
South Africa	0.86	0.82	0.83	0.75	0.68	..	..
Chinese Taipei	2.33	3.09	3.19	3.35	3.49	3.63	3.78

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 3. Gross domestic expenditure on R&D (GERD) at 2015 prices and PPP**

Million 2015 USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	21 236.9 e	..	21 738.7 e	..	..
Austria	9 095.0 e	13 698.8 e	13 738.6	14 234.1 e	14 640.1	13 996.9 e	14 577.3 p
Belgium	8 122.8	13 310.2	14 293.8	15 605.9	17 610.4	17 710.6 e	18 017.5 p
Canada	26 964.2	27 755.6	28 228.1	29 895.1	30 696.6	31 111.0	30 477.2 p
Chile	..	1 530.9 b	1 492.1	1 605.5 e	1 498.5 e	1 387.7 e	..
Colombia	661.1	1 723.6	1 686.1	2 068.8	2 200.9 e	1 838.1 e	..
Czech Republic	3 376.1	6 121.9	6 818.1	7 557.1	7 902.0	7 694.3	8 007.9 p
Denmark	6 192.0	8 901.1	8 674.1	8 951.6	8 873.4	8 912.2	8 853.5 p
Estonia	304.8	492.1	534.8	612.9	735.7	785.2	848.7 p
Finland	7 363.1	6 522.7	6 739.4	6 890.2	7 081.2	7 193.0	7 607.9
France	50 868.1	61 077.2	61 816.0	62 905.3	63 922.6	61 960.3	63 542.7
Germany	82 366.3	116 904.2	124 393.9	128 211.8	131 969.4	125 566.6 e	129 005.3 p
Greece	2 088.4	2 896.9	3 356.7	3 594.6	3 847.2	4 140.4	4 318.8 p
Hungary	2 204.5	3 180.8	3 702.2	4 465.7 b	4 575.3	4 724.1	5 227.2
Iceland	360.9	365.0 e	375.7	378.3 e	450.5	446.4 e	527.4
Ireland	2 757.1	3 893.1 e	4 521.0 e	4 574.7 e p	5 063.6 e p	5 408.5 e p	5 263.6 b p
Israel	7 944.9 d	14 047.3 d	15 147.3 d	16 282.0 d	18 519.3 d	19 882.5 d	21 031.7 d e
Italy	24 566.5	31 016.5 b	31 619.5	33 176.9	34 206.9	32 098.5	33 805.9
Japan	154 899.9	162 761.3	168 668.2	172 586.2 b	171 840.9	167 081.6	172 062.5
Korea	33 986.3 d	79 364.7	88 135.8	95 437.7	99 970.9	102 880.5	110 148.1
Latvia	225.0	220.0	266.9	346.9	354.5	374.5	392.0 p
Lithuania	491	723	803	872	968	1 106	1 144
Luxembourg	750.6	817.1	809.6	775.1	800.5	713.0 e p	721.7 p
Mexico	7 136.1	8 875.6	7 673.5 e	7 335.4 e	6 768.4 e	6 500.7 e	..
Netherlands	13 594.6	18 724.0	19 517.7	19 613.8	20 423.3	20 865.0	21 256.1 p
New Zealand	1 548.3	..	2 525.7	..	2 801.2 p	..	..
Norway	4 058.1	6 253.1	6 677.5	6 801.2	6 990.0	6 826.6	7 009.1 p
Poland	3 924.0	10 156.5	11 446.6	14 093.0	16 151.2	16 575.1	18 345.9 p
Portugal	2 356.9	4 014.3	4 280.1	4 503.0	4 781.7	5 070.6	5 502.7 p
Slovak Republic	555.3	1 310.4	1 513.1	1 486.9	1 500.2	1 583.1	1 692.7
Slovenia	826.2	1 352.1	1 316.8	1 434.9	1 557.1	1 563.8	1 689.6 p
Spain	17 015.8	19 883.6	20 817.9	21 852.2	22 442.6	22 449.9	24 006.5 p
Sweden	13 290.4 b	15 948.9 e	16 939.9 v	17 055.9 e	17 743.1 v	17 880.8	18 089.5
Switzerland	..	..	17 194.9	..	18 572.9	..	..
Türkiye	6 932.3	19 603.8	21 401.6	23 715.2	24 848.0	25 873.2	29 909.3
United Kingdom	38 064.0	65 503.1 e p	67 444.9 e p	79 862.8 b e p	79 964.0 p	78 153.3 p	..
United States	390 306.5 d	528 171.7 b d	549 631.0 d	586 427.3 d	631 845.5 d	671 963.3 d	709 712.9 d p
EU27 (from 01/02/2020)	255 096.8 e	345 479.5 e	362 535.6 e	377 757.5 e	392 468.1 e	383 627.6 e	397 535.2 e
<b>OECD-Total</b>	<b>972 301.6 e</b>	<b>1 304 103.9 e</b>	<b>1 362 218.1 e</b>	<b>1 437 203.8 e</b>	<b>1 505 856.5 e</b>	<b>1 536 781.0 e</b>	<b>1 609 214.4 e</b>
Argentina	2 670.4	4 502.1	4 857.0	4 203.1	3 938.3	3 901.1	..
China	93 020.7	399 390.2	430 329.7	464 705.2	..	..	..
Romania	1 334.9	2 157.3	2 420.9	2 518.6	2 504.8	2 363.0	2 536.0 p
Russian Federation	27 032.1	38 947.8	39 921.0	36 616.4	39 201.3	40 322.3 e	..
Singapore	5 975.9	10 320.3	9 871.8	9 760.7	10 347.0	11 435.9	..
South Africa	4 620.0	5 715.4	5 890.6	5 384.5	4 852.8	..	..
Chinese Taipei	18 040.6	34 745.1	37 159.2	40 079.7	43 043.6	46 238.7	51 303.8

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 4. Gross domestic expenditure on R&D (GERD) per capita at current prices and PPP**

USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	909.5 e	..	948.4 e	..	..
Austria	831.2 e	1 641.3 e	1 656.3	1 761.0 e	1 870.7	1 833.0 e	1 912.6 p
Belgium	594.1	1 226.3	1 345.1	1 502.5	1 761.5	1 829.6 e	1 890.9 p
Canada	716.1	803.5	815.1	868.5	874.9	895.6	901.3 p
Chile	..	86.8 b	87.3	94.1 e	87.3 e	82.9 e	..
Colombia	14.4	39.3	39.0	49.4	53.1 e	45.3 e	..
Czech Republic	256.0	602.9	687.0	781.6	852.3	850.3	894.2 p
Denmark	817.4	1 607.3	1 622.6	1 704.9	1 734.7	1 806.2	1 825.3 p
Estonia	152.1	389.2	432.4	514.5	637.4	690.9	762.1 p
Finland	1 065.3	1 224.2	1 297.7	1 367.0	1 450.5	1 522.9	1 634.8
France	625.8	952.4	977.3	1 017.9	1 100.8	1 101.8	1 128.1
Germany	787.2	1 487.2	1 617.1	1 716.6	1 818.2	1 767.6 e	1 841.8 p
Greece	148.1	276.6	329.6	359.5	397.2	428.5	453.9 p
Hungary	157.3	329.7	388.5	481.1 b	510.3	544.3	603.8
Iceland	1 003.0	1 128.5 e	1 159.6	1 144.4 e	1 395.6	1 352.3 e	1 632.3
Ireland	482.3	841.7 e	977.1 e	990.1 e p	1 100.9 e p	1 158.9 e p	1 128.4 b p
Israel	1 000.7 d	1 709.1 d	1 824.9 d	1 922.3 d	2 135.8 d	2 295.0 d	2 448.3 d e
Italy	313.6	550.2 b	574.8	618.6	669.4	650.0	692.3
Japan	1 007.4	1 262.6	1 315.0	1 360.6 b	1 365.2	1 365.5	1 410.0
Korea	635.4 d	1 577.9	1 757.9	1 944.0	2 008.6	2 143.6	2 311.7
Latvia	73.3	116.3	146.6	197.3	209.6	226.9	242.2 p
Lithuania	109	261	303	341	397	455	484
Luxembourg	1 071.0	1 431.0	1 423.1	1 363.2	1 410.6	1 273.1 e p	1 342.7 p
Mexico	49.9	76.7	66.3 e	63.1 e	57.5 e	54.7 e	..
Netherlands	667.4	1 124.6	1 200.2	1 236.8	1 315.1	1 388.8	1 430.5 p
New Zealand	286.7	..	566.6	..	640.6 p	..	..
Norway	708.6	1 204.7	1 344.5	1 429.5	1 493.4	1 461.7	1 586.3 p
Poland	78.2	269.5	307.3	381.9	457.8	483.7	541.5 p
Portugal	172.2	404.8	436.0	471.4	520.6	564.1	610.3 p
Slovak Republic	81.9	234.5	266.7	262.1	275.2	295.5	316.4
Slovenia	338.1	681.4	681.2	759.1	858.9	875.5	940.7 p
Spain	303.5	444.2	479.1	506.2	539.3	535.8	582.1 p
Sweden	1 150.5 b	1 637.7 e	1 746.9 v	1 777.5 e	1 910.7 v	1 958.9	2 013.7
Switzerland	..	..	2 096.7	..	2 319.7	..	..
Türkiye	67.2	250.4	268.6	289.9	298.5	304.5	346.6
United Kingdom	507.2	1 022.4 e p	1 071.4 e p	1 277.2 b e p	1 314.6 p	1 343.1 p	..
United States	1 102.2 d	1 643.4 b d	1 730.7 d	1 879.8 d	2 051.0 d	2 201.4 d	2 426.2 d p
EU27 (from 01/02/2020)	451.8 e	808.9 e	867.0 e	926.3 e	1 000.5 e	1 002.4 e	1 050.8 e
<b>OECD-Total</b>	<b>639.3 e</b>	<b>997.2 e</b>	<b>1 052.7 e</b>	<b>1 127.9 e</b>	<b>1 198.9 e</b>	<b>1 243.3 e</b>	<b>1 331.8 e</b>
Argentina	57.6	107.7	131.3	115.1	108.7	107.9	..
China	65.9	282.3	300.6	331.1	..	..	..
Romania	39.6	116.8	136.6	147.0	157.4	155.1	170.8 p
Russian Federation	126.3	266.0	287.7	285.3	311.3	327.4	..
Singapore	1 263.3	1 855.2	1 810.5	1 821.3	1 937.7	2 175.5	..
South Africa	83.6	105.0	107.8	99.6	89.8	..	..
Chinese Taipei	671.6	1 458.8	1 549.5	1 709.9	1 868.0	2 034.5	2 369.9

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 5. Estimated civil GERD (Gross domestic expenditure on R&D) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	..	..	..	..	..	..	..
Belgium	1.79	..	..	..	..	..	..
Canada	..	..	..	..	..	..	..
Chile	..	0.37 b	0.36	0.37 e s	..	..	..
Colombia	0.17	0.27	0.26	0.31	0.32 e	0.29 e	..
Czech Republic	1.15	..	..	..	..	..	..
Denmark	..	..	..	..	..	..	..
Estonia	0.91 e	..	1.27	..	..	..	..
Finland	3.30	..	..	..	..	..	..
France	1.88	..	..	..	..	..	..
Germany	2.41 e	..	..	..	..	..	..
Greece	..	..	..	..	..	..	..
Hungary	0.91	1.18	1.31	..	..	..	..
Iceland	2.68	2.11 e	2.08	2.00 e	2.33	2.47 e	2.80
Ireland	1.19	1.18 e	1.25 e	1.17 e p	1.23 e p	1.23 e p	1.06 b p
Israel	3.92	4.47	4.62	4.78	5.22	5.71	5.56 e
Italy	..	..	..	..	..	..	..
Japan	3.10 e	..	..	..	..	..	..
Korea	2.46 d	3.86	4.11	4.36	4.45	4.60	4.72
Latvia	..	.. c	.. c	.. c	.. c	..	..
Lithuania	1	1	1	1	1	..	..
Luxembourg	1.56	1.27	1.24	1.17	1.18	1.06 e p	1.02 p
Mexico	..	..	..	..	..	..	..
Netherlands	..	..	..	..	..	..	..
New Zealand	..	..	1.34	..	1.40 p	..	..
Norway	..	..	..	..	..	..	..
Poland	..	..	..	..	..	..	..
Portugal	0.75	1.27	1.31	..	..	..	..
Slovak Republic	0.49	0.78	0.88	..	..	..	..
Slovenia	1.42	..	..	..	..	..	..
Spain	..	1.16	1.17	..	..	..	..
Sweden	3.24 b	..	..	..	..	..	..
Switzerland	..	..	..	..	..	..	..
Türkiye	..	0.92	..	..	..	..	..
United Kingdom	1.36	..	..	..	..	..	..
United States	2.08 d	..	..	..	..	..	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	0.42	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	0.41	..	..	..	..	..	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	0.81	0.78	0.79	0.72	0.64	..	..
Chinese Taipei	2.26	3.05	3.15	3.31	3.43	3.58	3.72

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 6. Basic research expenditure as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	..	..	0.54 d	..	0.55 d	..	..
Belgium	..	..	0.29	..	0.40	..	..
Canada	..	..	..	..	..	..	..
Chile	..	0.11 b m	0.11 m	0.12 s	..	..	..
Colombia	..	..	..	..	..	..	..
Czech Republic	0.36	0.48	0.48	0.49	0.51	0.54	..
Denmark	0.45 e	..	0.53	..	0.54	..	..
Estonia	0.27	0.34	0.35	0.38	0.39	0.34	..
Finland	..	..	..	..	..	..	..
France	0.49	0.50 e	0.50 s	0.50 e s	0.50 e	..	..
Germany	..	..	..	..	..	..	..
Greece	..	..	0.36	..	0.41	0.52	..
Hungary	0.25	0.22 e	0.25 e	0.28 b e	0.30 e	0.33 e	..
Iceland	0.50	0.45	0.44	0.42 e	0.43	0.45	0.47
Ireland	0.28	..	0.20 e	..	..	..	..
Israel	0.63 d e	0.51 d e	0.49 d e	0.50 d e	0.51 d e	0.53 d e	0.50 d e
Italy	0.29	0.32 b	0.30	0.31	0.31	0.33	..
Japan	0.38	0.39	0.42	0.40 b	0.40	0.40	0.42
Korea	0.39 d	0.64	0.62	0.64	0.68	0.69	0.73
Latvia	0.11	0.13	0.16	0.23	0.22	0.21	..
Lithuania	0	0	0	0	0	0	..
Luxembourg	..	..	0.45	..	0.48	..	..
Mexico	..	0.12	0.10 e	0.09 e	0.09 e	0.09 e	..
Netherlands	..	0.55	0.54	0.55	0.55	..	..
New Zealand	0.34	..	0.34	..	0.31	..	..
Norway	0.29	..	0.38	..	0.39	..	..
Poland	0.17	0.29	0.30	0.39	0.53	0.46	..
Portugal	0.19	0.29	0.29	0.29	0.30	0.31	..
Slovak Republic	0.23	0.32	0.33	0.34	0.33	0.35	..
Slovenia	0.20	0.35	0.33	0.37	0.40	0.47	..
Spain	0.19 m	0.26 e	0.26	0.26	0.29	0.33	..
Sweden	..	..	..	..	..	..	..
Switzerland	..	..	1.36	..	1.34	..	..
Türkiye	..	..	..	..	..	..	..
United Kingdom	..	..	..	..	..	..	..
United States	0.46 d	0.47 d	0.46 d	0.48 d	0.49 d	0.53 d	0.51 d p
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	0.11	0.15	0.14	0.13	0.10	0.13	..
China	0.07	0.11	0.12	0.12	..	..	..
Romania	0.09 m	0.12	0.10	0.10	0.09	0.09	..
Russian Federation	0.13 m	0.15 d	0.15 d	0.16 d	0.17 d	0.19 d	..
Singapore	0.44	0.47	0.44	0.43	0.43	0.43	..
South Africa	0.16	0.22	0.22	0.21	0.22	..	..
Chinese Taipei	0.24	0.27 b	0.26	0.25	0.25	0.26	0.28

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 7. Total researchers in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	28 470 d e	46 993 d e	47 521 d	50 139 d e	52 794 d	51 892 d e	55 052 d e
Belgium	33 146	54 280 e	54 010	57 456	60 619	64 053 e	76 312 d p
Canada	136 700	158 980	162 270	175 020	182 760	..	..
Chile	..	8 985 d	9 099 d	9 804 d e	9 671 d e	9 962 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	24 169 b	37 338	39 181	41 198	42 500	44 206	48 080 p
Denmark	28 179	44 815	43 966	43 924	44 671 p	44 553 p	45 017 p
Estonia	3 331	4 338	4 674	4 968	4 995	5 098	5 370 p
Finland	39 582	35 908	37 047	37 891	39 984	41 707	43 554
France	202 507	285 488	296 324	305 439	313 374	321 550 e p	340 004
Germany	272 148	399 605	419 617	433 685	450 697	450 796	459 510 p
Greece	19 593 d	29 403 d	35 000 d	36 688 d	39 077 d	42 949 d	44 317 d p
Hungary	15 878	25 804	28 426	37 606 d	39 295 d	42 099 d	43 324
Iceland	2 155	..	2 050	..	..	..	2 561
Ireland	11 587	24 316 e	24 445 e	22 808 e	23 537	23 929 e	..
Israel	..	..	..	..	..	..	..
Italy	82 489 d	133 706 b d	140 378 d	152 307 d	160 824 d	156 989 d	172 719
Japan	680 631 d	665 566 d	676 292 d	678 134 b d	681 821 d	689 889 d	704 502 d
Korea	179 812 d	361 292	383 100	408 370	430 690	446 739	470 728
Latvia	3 282 d	3 152 d	3 482 d	3 456 d	3 632 d	4 072 d	4 526 p
Lithuania	7 637	8 525	8 741	8 938	9 630	10 183	11 017
Luxembourg	2 227	2 767	2 936	2 863	3 126	2 937 e p	3 206 p
Mexico	43 922	38 883	39 125 e	39 189 e	41 745 e	44 966 e	..
Netherlands	47 854	87 612	91 023	95 475	97 713	102 077	106 064 p
New Zealand	12 986	..	24 000	..	28 000	..	..
Norway	21 200	31 913	33 632	34 337	35 898	36 316	38 615 p
Poland	62 162	88 165	114 585 d	117 789 d	120 780 d	124 600 d	135 650 p
Portugal	21 126	41 349	44 938	47 652	50 166	53 174	56 202 p
Slovak Republic	10 921 d	14 149 d	15 226 d	16 337 d	16 977 d	17 276 d	17 519
Slovenia	5 253	8 119	9 301 d	10 068 d	10 507 d	10 845 d	11 071 p
Spain	109 720	126 633 d	133 213 d	140 120 d	143 974 d	145 372 d	154 125 p
Sweden	55 001 b e	70 372 e	73 132	75 151 e	78 629	80 089	84 695
Switzerland	..	..	44 273	..	47 699	..	..
Türkiye	39 139	100 158	111 893	126 249	135 515	149 731	168 879
United Kingdom	248 599 b e	291 103 e	295 842	..	..	..	..
United States	1 048 102 e	1 248 221 e	1 300 600 e	1 410 842 e	1 435 937 e	1 493 075 e	..
EU27 (from 01/02/2020)	1 126 163 e	1 616 030 e	1 709 668 e	1 785 801 e	1 853 060 e	1 887 193 e	1 991 440 e
<b>OECD-Total</b>	<b>3 796 188 e</b>	<b>4 903 594 e</b>	<b>5 115 504 e</b>	<b>5 390 726 e</b>	<b>5 550 200 e</b>	<b>5 675 903 e</b>	<b>..</b>
Argentina	31 868	54 805	53 184	54 307	54 904	55 902	..
China	1 118 698 d	1 692 176	1 740 442	1 866 109	..	..	..
Romania	22 958	18 046	17 518	17 213	17 350	18 331	19 113 p
Russian Federation	464 577	428 884	410 617	405 772	400 663	397 187	..
Singapore	23 789	39 207	38 898	39 293	42 485	42 579	..
South Africa	17 303	27 656	29 515	29 111	28 358	..	..
Chinese Taipei	88 859	147 141	149 886	153 998	159 160	163 536	167 766

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 8. Total researchers in full-time equivalent per thousand total employment***Per thousand*

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	7.4 d e	10.8 d e	10.8 d	11.2 d e	11.6 d e	11.6 d e	12.1 d e
Belgium	7.8	11.6 e	11.4	11.9	12.4	13.1 e	15.3 d e p
Canada	8.3	8.7	8.7	9.2	9.4	..	..
Chile	..	1.1 d	1.1 d	1.2 d e	1.1 d e	1.3 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	4.9 b	7.1	7.3	7.6	7.8	8.3 e	9.0 e p
Denmark	10.1	15.6	15.0	14.8	14.9 e p	15.0 e p	14.8 e p
Estonia	5.4	6.9	7.3	7.6	7.7 e	7.9 e	8.3 e p
Finland	16.4	14.2	14.5	14.4	15.0 e	15.9 e	16.2 e
France	7.7	10.4	10.6	10.8	11.0	11.4 e p	11.7 e
Germany	6.9	9.2	9.5	9.7	10.0	10.0 e	10.2 e p
Greece	4.2 d	6.6 d	7.9 d	8.1 d	8.6 d	9.6 d e	9.6 d e p
Hungary	3.9	5.8	6.2	8.1 d	8.3 d e	9.0 d e	9.2 e
Iceland	13.3	..	10.4	..	..	..	13.0 e
Ireland	5.9	11.7 e	11.4 e	10.3 e	10.3	10.8 e	..
Israel	..	..	..	..	..	..	..
Italy	3.4 d	5.4 b d	5.6 d	6.0 d	6.3 d	6.3 d e	6.9 e
Japan	10.4 d	10.1 d	10.1 d	10.0 b d	9.9 d	10.1 d e	10.3 d e
Korea	7.9 d	13.7	14.3	15.2	15.9 e	16.6 e	17.3 e
Latvia	3.4 d	3.6 d	3.9 d	3.8 d	4.0 d e	4.6 d e	5.3 e p
Lithuania	5	6	6	6	7 e	7 e	8 e
Luxembourg	7.2	6.6	6.8	6.4	6.7 e	6.2 e p	6.6 e p
Mexico	1.3	1.0	1.0 e	1.0 e	1.1 e	1.2 e	..
Netherlands	5.7	9.8	9.9	10.2	10.2 e	10.7 e	10.9 e p
New Zealand	6.3	..	9.5	..	10.7 e	..	..
Norway	9.1	11.8	12.2	12.3	12.7 e	13.0 e	13.7 e p
Poland	4.4	5.5	7.0 d	7.2 d	7.4 d e	7.6 d e	8.1 e p
Portugal	4.2	8.9	9.4	9.7	10.1 e	10.9 e	11.3 e p
Slovak Republic	5.2 d	6.1 d	6.4 d	6.8 d	6.9 d	7.2 d e	7.3 e
Slovenia	5.6	8.4	9.4 d	9.9 d	10.0 d e	10.4 d e	10.5 e p
Spain	5.6	6.7 d	6.9 d	7.1 d	7.1 d e	7.5 d e	7.7 e p
Sweden	12.7 b e	14.4 e	14.6	14.7 e	15.3	15.8 e	16.5 e
Switzerland	..	..	8.8	..	9.4 e	..	..
Türkiye	2.0	3.7	4.0	4.4	4.9	5.7 e	5.9 e
United Kingdom	8.6 b e	9.2 e	9.2	..	..	..	..
United States	7.3 e	8.1 e	8.4 e	8.9 e	9.0 e	10.0 e	..
EU27 (from 01/02/2020)	5.9 e	8.0 e	8.4 e	8.6 e	8.9 e	9.1 e	9.5 e
<b>OECD-Total</b>	<b>7.1 e</b>	<b>8.4 e</b>	<b>8.6 e</b>	<b>9.0 e</b>	<b>9.2 e</b>	<b>9.7 e</b>	<b>..</b>
Argentina	2.1	3.1	3.0	3.0	3.0	3.3	..
China	1.5 d	2.2	2.3	2.5	..	..	..
Romania	2.5	2.1	2.0	2.0	2.0	2.2	2.2 p
Russian Federation	6.8	5.9	5.7	5.6	5.6	5.6	..
Singapore	10.3	10.7	10.6	10.6	11.2	11.8	..
South Africa	1.4	1.8	1.8	1.8	1.7	..	..
Chinese Taipei	8.9	13.1	13.2	13.5	13.8	14.2	14.7

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>Source: OECD, *Main Science and Technology Indicators database*

**Table 9. Total R&D personnel in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	47 625 d e	75 165 d e	76 010 d	80 198 d e	83 660 d	82 053 d e	87 049 d e
Belgium	53 517	79 109 e	82 686	88 594	93 524	96 828 e	119 466 d p
Canada	218 590	228 590	231 850	250 760	256 120	..	..
Chile	..	16 626 d	16 608 d	16 848 d e	16 422 d e	16 348 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	43 370 b	65 783	69 736	74 969	79 245	80 958	84 671 p
Denmark	43 499	62 859	60 240	59 778	62 229 p	62 049 p	62 169 p
Estonia	4 362	5 772	6 048	6 183	6 394	6 449	6 783 p
Finland	57 471	47 429	48 999	50 011	51 494	53 519	56 488
France	349 681	432 245	442 222	453 387	461 891	470 586 e p	501 053
Germany	475 278	657 894	686 349	707 704	735 584	733 831	749 851 p
Greece	33 603 d	41 790 d	47 585 d	51 279 d	53 932 d	58 103 d	60 537 d p
Hungary	23 239	35 757	40 432	54 654 d	56 943 d	59 628 d	61 149
Iceland	3 226	..	3 172	..	..	..	4 414
Ireland	16 690	34 373 e	33 803 e	31 396 e	32 170	32 757 e	..
Israel	..	..	..	..	..	..	..
Italy	175 248 d	290 040 b d	317 628 d	345 625 d	355 854 d	342 286 d	357 696
Japan	896 855 d	872 340 d	890 749 d	896 901 b d	903 367 d	911 620 d	942 024 d
Korea	215 345 d	447 408	471 201	501 175	525 675	545 435	577 099
Latvia	5 483 d	5 120 d	5 378 d	5 806 d	5 924 d	6 559 d	7 054 p
Lithuania	11 002	10 924	11 577	11 956	12 998	14 245	14 891
Luxembourg	4 392	5 403	5 545	5 468	5 790	5 562 e p	6 028 p
Mexico	83 685	65 828	65 412 e	64 602 e	66 889 e	69 988 e	..
Netherlands	93 599	144 482	150 399	156 875	160 422	166 422	172 436 p
New Zealand	18 929	..	34 000	..	39 000	..	..
Norway	29 966	43 918	46 234	46 601	48 723	48 947	51 660 p
Poland	76 761	111 789	144 103 d	161 993 d	164 006 d	173 392 d	185 313 p
Portugal	25 728	50 406	54 995	58 154	61 455	66 044	69 628 p
Slovak Republic	14 404 d	17 768 d	19 011 d	20 268 d	21 196 d	22 405 d	22 358
Slovenia	8 994	14 403	14 713 d	15 686 d	16 983 d	16 833 d	17 451 p
Spain	174 773	205 873 d	215 744 d	225 696 d	231 413 d	231 769 d	249 473 p
Sweden	77 557 b e	90 690 e	88 928 v	92 011 e	92 172 e v	95 463	98 393
Switzerland	..	..	78 908	..	85 853	..	..
Türkiye	49 251 e	136 953	153 552	172 119	182 847	199 371	221 811
United Kingdom	324 917 b e	423 815 e	444 619	..	..	..	..
United States	..	..	..	..	..	2 415 108 e	..
EU27 (from 01/02/2020)	1 876 603 e	2 556 322 e	2 692 860 e	2 831 818 e	2 921 548 e	2 956 603 e	3 105 763 e
<b>OECD-Total</b>	<b>..</b>	<b>7 355 838 e</b>	<b>7 687 607 e</b>	<b>8 110 410 e</b>	<b>8 341 058 e</b>	<b>8 505 909 e</b>	<b>..</b>
Argentina	45 361	81 030	80 009	83 856	86 069	85 651	..
China	1 364 799 d	3 878 057	4 033 597	4 381 444	..	..	..
Romania	33 222	32 232	32 586	31 933	31 665	33 189	34 270 p
Russian Federation	919 716	802 317	778 155	758 462	753 796	748 721	..
Singapore	28 586	45 096	44 515	44 816	48 715	49 334	..
South Africa	28 798	42 533	44 259	43 774	41 856	..	..
Chinese Taipei	149 154	250 495	255 229	262 307	271 579	279 647	287 410

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 10. Total R&D personnel in full-time equivalent per thousand total employment**

Per thousand

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	12.3 d e	17.3 d e	17.2 d	17.9 d e	18.4 d e	18.4 d e	19.1 d e
Belgium	12.5	16.9 e	17.4	18.4	19.1	19.8 e	23.9 d e p
Canada	13.3	12.5	12.4	13.2	13.2	..	..
Chile	..	2.0 d	2.0 d	2.0 d e	1.9 d e	2.2 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	8.8 b	12.5	13.0	13.8	14.6	15.2 e	15.8 e p
Denmark	15.6	21.9	20.6	20.2	20.7 e p	20.9 e p	20.4 e p
Estonia	7.1	9.2	9.4	9.5	9.9 e	10.0 e	10.5 e p
Finland	23.8	18.7	19.1	19.0	19.3 e	20.4 e	21.0 e
France	13.3	15.7	15.9	16.1	16.2	16.6 e p	17.3 e
Germany	12.1	15.1	15.5	15.8	16.2	16.3 e	16.7 e p
Greece	7.2 d	9.4 d	10.7 d	11.4 d	11.8 d	13.0 d e	13.1 d e p
Hungary	5.6	8.0	8.9	11.7 d	12.1 d e	12.8 d e	13.0 e
Iceland	19.9	..	16.1	..	..	..	22.4 e
Ireland	8.5	16.5 e	15.8 e	14.2 e	14.1	14.8 e	..
Israel	..	..	..	..	..	..	..
Italy	7.1 d	11.7 b d	12.6 d	13.6 d	14.0 d	13.7 d e	14.3 e
Japan	13.7 d	13.2 d	13.3 d	13.2 b d	13.2 d	13.4 d e	13.8 d e
Korea	9.4 d	16.9	17.6	18.7	19.4 e	20.3 e	21.2 e
Latvia	5.7 d	5.8 d	6.1 d	6.4 d	6.6 d e	7.5 d e	8.2 e p
Lithuania	8	8	9	9	9 e	10 e	11 e
Luxembourg	14.3	12.9	12.8	12.2	12.5 e	11.8 e p	12.4 e p
Mexico	2.6	1.7	1.7 e	1.6 e	1.7 e	1.9 e	..
Netherlands	11.2	16.2	16.4	16.7	16.7 e	17.4 e	17.7 e p
New Zealand	9.2	..	13.4	..	14.9 e	..	..
Norway	12.9	16.2	16.8	16.7	17.2 e	17.5 e	18.3 e p
Poland	5.5	6.9	8.8 d	9.9 d	10.0 d e	10.6 d e	11.0 e p
Portugal	5.1	10.8	11.5	11.8	12.4 e	13.6 e	14.0 e p
Slovak Republic	6.9 d	7.7 d	8.0 d	8.4 d	8.7 d	9.3 d e	9.4 e
Slovenia	9.7	15.0	14.9 d	15.4 d	16.2 d e	16.2 d e	16.6 e p
Spain	8.9	10.9 d	11.1 d	11.4 d	11.4 d e	11.9 d e	12.5 e p
Sweden	17.9 b e	18.5 e	17.7 v	18.0 e	18.0 e v	18.9 e	19.2 e
Switzerland	..	..	15.8	..	16.9 e	..	..
Türkiye	2.5 e	5.1	5.5	6.0	6.6	7.5 e	7.8 e
United Kingdom	11.3 b e	13.4 e	13.9	..	..	..	..
United States	..	..	..	..	..	16.1 e	..
EU27 (from 01/02/2020)	9.8 e	12.7 e	13.2 e	13.7 e	14.0 e	14.3 e	14.8 e
<b>OECD-Total</b>	<b>..</b>	<b>12.6 e</b>	<b>13.0 e</b>	<b>13.5 e</b>	<b>13.8 e</b>	<b>14.5 e</b>	<b>..</b>
Argentina	2.9	4.6	4.5	4.6	4.7	5.0	..
China	1.8 d	5.1	5.3	5.8	..	..	..
Romania	3.6	3.8	3.8	3.7	3.7	3.9	4.0 p
Russian Federation	13.5	11.1	10.8	10.5	10.5	10.6	..
Singapore	12.3	12.3	12.1	12.1	12.9	13.7	..
South Africa	2.3	2.7	2.7	2.7	2.6	..	..
Chinese Taipei	15.0	22.2	22.5	22.9	23.6	24.3	25.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 11. Business-financed GERD (Gross domestic expenditure on R&D) as a percentage of GDP***As a percentage of GDP*

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	1.08 e	1.65 e	1.67	1.64 e	1.72	1.59 e	1.61 p
Belgium	1.07	..	1.69	..	2.03	..	..
Canada	0.97	0.74	0.73	0.77	0.77	0.82	0.75 p
Chile	..	0.13 b	0.11	0.11 e	0.11 e	0.12 e	..
Colombia	0.04	0.11	0.10	0.14	0.16 e	0.15 e	..
Czech Republic	0.56	0.66	0.70	0.76	0.74	0.71	0.72 p
Denmark	1.42	..	1.67	..	1.72	..	..
Estonia	0.35	0.60	0.56	0.58	0.80	0.88	..
Finland	2.22	1.55	1.58	1.54	1.52	1.63	..
France	1.07	1.24	1.24 s	1.24 s	1.24	1.31	..
Germany	1.65 d	1.92 d	2.02 d	2.05 d	2.04 d	1.96 e	..
Greece	0.18	0.40	0.52	0.52	0.53	0.60	0.56 p
Hungary	0.36 d	0.67	0.69	0.79 b	0.78	0.80	..
Iceland	1.29	..	..	..	..	..	..
Ireland	0.68	0.58 e	0.64 e	0.59 e p	0.77 e p	..	..
Israel	2.21 d	1.71 d	1.63 d	1.77 d	1.92 d	2.28 d	..
Italy	0.41	0.71 b	0.74	0.78	0.82	0.80	..
Japan	2.38	2.43	2.48	2.55 b	2.54	2.56	2.57
Korea	1.89 d	3.01	3.27	3.46	3.56	3.67	3.75
Latvia	0.18	0.09	0.12	0.14	0.15	0.19	..
Lithuania	0	0	0	0	0	0	..
Luxembourg	1.24	..	0.61	..	0.61	..	..
Mexico	0.17	0.07	0.06 e	0.05 e	0.05 e	0.05 e	..
Netherlands	0.82	1.20	1.23	1.21	1.26	1.32	..
New Zealand	0.46	..	0.62	..	0.70 p	..	..
Norway	0.69	0.88	0.89	0.86	0.92	1.00	..
Poland	0.19	0.51	0.55	0.64	0.67	0.70	..
Portugal	0.27	0.57	0.61	0.64	0.67	0.84	..
Slovak Republic	0.18	0.36	0.43	0.41	0.38	0.39	..
Slovenia	0.78	1.39	1.18	1.22	1.26	1.06	..
Spain	0.51	0.56	0.58	0.61	0.61	0.69	..
Sweden	2.15 b	..	2.04	..	2.11	..	..
Switzerland	..	..	1.98	..	2.06	..	..
Türkiye	0.24 d	0.44	0.47	0.55	0.60	0.62	0.71
United Kingdom	0.65	..	..	1.57 b e p	1.57 p	1.68 p	..
United States	1.59 d	1.83	1.84	1.93	2.08	2.30	2.35 p
EU27 (from 01/02/2020)	0.93 e	1.15 e	1.19 e	1.22 e	1.23 e	1.25 e	..
<b>OECD-Total</b>	<b>1.34 e</b>	<b>1.49 e</b>	<b>1.52 e</b>	<b>1.58 e</b>	<b>1.64 e</b>	<b>1.75 e</b>	..
Argentina	0.13	0.10	0.10	0.11	0.11	0.12	..
China	0.88	1.60	1.62	1.64	..	..	..
Romania	0.15	0.24	0.27	0.29	0.26	0.26	..
Russian Federation	0.30	0.31	0.33	0.29	0.31	0.32	..
Singapore	1.26	1.07	0.98	0.95	1.05	1.29	..
South Africa	0.38	0.32	0.35	0.30	0.18	..	..
Chinese Taipei	1.56	2.40	2.53	2.69	2.83	2.99	3.18

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 12. Government-financed GERD (Gross domestic expenditure on R&D) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	0.85 e	0.95 d e	0.84	0.94 d e	0.84	1.07 d e	1.04 p
Belgium	0.44	..	0.53	..	0.56	..	..
Canada	0.63 e	0.53 e	0.55 e	0.54 e	0.55 e	0.60 e	0.52 e p
Chile	..	0.17 b	0.17	0.18 e	0.15 e	0.13 e	..
Colombia	0.07	0.09	0.10	0.08	0.08 e	0.07 e	..
Czech Republic	0.52	0.59	0.61	0.65	0.65	0.68	0.65 p
Denmark	0.66	..	0.83 d	..	0.83 d	..	..
Estonia	0.40	0.47	0.51	0.60	0.61	0.65	..
Finland	0.85	0.79	0.79	0.78	0.78	0.81	..
France	0.79	0.72	0.71 s	0.69 s	0.69	0.73	..
Germany	0.69 d	0.84 d	0.84 d	0.87 d	0.88 d	0.93 e	..
Greece	0.27	0.43	0.43	0.49	0.52	0.64	0.64 p
Hungary	0.45 d	0.31	0.42	0.49 b	0.49	0.52	..
Iceland	1.09	..	..	..	..	..	..
Ireland	0.38	0.30 e	0.30 e	0.29 e p	0.28 e p	..	..
Israel	0.57 d	0.50 d	0.51 d	0.51 d	0.50 d	0.51 d	..
Italy	0.53	0.48 b	0.44	0.47	0.47	0.51	..
Japan	0.52 e	0.47 e	0.47 e	0.47 b e	0.47 e	0.50 e	0.51 e
Korea	0.58 d	0.90	0.93	0.93	0.96	1.07	1.12
Latvia	0.24	0.21	0.22	0.22	0.23	0.26	..
Lithuania	0	0	0	0	0	0	..
Luxembourg	0.26	..	0.53	..	0.51	..	..
Mexico	0.20	0.30	0.25 e	0.24 e	0.22 e	0.23 e	..
Netherlands	0.69	0.65	0.64	0.63	0.64	0.70	..
New Zealand	0.48	..	0.49	..	0.44 p	..	..
Norway	0.64	0.93	0.97	0.98	1.00	1.04	..
Poland	0.32	0.38	0.40	0.43	0.51	0.54	..
Portugal	0.42	0.55	0.54	0.55	0.56	0.60	..
Slovak Republic	0.28 e	0.32	0.31	0.32	0.33	0.36	..
Slovenia	0.53	0.41	0.43	0.46	0.50	0.54	..
Spain	0.47	0.48	0.47	0.47	0.47	0.54	..
Sweden	0.82 b	..	0.84	..	0.82	..	..
Switzerland	..	..	0.85	..	0.87	..	..
Türkiye	0.28 d	0.33	0.32	0.33	0.31	0.31	0.28
United Kingdom	0.51	..	..	0.49 b e p	0.48 p	0.57 p	..
United States	0.76 d	0.66 d	0.66 d	0.67 d	0.67 d	0.74 d	0.69 d p
EU27 (from 01/02/2020)	0.60 e	0.62 e	0.61 e	0.62 e	0.63 e	0.67 e	..
<b>OECD-Total</b>	<b>0.62 e</b>	<b>0.60 e</b>	<b>0.59 e</b>	<b>0.60 e</b>	<b>0.60 e</b>	<b>0.66 e</b>	..
Argentina	0.27	0.39	0.39	0.32	0.29	0.31	..
China	0.34	0.42	0.42	0.43	..	..	..
Romania	0.22	0.19	0.18	0.17	0.16	0.15	..
Russian Federation	0.62	0.75	0.73	0.66	0.69	0.74	..
Singapore	0.77	0.82	0.72	0.69	0.69	0.76	..
South Africa	0.33	0.38	0.39	0.36	0.38	..	..
Chinese Taipei	0.74	0.66	0.63	0.63	0.63	0.61	0.57

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 13. Percentage of Gross domestic expenditure on R&D (GERD) financed by the business enterprise sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	45.6 e	53.0 e	54.7	53.1 e	54.8	49.8 e	50.6 p
Belgium	59.7	..	63.5	..	64.3	..	..
Canada	49.3	42.7	43.1	44.3	43.9	43.3	44.0 p
Chile	..	35.1 b	31.4	30.7 e	31.0 e	34.7 e	..
Colombia	23.8	41.0	38.1	45.0	49.3 e	53.4 e	..
Czech Republic	48.2	39.5	39.3	39.9	38.2	35.6	36.1 p
Denmark	59.5	..	57.1	..	59.2	..	..
Estonia	38.5	48.2	43.6	40.8	49.1	50.1	..
Finland	66.9	57.0	58.0	55.8	54.3	56.0	..
France	51.9	56.0	56.2 s	56.6 s	56.7	56.8	..
Germany	67.5 d	65.2 d	66.2 d	66.0 d	64.5 d	62.6 e	..
Greece	31.1	40.2	44.8	42.5	41.4	39.9	38.4 p
Hungary	39.4 d	56.4	52.7	52.4 b	52.9	50.2	..
Iceland	48.0	..	..	..	..	..	..
Ireland	57.4	49.0 e	51.3 e	50.5 e p	62.8 e p	..	..
Israel	56.2 d	38.2 d	35.3 d	37.1 d	36.9 d	40.0 d	..
Italy	39.7	52.1 b	53.7	54.5	55.9	52.8	..
Japan	76.1	78.1	78.3	79.1 b	78.9	78.3	78.1
Korea	75.0 d	75.4	76.2	76.6	76.9	76.6	76.1
Latvia	34.3	21.6	24.1	22.3	24.3	27.0	..
Lithuania	21	39	35	38	34	37	..
Luxembourg	79.7	..	49.6	..	51.3	..	..
Mexico	41.5	18.8	19.1 e	17.5 e	18.2 e	17.8 e	..
Netherlands	46.3	55.8	56.4	56.7	57.6	56.9	..
New Zealand	41.1	..	46.0	..	49.9 p	..	..
Norway	46.8	43.2	42.8	42.0	43.2	44.5	..
Poland	33.4	53.1	52.5	53.2	50.7	50.6	..
Portugal	36.3	44.4	46.5	47.3	48.3	52.2	..
Slovak Republic	36.6	46.2	49.0	48.8	46.8	43.7	..
Slovenia	54.8	69.2	63.1	62.6	61.5	49.5	..
Spain	46.3	46.7	47.8	49.5	49.1	49.2	..
Sweden	63.9 b	..	60.8 v	..	62.4 v	..	..
Switzerland	..	..	64.5	..	64.7	..	..
Türkiye	43.3 d	46.7	49.4	53.6	56.3	57.2	62.4
United Kingdom	42.1	..	..	58.2 b e p	59.0 p	57.5 p	..
United States	63.7 d	64.0 b d	63.4 d	64.1 d	65.7 d	66.3 d	67.9 d p
EU27 (from 01/02/2020)	55.5 e	57.6 e	58.5 e	58.6 e	58.3 e	57.1 e	..
<b>OECD-Total</b>	<b>62.5 e</b>	<b>62.7 e</b>	<b>62.8 e</b>	<b>63.3 e</b>	<b>63.9 e</b>	<b>63.8 e</b>	..
Argentina	31.0	18.2	17.8	21.3	23.6	23.4	..
China	67.0	76.1	76.5	76.6	..	..	..
Romania	37.2	49.4	54.4	57.1	54.6	55.6	..
Russian Federation	30.0	28.1	30.2	29.5	30.2	29.2	..
Singapore	58.6	51.4	51.8	52.2	55.4	58.3	..
South Africa	43.9	39.4	41.5	39.5	27.1	..	..
Chinese Taipei	66.9	77.6	79.2	80.3	81.0	82.5	84.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 14. Percentage of Gross domestic expenditure on R&D (GERD) financed by government**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	35.9 e	30.3 d e	27.6	30.3 d e	27.0	33.3 d e	32.8 p
Belgium	24.7	..	20.0	..	17.8	..	..
Canada	31.8 e	30.9 e	32.4 e	31.3 e	31.5 e	31.7 e	30.9 e p
Chile	..	45.5 b	47.1	47.7 e	45.3 e	39.3 e	..
Colombia	43.0	35.0	36.9	26.8	23.8 e	25.0 e	..
Czech Republic	45.2	35.6	34.6	34.1	33.7	34.0	32.3 p
Denmark	27.6	..	28.3 d	..	28.7 d	..	..
Estonia	43.5	37.6	40.2	42.8	37.2	37.0	..
Finland	25.7	28.9	29.0	28.3	27.8	27.7	..
France	38.6	32.4	32.5 s	31.5 s	31.4	31.5	..
Germany	28.5 d	28.5 d	27.7 d	27.8 d	27.8 d	29.7 e	..
Greece	46.8	42.6	37.6	40.6	41.1	42.7	44.1 p
Hungary	49.4 d	26.2	31.9	32.3 b	33.3	32.5	..
Iceland	40.5	..	..	..	..	..	..
Ireland	32.0	25.8 e	23.8 e	24.7 e p	22.6 e p	..	..
Israel	14.5 d	11.1 d	11.0 d	10.6 d	9.5 d	8.9 d	..
Italy	50.7	35.2 b	32.3	32.8	32.3	33.7	..
Japan	16.8 e	15.0 e	15.0 e	14.6 b e	14.7 e	15.2 e	15.5 e
Korea	23.0 d	22.7	21.6	20.6	20.7	22.4	22.8
Latvia	46.0	47.7	43.6	34.3	35.4	38.1	..
Lithuania	63	39	36	32	32	29	..
Luxembourg	16.6	..	43.1	..	43.2	..	..
Mexico	49.2	77.6	76.8 e	78.2 e	76.7 e	76.9 e	..
Netherlands	38.8	30.2	29.4	29.6	29.4	30.3	..
New Zealand	43.2	..	36.3	..	31.1 p	..	..
Norway	43.6	45.7	46.7	48.0	47.0	46.1	..
Poland	57.7	38.9	38.3	35.4	38.8	39.0	..
Portugal	55.2	42.6	41.0	40.6	40.2	37.3	..
Slovak Republic	57.0 e	41.0	35.5	38.0	40.5	39.6	..
Slovenia	37.2	20.2	22.9	23.7	24.7	25.1	..
Spain	43.0	40.0	38.9	37.6	37.9	38.5	..
Sweden	24.4 b	..	25.0 v	..	24.2 v	..	..
Switzerland	..	..	27.7	..	27.4	..	..
Türkiye	50.1 d	35.1	33.6	32.3	29.4	28.4	25.1
United Kingdom	32.7	..	..	18.2 b e p	18.0 p	19.5 p	..
United States	30.4 d	23.3 b d	22.8 d	22.3 d	21.1 d	21.2 d	19.9 d p
EU27 (from 01/02/2020)	35.6 e	31.2 e	30.1 e	30.0 e	29.8 e	30.8 e	..
<b>OECD-Total</b>	<b>29.0 e</b>	<b>25.2 e</b>	<b>24.6 e</b>	<b>24.2 e</b>	<b>23.6 e</b>	<b>24.0 e</b>	..
Argentina	65.3	73.1	70.7	65.1	60.7	59.2	..
China	26.3	20.0	19.8	20.2	..	..	..
Romania	53.5	39.6	35.9	33.3	34.4	32.9	..
Russian Federation	61.9	68.2	66.2	67.0	66.3	67.8	..
Singapore	35.7	39.3	37.8	37.9	36.4	34.3	..
South Africa	38.2	46.0	46.7	47.5	56.3	..	..
Chinese Taipei	31.5	21.4	19.8	18.8	18.1	16.8	15.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 15. Percentage of Gross domestic expenditure on R&D (GERD) financed by the Higher Education and PNP sectors**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	0.4 e	0.5 d e	1.1	0.3 d e	1.2	0.3 d e	0.3 p
Belgium	3.3	..	3.5	..	3.2	..	..
Canada	10.1 e	15.7 e	15.7 e	15.3 e	14.3 e	15.1 e	15.0 e p
Chile	..	15.5 b	17.1	17.0 e	18.2 e	23.9 e	..
Colombia	29.0	18.2	19.9	23.9	21.0 e	16.4 e	..
Czech Republic	1.2	0.9	1.1	1.1	1.1	1.3	1.1 p
Denmark	2.8 d	..	5.4 d	..	6.5 d	..	..
Estonia	1.0	0.6	1.3	1.7	0.4	0.5	..
Finland	1.2	2.0	2.2	2.0	2.4	2.3	..
France	1.9	3.8	3.7 s	4.0 s	3.8	4.0	..
Germany	0.3 d	0.3 d	0.3 d	0.3 d	0.4 d	0.4 e	..
Greece	3.1	2.7	2.6	2.5	2.8	3.0	2.9 p
Hungary	0.3 d	0.7	0.5	0.5 b	0.7	0.7	..
Iceland	0.3	3.8 e	3.2	3.3 e	0.8	0.1 e	4.6 b
Ireland	1.9	1.5 e	1.5 e	1.6 e p	1.3 e p	..	..
Israel	4.6 d	1.5 d	1.1 d	1.1 d	0.9 d	0.8 d	..
Italy	1.7	2.9 b	2.3	2.2	2.1	2.2	..
Japan	6.8 e	6.2 e	6.1 e	5.8 b e	5.8 e	6.0 e	5.9 e
Korea	1.3 d	1.0	0.9	0.9	0.8	0.8	0.8
Latvia	1.2	2.9	2.5	1.8	1.7	1.7	..
Lithuania	6	3	4	3	3	3	..
Luxembourg	0.1	..	1.6	..	1.6	..	..
Mexico	8.2	2.9	3.3 e	3.5 e	4.0 e	4.1 e	..
Netherlands	2.8	2.5	2.3	2.5	2.6	2.5	..
New Zealand	10.6	..	10.0	..	9.8 p	..	..
Norway	1.6	1.7	1.7	1.7	1.6	1.5	..
Poland	3.2	2.6	3.2	4.4	3.5	3.2	..
Portugal	3.8	4.9	5.1	4.9	4.7	4.0	..
Slovak Republic	0.3	2.1	1.7	1.9	2.1	2.4	..
Slovenia	0.7	0.4	0.9	0.6	0.5	0.8	..
Spain	5.0	5.2	5.1	5.0	4.8	4.6	..
Sweden	3.6 b	..	4.0 v	..	4.2 v	..	..
Switzerland	..	..	2.0	..	1.9	..	..
Türkiye	5.8 d	14.5	13.5	12.1	12.8	12.4	10.6
United Kingdom	5.9	..	..	12.1 b e p	11.9 p	11.1 p	..
United States	5.9 d	7.0 b d	6.8 d	6.5 d	6.1 d	5.8 d	5.5 d p
EU27 (from 01/02/2020)	1.7 e	..	2.2 e	..	2.2 e	..	..
<b>OECD-Total</b>	<b>5.3 e</b>	<b>5.6 e</b>	<b>5.5 e</b>	<b>5.3 e</b>	<b>5.1 e</b>	<b>5.0 e</b>	<b>..</b>
Argentina	2.9	2.4	2.3	2.5	2.5	2.6	..
China	..	..	..	..	..	..	..
Romania	4.0	1.2	1.7	0.6	0.5	0.6	..
Russian Federation	0.5	1.0	1.0	1.1	1.1	1.2	..
Singapore	1.3	3.0	3.3	3.0	3.0	3.0	..
South Africa	4.4	2.9	1.6	2.1	3.0	..	..
Chinese Taipei	1.4	0.8	0.8	0.7	0.7	0.6	0.6

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 16. Percentage of Gross domestic expenditure on R&D (GERD) financed by the rest of the world**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	18.0 e	16.2 e	16.6	16.3 e	17.0	16.6 e	16.4 p
Belgium	12.4	..	13.0	..	14.7	..	..
Canada	8.8	10.8	8.8	9.1	10.2	9.9	10.1 p
Chile	..	3.9 b	4.5	4.7 e	5.5 e	2.1 e	..
Colombia	4.2	5.8	5.2	4.2	5.9 e	5.2 e	..
Czech Republic	5.4	24.0	25.0	24.9	27.0	29.1	30.5 p
Denmark	10.1	..	9.2	..	5.6	..	..
Estonia	17.1	13.6	15.0	14.7	13.3	12.4	..
Finland	6.3 b	12.1	10.8	13.9	15.5	14.1	..
France	7.5	7.8	7.8 s	7.7 s	8.1	7.7	..
Germany	3.7 d	5.9 d	5.8 d	5.8 d	7.4 d	7.3 e	..
Greece	19.0	14.6	15.0	14.3	14.6	14.4	14.6 p
Hungary	10.7 d	16.6	14.9	14.8 b	13.1	16.6	..
Iceland	11.2	21.4 e	24.5	18.6 e	30.5	30.9 e	21.5 b
Ireland	8.6	23.6 e	23.3 e	23.2 e p	13.3 e p	..	..
Israel	24.7 d	49.2 d	52.6 d	51.2 d	52.7 d	50.2 d	..
Italy	8.0	9.8 b	11.7	10.5	9.6	11.3	..
Japan	0.3	0.7	0.6	0.6 b	0.6	0.5	0.6
Korea	0.7 d	0.9	1.3	1.9	1.6	0.2	0.3
Latvia	18.5	27.8	29.8	41.5	38.6	33.2	..
Lithuania	10.5	19.2	24.4	26.2	30.6	31.0	..
Luxembourg	3.6	..	5.7	..	3.9	..	..
Mexico	1.1	0.7	0.9 e	0.9 e	1.1 e	1.3 e	..
Netherlands	12.0	11.5	11.9	11.2	10.4	10.4	..
New Zealand	5.2	..	7.0	..	9.1 p	..	..
Norway	8.1	9.5	8.8	8.2	8.2	7.8	..
Poland	5.7	5.5	6.0	7.0	7.0	7.2	..
Portugal	4.7	8.0	7.3	7.2	6.8	6.5	..
Slovak Republic	6.0	10.7	13.7	11.2	10.7	14.3	..
Slovenia	7.3	10.2	13.1	13.1	13.3	24.6	..
Spain	5.7	8.1	8.2	7.9	8.2	7.7	..
Sweden	8.1 b	..	10.1 v	..	8.8 v	..	..
Switzerland	..	..	5.8	..	6.0	..	..
Türkiye	0.8	3.7	3.5	2.0	1.5	2.0	1.9
United Kingdom	19.3	..	..	11.6 b e p	11.2 p	11.9 p	..
United States	.. k	5.7 b d	7.0 d	7.1 d	7.1 d	6.6 d	6.7 d p
EU27 (from 01/02/2020)	7.1 e	9.0 e	9.2 e	9.1 e	9.6 e	9.8 e	..
<b>OECD-Total</b>	<b>..</b>	<b>6.5 e</b>	<b>7.1 e</b>	<b>7.1 e</b>	<b>7.4 e</b>	<b>7.1 e</b>	<b>..</b>
Argentina	0.8	6.3	9.2	11.1	13.1	14.8	..
China	0.9	0.7	0.6	0.4	..	..	..
Romania	5.3	9.9	7.9	9.0	10.6	10.9	..
Russian Federation	7.6	2.7	2.6	2.3	2.4	1.8	..
Singapore	4.4	6.3	7.1	6.9	5.2	4.4	..
South Africa	13.6	11.7	10.2	10.9	13.5	..	..
Chinese Taipei	0.2	0.2	0.2	0.1	0.1	0.1	0.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 17. Percentage of Gross domestic expenditure on R&D (GERD) performed by the business enterprise sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	52.7 e	..	51.0 e	..	..
Austria	69.8 e	70.2 b e	69.9	69.9 e	70.3	69.5 e	69.5 e p
Belgium	68.0	68.6	70.2	71.7	73.7	73.9 e	75.4 p
Canada	55.8 d	53.5	52.7	53.7	54.0	54.1	55.0 p
Chile	..	37.7 b	34.2	33.5 e	33.6 e	35.6 e	..
Colombia	18.8	39.8	35.1	42.1	47.5 e	51.6 e	..
Czech Republic	58.2 b	61.1	62.9	61.9	61.6	61.0	62.8 p
Denmark	68.3	65.1	63.4	63.1	62.1	61.6	62.1 p
Estonia	45.1	51.5	47.2	42.3	53.3	55.0	55.8 p
Finland	70.8	65.8	65.3	65.7	65.6	67.0	68.8
France	62.1	65.1	65.4	65.5	65.9	66.0	65.6
Germany	69.2	68.2	69.1	68.9	68.9	66.6 e	66.6 p
Greece	31.0	42.2	48.8	48.2	46.1	46.1	47.3 p
Hungary	43.2 d	74.1 d	73.1 d	75.6 b d	75.1 d	76.5 d	75.5 d
Iceland	51.5	64.4 d e	64.3 d	64.3 d e	68.7 d	67.9 d e	71.7 d
Ireland	65.5	72.2 e	74.3 e	72.9 e p	74.5 e p	73.8 e p	79.7 b p
Israel	81.5 d	86.5 d	87.8 d	88.0 d	89.4 d	90.4 d	91.0 d e
Italy	50.4	60.8 b	62.4	63.1	63.2	61.8	61.4
Japan	76.4	78.8	78.8	79.4 b	79.2	78.7	78.6
Korea	76.9 d	77.7	79.4	80.3	80.3	79.1	79.1
Latvia	40.7	24.5	27.2	24.9	26.3	30.9	32.8 p
Lithuania	20.4	35.0	36.8	41.8	43.2	47.0	49.0
Luxembourg	86.4	55.5	55.8	53.2	54.3	51.3 e p	46.4 p
Mexico	46.9	22.2	22.5 e	21.1 e	21.8 e	21.5 e	..
Netherlands	52.9	65.7	66.3	66.4	66.7	66.6	67.5 p
New Zealand	41.6	..	54.4	..	59.6 p	..	..
Norway	53.5	53.3	52.6	51.5	53.0	54.3	53.9 p
Poland	31.8	65.7 b	64.5	66.1	62.8	62.8	63.1 p
Portugal	38.5	48.4	50.4	51.4	52.5	57.0	59.2 p
Slovak Republic	49.8	50.4	54.1	54.1	54.8	54.1	56.0
Slovenia	58.8	75.7	74.8	74.2	73.8	73.3	73.4 p
Spain	53.8	53.7	55.0	56.5	56.1	55.6	56.2 p
Sweden	72.8 b	69.6 e	71.3 v	71.0 e	71.7 v	72.3	71.9
Switzerland	..	..	67.1	..	67.5	..	..
Türkiye	33.8	54.2	56.9	60.4	64.2	64.8	70.7
United Kingdom	61.4	77.1 e p	77.1 e p	70.2 b e p	70.7 p	71.2 p	..
United States	69.3 d	73.2 b d	73.6 d	74.1 d	75.0 d	76.0 d	77.6 d p
EU27 (from 01/02/2020)	62.3 e	65.2 e	66.0 e	66.2 e	66.2 e	65.4 e	65.6 e
<b>OECD-Total</b>	<b>67.8 e</b>	<b>70.3 e</b>	<b>70.9 e</b>	<b>71.4 e</b>	<b>71.9 e</b>	<b>72.1 e</b>	<b>73.3 e</b>
Argentina	32.2	23.9	27.1	31.3	36.2	37.8	..
China	68.3	77.5	77.6	77.4	..	..	..
Romania	49.7	55.2	56.7	59.3	57.8	59.0	60.4 p
Russian Federation	68.0	58.7	60.1	55.6	60.7	56.6	..
Singapore	66.1	58.0	59.2	59.6	61.1	63.4	..
South Africa	58.3	41.4	41.0	39.3	31.0	..	..
Chinese Taipei	67.0	77.5	79.0	80.3	80.9	82.5	84.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 18. Percentage of Gross domestic expenditure on R&D (GERD) performed by the higher education sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	34.0 e	..	35.7 e	..	..
Austria	24.7 e	22.2 b e	22.4	22.4 e	21.8	22.4 e	22.4 e p
Belgium	22.3	21.2	19.8	18.4	16.7	16.9 e	15.3 p
Canada	34.0	39.4	39.8	38.9	38.9	37.9	37.7 p
Chile	..	43.1 b p	45.9	47.0 e	49.1 e	47.6 e	..
Colombia	48.3	29.0	29.1	29.1	24.1 e	21.3 e	..
Czech Republic	18.6	20.4	19.6	21.5	21.8	21.6	20.3 p
Denmark	24.6	32.4	33.2	33.6	34.5	34.6	34.1 p
Estonia	41.4	35.5	39.6	44.5	35.3	33.6	33.6 p
Finland	19.0	25.1	25.4	25.2	25.4	24.6	23.1
France	18.8	20.5	20.6	20.4	20.1	20.3	20.3
Germany	16.8	18.0 b	17.4	17.6	17.4	18.7 e	18.3 p
Greece	47.5	31.9	28.3	28.4	30.6	31.8	30.2 p
Hungary	25.1 d	11.1 d	13.3 d	12.7 b d	14.2 d	13.0 d	13.8 d
Iceland	22.0	30.8 e	31.5	31.5 e	28.1	28.7 e	25.5
Ireland	27.1	23.6 e	21.9 e	23.0 e p	21.7 e p	22.6 e p	16.5 b p
Israel	14.9 d	11.0 d	9.7 d	9.5 d	8.5 d	7.7 d	7.1 d e
Italy	30.2 b	24.2 b e	23.6 e	22.8 e	22.5 e	23.1 e	23.3 e
Japan	13.4	12.3	12.0	11.6 b	11.7	11.7	11.9
Korea	9.9 d	9.1	8.5	8.2	8.3	9.0	9.1
Latvia	40.6	43.8	46.7	52.4	54.8	50.2	47.5 p
Lithuania	54.6	38.9	35.3	35.9	36.4	37.2	35.2
Luxembourg	1.5	19.1	20.4	20.7	21.9	23.3 e p	25.2 e p
Mexico	28.7	50.4	50.2 e	51.2 e	50.8 e	50.9 e	..
Netherlands	34.7	28.3	28.0	27.7	27.6	27.8	26.9 p
New Zealand	32.5	..	24.5	..	23.8 p	..	..
Norway	30.8	32.6	33.7	34.6	34.3	33.2	33.0 p
Poland	31.6	31.4	32.9	31.7	35.6	34.9	34.7 p
Portugal	35.4	44.7	42.5	41.6	40.5	36.0	33.8 p
Slovak Republic	20.4	27.7	24.7	24.3	25.2	26.2	25.4
Slovenia	16.7	10.8	11.2	11.9	11.8	12.2	12.3 p
Spain	29.0	27.5	27.1	26.4	26.6	26.6	26.6 p
Sweden	22.0 b	26.8 e	24.9 v	25.3 e	23.7 b v	23.1	23.5
Switzerland	..	..	29.5	..	28.9	..	..
Türkiye	54.6	36.3	33.5	30.3	29.2	28.4	23.7
United Kingdom	25.7	16.7 e p	16.8 e p	23.9 b e p	23.5 p	22.5 p	..
United States	13.9 d	12.7 b d	12.6 d	12.1 d	11.5 d	11.1 d	10.4 d p
EU27 (from 01/02/2020)	22.2 e	22.2 e	21.8 e	21.7 e	21.6 e	22.2 e	21.8 e
<b>OECD-Total</b>	<b>17.9 e</b>	<b>17.6 e</b>	<b>17.2 e</b>	<b>16.8 e</b>	<b>16.5 e</b>	<b>16.2 e</b>	<b>15.5 e</b>
Argentina	25.8	25.8	25.2	26.4	24.9	23.7	..
China	9.9	6.8	7.2	7.4	..	..	..
Romania	13.7	11.3	10.6	9.8	10.2	8.8	9.2 p
Russian Federation	5.8	9.1	9.0	9.7	10.6	9.8	..
Singapore	24.2	30.8	29.6	28.8	27.5	24.2	..
South Africa	19.3	32.7	33.6	35.8	41.1	..	..
Chinese Taipei	11.4	9.4	9.0	8.9	8.4	7.8	6.9

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 19. Percentage of Gross domestic expenditure on R&D (GERD) performed by the government sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	10.1 e	..	9.5 e	..	..
Austria	5.2 e	7.1 b e	7.1	7.1 e	7.3	7.5 e	7.5 e p
Belgium	8.4	9.6	9.4	9.2	8.8	8.3 e	8.6 p
Canada	9.7	6.6	7.0	7.0	6.7	7.6	6.9 p
Chile	..	12.9 b	13.1	12.6 e	11.3 e	11.1 e	..
Colombia	5.7	8.1	9.6	7.6	7.8 e	6.2 e	..
Czech Republic	22.8 b	18.2	17.2	16.4	16.3	17.1	16.7 p
Denmark	6.5	2.2	3.1	2.9	3.0	3.4	3.4 p
Estonia	11.3	11.4	11.8	11.4	10.2	9.8	9.3 p
Finland	9.6	8.2	8.5	8.3	8.1	7.6	7.3
France	17.8	12.7	12.4	12.4	12.3	11.7	12.2
Germany	14.1 d	13.8 d	13.5 d	13.5 d	13.7 d	14.6 d e	15.1 d p
Greece	20.3	25.0	22.1	22.4	22.4	21.5	22.0 p
Hungary	28.0 d	13.4 d	12.6 d	10.9 b d	10.0 d	9.9 d	10.2 d
Iceland	23.5	4.7 e	4.2	4.2 e	3.2	3.4 e	2.8
Ireland	7.4	4.2 e	3.8 e	4.2 e p	3.8 e p	3.6 e p	3.8 b p
Israel	2.7 d	1.6 d	1.6 d	1.5 d	1.3 d	1.2 d	1.1 d e
Italy	17.3	12.6 b	12.4	12.5	12.6	13.2	13.5
Japan	8.3	7.5	7.8	7.8 b	7.8	8.3	8.4
Korea	11.9 d	11.5	10.7	10.1	10.0	10.1	9.8
Latvia	18.7	31.8	26.1	22.8	18.9	18.8	19.7 p
Lithuania	25.0	26.1	27.9	22.2	20.4	15.8	15.8
Luxembourg	12.1 d	25.5 d	23.9 d	26.0 d	23.8 d	25.4 e p	28.4 e p
Mexico	23.2	26.4	26.2 e	26.6 e	26.2 e	26.3 e	..
Netherlands	12.4 d	6.1 d	5.6 d	5.9 d	5.7 d	5.6 d	5.6 d p
New Zealand	25.9	..	21.1	..	16.7 p	..	..
Norway	15.7	14.2	13.7	13.9	12.7	12.4	13.2 p
Poland	36.4	2.5 b	2.3	1.9	1.3	2.0	2.0 p
Portugal	14.6	5.3	5.5	5.3	5.1	4.9	4.6 p
Slovak Republic	29.7 d	21.4	20.8	21.2	20.0	19.7	18.5
Slovenia	24.2	13.4	13.8	13.5	13.8	13.8	13.4 p
Spain	17.0	18.5	17.7	16.8	17.0	17.5	16.9 p
Sweden	4.9 b	3.4 e	3.6 v	3.6 e	4.5 b v	4.4	4.5
Switzerland	..	..	0.9 d	..	0.9	..	..
Türkiye	11.6	9.5 d	9.6 d	9.2 d	6.6 d	6.8 d	5.6 d
United Kingdom	10.6	4.7 e p	4.6 e p	4.5 b e p	4.5 p	5.0 p	..
United States	12.4 d	9.8 b d	9.6 d	9.7 d	9.6 d	9.1 d	8.3 d p
EU27 (from 01/02/2020)	14.7 e	11.8 e	11.6 e	11.4 e	11.4 e	11.6 e	11.8 e
<b>OECD-Total</b>	<b>11.8 e</b>	<b>9.7 e</b>	<b>9.5 e</b>	<b>9.5 e</b>	<b>9.4 e</b>	<b>9.3 e</b>	<b>8.9 e</b>
Argentina	39.7	49.5	46.8	41.1	37.8	37.3	..
China	21.8	15.7	15.2	15.2	..	..	..
Romania	34.2	33.3	32.4	30.6	31.8	31.9	30.0 p
Russian Federation	26.1	32.0	30.4	34.4	28.3	32.8	..
Singapore	9.7	11.2	11.2	11.6	11.5	12.3	..
South Africa	20.8	23.1	22.3	20.8	23.5	..	..
Chinese Taipei	21.0	12.8	11.7	10.7	10.6	9.6	8.8

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 20. Percentage of Gross domestic expenditure on R&D (GERD) performed by the private non-profit sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	3.21 e	..	3.74 e	..	..
Austria	0.30 e	0.49 e	0.55	0.55 e	0.54	0.56 e	0.56 e p
Belgium	1.31	0.61	0.56	0.72	0.75	0.89 e	0.68 p
Canada	0.53	0.45	0.48	0.44	0.45	0.40	0.37 p
Chile	..	6.36 b	6.83	6.86 e	6.00 e	5.79 e	..
Colombia	27.25	23.05	26.23	21.11	20.58 e	20.85 e	..
Czech Republic	0.51	0.25	0.28	0.22	0.28	0.29	0.26 p
Denmark	0.67	0.35	0.31	0.35	0.41	0.36	0.36 p
Estonia	2.20	1.54	1.41	1.68	1.16	1.64	1.22 p
Finland	0.58	0.86	0.82	0.81	0.89	0.82	0.78
France	1.29	1.64	1.58	1.58	1.65	1.96	1.92
Germany	..	..	..	..	..	..	..
Greece	1.26	0.89	0.80	1.06	0.84	0.58	0.58 p
Hungary	..	..	..	..	..	..	..
Iceland	2.99	..	..	..	..	..	..
Ireland	..	..	..	..	..	..	..
Israel	0.97 d	0.96 d	0.96 d	0.94 d	0.82 d	0.74 d	0.77 d e
Italy	2.12	2.48 b	1.71	1.58	1.78	1.90	1.80
Japan	1.86	1.38	1.38	1.27 b	1.34	1.37	1.21
Korea	1.36 d	1.59	1.41	1.41	1.43	1.84	1.98
Latvia	0.00	..	..	..	..	..	..
Lithuania	..	..	..	..	..	..	..
Luxembourg	..	..	..	..	..	..	..
Mexico	1.13	0.99	1.10 e	1.12 e	1.23 e	1.30 e	..
Netherlands	..	..	..	..	..	..	..
New Zealand	..	..	..	..	..	..	..
Norway	..	..	..	..	..	..	..
Poland	0.31	0.44	0.35	0.30	0.30	0.25	0.21 p
Portugal	11.52	1.60	1.56	1.62	1.91	2.08	2.34 p
Slovak Republic	0.08	0.49	0.41	0.42	0.03	0.03	0.05
Slovenia	0.22	0.02	0.22	0.33	0.61	0.70	0.87 p
Spain	0.14	0.24	0.21	0.26	0.27	0.29	0.33 p
Sweden	0.31 b	0.19 e	0.12 v	0.11 e	0.12 e v	0.12 e	0.12 e
Switzerland	..	..	2.50	..	2.67	..	..
Türkiye	..	..	..	..	..	..	..
United Kingdom	2.32	1.56 e p	1.56 e p	1.34 b e p	1.38 p	1.34 p	..
United States	4.35 d e	4.28 b d e	4.21 d e	4.06 d e	3.91 d e	3.85 d	3.68 d e p
EU27 (from 01/02/2020)	0.89 e	0.82 e	0.72 e	0.71 e	0.75 e	0.82 e	0.79 e
<b>OECD-Total</b>	<b>2.59 e</b>	<b>2.44 e</b>	<b>2.37 e</b>	<b>2.31 e</b>	<b>2.30 e</b>	<b>2.35 e</b>	<b>2.30 e</b>
Argentina	2.23	0.77 b	0.90	1.14	1.13	1.13	..
China	..	..	..	..	..	..	..
Romania	2.44	0.23	0.29	0.22	0.21	0.31	0.34 p
Russian Federation	0.18	0.21	0.41	0.30	0.43	0.73	..
Singapore	..	..	..	..	..	..	..
South Africa	1.60	2.85	3.14	4.04	4.38	..	..
Chinese Taipei	0.48	0.30	0.24	0.13	0.13	0.13	0.10

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 21. Total researchers in headcount**
*Headcount*

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	..	..	83 648 d	..	93 179 d	..	..
Belgium	48 757	..	78 867	..	91 757	..	..
Canada	..	..	..	..	..	..	..
Chile	..	14 181 d	14 392 d	15 467 d e	15 438 d e	15 751 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	37 542	56 178	59 789	61 966	63 690	65 193	..
Denmark	43 460	60 782	60 085	60 389	61 573 p	61 481 p	..
Estonia	5 734	6 845	7 344	7 281	7 734	8 659	..
Finland	50 773	53 752	54 139	55 415	58 291	61 292	..
France	251 599	396 594	416 217 p	429 959 p	..	..	..
Germany	406 253	..	623 125	..	667 394	..	..
Greece	33 396 d	..	61 616 d	..	66 451 d	72 234 d	..
Hungary	31 407	38 915	42 729	54 970 d	58 091 d	62 177 d	..
Iceland	3 821	..	3 783	..	..	..	4 703
Ireland	17 653	..	34 721 e	..	37 003	..	..
Israel	..	..	..	..	..	..	..
Italy	125 534 d	185 916 b d	195 560 d	210 419 d	222 165 d	217 052 d	..
Japan	861 901 d	917 725 d	930 720 d	935 658 d	942 180 d	951 726 d	983 604 d
Korea	234 702 d	460 769	482 796	514 170	538 136	558 045	586 666
Latvia	5 748 d	7 400 d	7 504 d	7 439 d	7 724 d	8 394 d	..
Lithuania	11 918.00	17 746.00	18 767.00	19 198.00	18 811.00	19 431.00	..
Luxembourg	2 443	..	3 540	..	3 722	..	..
Mexico	..	54 357	54 578 e	54 539 e	58 013 e	62 356 e	..
Netherlands	57 782	124 568	124 834	130 153	136 034	139 928	..
New Zealand	22 186	..	40 000	..	44 000	..	..
Norway	36 555	54 601	57 934	59 629	61 657	63 103	..
Poland	97 875	132 547	187 905 d	192 833 d	194 607 d	196 420 d	..
Portugal	37 769	85 780	89 659	96 123	100 823	104 681	..
Slovak Republic	17 526 d	26 720 d	26 861 d	28 755 d	28 851 d	28 696 d	..
Slovenia	7 644	11 282	14 079 d	15 388 d	15 925 d	16 328 d	..
Spain	181 023	218 680 d	225 995 d	234 798 d	241 372 d	244 187 d	..
Sweden	82 459 d	..	107 042 b	..	111 179	..	..
Switzerland	..	..	71 657	..	77 492	..	..
Türkiye	83 856	191 769	210 769	230 030	243 773	257 930	288 986
United Kingdom	364 807 e	510 980 e	520 936 e	..	..	..	..
United States	..	..	..	..	..	1 797 567 e	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	49 050	86 562	84 284	88 872	90 656	90 397	..
China	..	..	..	..	..	..	..
Romania	29 608	27 801	27 367	27 471	27 168	28 090	..
Russian Federation	391 121 e	370 379 e	359 793 e	347 854 e	348 221	346 497	..
Singapore	27 969	43 177	42 838	43 329	46 330	46 061	..
South Africa	39 266	56 761	61 840	62 166	62 002	..	..
Chinese Taipei	115 954	184 898	187 971	193 035	199 144	203 970	208 660

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 22. Women researchers as a percentage of total researchers**  
Based on headcount

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	..	..	30.1 d	..	30.4 d	..	..
Belgium	29.6	..	34.8	..	32.6	..	..
Canada	..	..	..	..	..	..	..
Chile	..	33.1 d	34.4 d	32.4 d e	34.8 d e	34.9 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	28.8	26.7	26.8	26.6	27.2	27.6	..
Denmark	29.7	..	35.7	..	35.3 p	..	..
Estonia	40.8	43.6	42.2	43.9	42.4	42.5	..
Finland	30.2	32.5	33.2	33.7	33.7	33.4	..
France	28.0	28.0	28.3 p	..	..	..	..
Germany	21.3	..	27.9	..	28.1	..	..
Greece	36.4 d	..	37.8 d	..	39.0 d	38.8 d	..
Hungary	34.2	30.8	30.5	28.0 d	30.0 d	28.5 d	..
Iceland	39.3	..	46.4	..	..	..	45.2
Ireland	30.3	..	36.3 e	..	38.1 e	..	..
Israel	..	..	..	..	..	..	..
Italy	32.3 d	35.2 b d	34.3 d	33.8 d	34.2 d	34.9 d	..
Japan	11.9 d	15.7 d	16.2 d	16.6 d	16.9 d	17.5 d	17.8 d
Korea	12.9 d	19.7	20.1	20.4	21.0	21.4	22.2
Latvia	51.5 d	52.2 d	52.2 d	50.7 d	50.6 d	50.0 d	..
Lithuania	48.65	51.57	49.51	49.00	49.08	49.07	..
Luxembourg	18.2	..	28.1	..	27.4	..	..
Mexico	..	33.7	33.5 e	33.2 e	32.8 e	32.3 e	..
Netherlands	21.0	26.1	26.1	27.0	27.9	28.6	..
New Zealand	..	..	..	..	..	..	..
Norway	31.6	37.6	38.1	38.8	38.6	38.7	..
Poland	39.3	36.4	38.1 d	37.9 d	37.6 d	36.6 d	..
Portugal	44.4	43.5	43.7	43.3	42.8	42.5	..
Slovak Republic	41.5 d	41.4 d	41.9 d	41.2 d	41.0 d	41.1 d	..
Slovenia	34.8	34.5	32.3 d	32.5 d	33.3 d	33.6 d	..
Spain	36.7	40.2 d	40.5 d	40.8 d	41.3 d	41.5 d	..
Sweden	35.7 d	..	32.6 b	..	33.3	..	..
Switzerland	..	..	35.2	..	35.8	..	..
Türkiye	36.1	36.7	37.0	36.8	37.0	36.7	37.1
United Kingdom	35.7 e	38.7 e	38.7 e	..	..	..	..
United States	..	..	..	..	..	..	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	50.5	53.0	53.8	53.3	53.1	53.5	..
China	..	..	..	..	..	..	..
Romania	45.3	45.8	46.7	46.2	46.9	47.3	..
Russian Federation	42.4 e	40.0 e	39.5 e	39.2 e	39.1	38.8	..
Singapore	26.3	30.7	30.7	30.8	30.6	..	..
South Africa	39.7	45.1	44.9	45.7	46.2	..	..
Chinese Taipei	19.6	22.3	22.6	22.6	22.7	22.9	23.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 23. Business enterprise expenditure on R&D (BERD) at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	7 515.5	..	11 801.7	..	12 278.7	..	..
Austria	4 770.9 e	10 071.0 b e	10 178.5	10 874.3 e	11 678.9	11 366.1 e	11 906.1 e
Belgium	4 233.8	9 532.2	10 744.3	12 307.6	14 925.5	15 604.4 e	16 519.5 p
Canada	12 886.0 d	15 511.4	15 699.0	17 286.0	17 753.0	18 404.3	18 951.1 p
Chile	..	594.1	550.2	591.3 e	560.0 e	573.5 e	..
Colombia	109.6	716.7	635.0	982.7	1 219.3 e	1 151.9 e	..
Czech Republic	1 523.5 b	3 894.6	4 572.2	5 145.2	5 605.8	5 545.7	6 006.1 p
Denmark	3 023.3	5 991.4	5 931.2	6 235.1	6 266.2	6 485.9	6 640.2 p
Estonia	93.2	263.7	268.5	287.4	450.2	504.6	566.0 p
Finland	3 958.3	4 429.2	4 664.2	4 951.0	5 257.4	5 642.4	6 231.4
France	24 554.5	41 440.8	42 875.9	44 994.1	49 170.6	49 463.4	50 472.7
Germany	44 288.0	83 477.7	92 358.9	98 037.3	104 126.5	97 965.4 e	102 095.3 p
Greece	504.0	1 257.9	1 728.6	1 858.0	1 963.8	2 113.3	2 281.9 p
Hungary	685.1 d	2 398.7 d	2 779.9 d	3 555.5 b d	3 744.2 d	4 057.4 d	4 423.6 d
Iceland	152.9	243.9 d e	256.1 d	259.7 d e	345.8 d	336.8 d e	435.7 d
Ireland	1 314.6	2 886.6 e	3 487.2	3 506.3 e	4 041.2	4 259.4 e	4 513.8 p
Israel	5 677.4 d	12 629.5 d	13 953.2 d	15 015.5 d	17 280.4 d	19 114.3 d	20 865.3 d e
Italy	9 186.6	20 110.4 b	21 510.6	23 390.5	25 258.6	23 877.5	25 132.9
Japan	98 384.0	126 216.4	131 290.7	136 634.0	136 339.7	135 012.0	139 020.8
Korea	23 531.2 d	62 822.4	71 695.7	80 520.2	83 494.2	87 868.8	94 639.1
Latvia	66.9	55.7	77.4	94.5	105.4	133.4	149.6 p
Lithuania	73.54	261.29	315.02	399.26	479.71	598.01	666.60
Luxembourg	431.1	463.7	473.9	441.9	476.3	412.0	399.2 p
Mexico	2 510.0	2 053.8	1 818.8 e	1 645.3 e	1 566.4 e	1 490.6 e	..
Netherlands	5 761.6	12 581.6	13 638.0	14 159.1	15 215.2	16 129.0	16 921.6 p
New Zealand	495.1	..	1 491.3	1 637.3	1 912.2	2 011.0	..
Norway	1 752.6	3 360.3	3 732.6	3 912.1	4 232.3	4 271.5	4 620.8 p
Poland	947.8	6 799.5 b	7 614.9	9 694.9	11 042.5	11 655.4	13 036.2 p
Portugal	695.5	2 023.9	2 264.2	2 493.9	2 810.8	3 309.0	3 718.4 p
Slovak Republic	219.8	641.3	784.8	772.0	822.8	872.4	964.6
Slovenia	398.0	1 065.1	1 052.3	1 167.1	1 324.4	1 349.6	1 455.1 p
Spain	7 128.0	11 088.6	12 252.3	13 366.6	14 260.0	14 108.5	15 486.4 p
Sweden	7 564.0 b	11 307.5 e	12 531.6	12 832.5 e	14 082.1	14 673.2	15 078.5
Switzerland	..	..	11 888.1	..	13 433.5	..	..
Türkiye	1 554.8	10 764.3	12 269.6	14 265.1	15 826.4	16 458.7	20 609.5
United Kingdom	18 809.0	51 722.1 p	54 535.4 p	59 607.6 p	62 083.8 p	64 167.0 p	69 284.7 p
United States	226 159.0 d	390 336.0 b	416 601.0	457 861.0	508 420.0	554 742.0	625 486.0 p
EU27 (from 01/02/2020)	122 200.5 e	234 665.7 e	255 018.9 e	273 860.5 e	296 743.1 e	293 857.1 e	308 796.5 e
<b>OECD-Total</b>	<b>537 421.9 e</b>	<b>933 761.8 e</b>	<b>1 000 315.8 e</b>	<b>1 085 446.2 e</b>	<b>1 169 860.7 e</b>	<b>1 223 210.5 e</b>	<b>1 334 578.8 e</b>
Argentina	716.1	1 121.6	1 565.2	1 604.0	1 768.6	1 853.6	..
China	58 904.9	304 448.6	326 502.0	360 203.6	402 101.3	..	..
Romania	420.0	1 270.1	1 517.5	1 699.2	1 762.9	1 763.3	1 982.5 p
Russian Federation	12 317.7	22 903.7	25 408.6	23 291.2	27 713.3	27 141.5	..
Singapore	3 560.1	6 029.3	6 010.5	6 123.2	6 748.4	7 846.3	..
South Africa	2 318.5	2 399.9	2 467.7	2 214.2	1 598.0	..	..
Chinese Taipei	10 252.5	26 622.0	28 869.4	32 393.0	35 684.3	39 570.2	46 684.8

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 24. Business enterprise expenditure on R&D (BERD) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	1.04	..	0.95	..	0.92	..	..
Austria	1.66 e	2.19 b e	2.14	2.16 e	2.20	2.23 e	2.22 e
Belgium	1.22	1.73	1.87	2.05	2.33	2.48 e	2.42 p
Canada	1.10 d	0.92	0.89	0.93	0.95	1.02	0.93 p
Chile	..	0.14	0.12	0.12 e	0.11 e	0.12 e	..
Colombia	0.03	0.11	0.09	0.13	0.15 e	0.15 e	..
Czech Republic	0.68 b	1.02	1.11	1.18	1.19	1.21	1.25 p
Denmark	1.63	2.01	1.86	1.87	1.80	1.83	1.75 p
Estonia	0.41	0.64	0.60	0.60	0.87	0.96	0.98 p
Finland	2.35	1.79	1.78	1.81	1.84	1.95	2.06
France	1.27	1.45	1.44	1.44	1.44	1.52	1.45
Germany	1.69	2.00	2.11	2.14	2.18	2.09 e	2.09 p
Greece	0.18	0.42	0.56	0.58	0.59	0.70	0.69 p
Hungary	0.40 d	0.87 d	0.96 d	1.14 b d	1.11 d	1.22 d	1.24 d
Iceland	1.38	1.36 d e	1.34 d	1.29 d e	1.60 d	1.68 d e	2.01 d
Ireland	0.78	0.85 e	0.93	0.85 e	0.91	0.91 e	0.84 p
Israel	3.20 d	3.87 d	4.06 d	4.20 d	4.66 d	5.16 d	5.06 d e
Italy	0.53	0.83 b	0.85	0.90	0.92	0.93	0.91
Japan	2.39	2.45	2.49	2.56	2.55	2.57	2.59
Korea	1.94 d	3.10	3.41	3.63	3.72	3.79	3.90
Latvia	0.21	0.11	0.14	0.16	0.17	0.21	0.23 p
Lithuania	0.2	0.3	0.3	0.4	0.4	0.5	0.5
Luxembourg	1.35	0.70	0.69	0.62	0.64	0.54	0.47 p
Mexico	0.19	0.09	0.07 e	0.06 e	0.06 e	0.06 e	..
Netherlands	0.94	1.41	1.45	1.42	1.46	1.55	1.52 p
New Zealand	0.47	..	0.73	0.79	0.84	0.87	..
Norway	0.79	1.08	1.10	1.05	1.13	1.22	1.04 p
Poland	0.18	0.64 b	0.67	0.80	0.83	0.87	0.91 p
Portugal	0.29	0.62	0.67	0.69	0.73	0.92	0.98 p
Slovak Republic	0.25	0.40	0.48	0.45	0.45	0.49	0.52
Slovenia	0.83	1.52	1.39	1.44	1.51	1.57	1.57 p
Spain	0.59	0.64	0.66	0.70	0.70	0.78	0.80 p
Sweden	2.45 b	2.26 e	2.40	2.36 e	2.43	2.52	2.41
Switzerland	..	..	2.06	..	2.16	..	..
Türkiye	0.19	0.51	0.54	0.62	0.68	0.71	0.80
United Kingdom	0.95	1.78 p	1.79 p	1.90 p	1.88 p	2.09 p	2.07 p
United States	1.73 d	2.09 b	2.14	2.23	2.38	2.63	2.68 p
EU27 (from 01/02/2020)	1.05 e	1.30 e	1.34 e	1.37 e	1.40 e	1.43 e	1.41 e
<b>OECD-Total</b>	<b>1.45 e</b>	<b>1.67 e</b>	<b>1.71 e</b>	<b>1.78 e</b>	<b>1.84 e</b>	<b>1.97 e</b>	<b>1.99 e</b>
Argentina	0.14	0.13	0.15	0.15	0.17	0.20	..
China	0.89	1.63	1.64	1.66	1.72	..	..
Romania	0.21	0.27	0.29	0.30	0.28	0.28	0.29 p
Russian Federation	0.68	0.65	0.67	0.55	0.63	0.62	..
Singapore	1.42	1.20	1.12	1.08	1.16	1.41	..
South Africa	0.50	0.34	0.34	0.30	0.21	..	..
Chinese Taipei	1.57	2.39	2.53	2.69	2.83	3.00	3.19

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 25. Business enterprise expenditure on R&D (BERD) at 2010 prices and PPP**

Million 2015 USD

	2005	2016	2017	2018	2019	2020	2021
Australia	8 936.8	..	11 200.8	..	11 095.4	..	..
Austria	6 346.6 e	9 617.4 b e	9 599.5	9 945.7 e	10 295.5	9 733.8 e	10 137.4 e
Belgium	5 524.4	9 130.5	10 037.0	11 187.3	12 987.6	13 085.0 e	13 578.8 p
Canada	15 048.1 d	14 838.4	14 876.6	16 053.7	16 565.0	16 820.9	16 764.4 p
Chile	..	577.0	510.3	537.8 e	503.3 e	493.5 e	..
Colombia	124.5	686.3	591.7	871.2	1 046.2 e	949.2 e	..
Czech Republic	1 963.6 b	3 743.0	4 285.4	4 681.4	4 871.1	4 690.1	5 027.8 p
Denmark	4 226.3	5 791.7	5 499.7	5 650.4	5 510.1	5 489.3	5 501.8 p
Estonia	137.4	253.4	252.4	259.5	392.2	431.5	473.9 p
Finland	5 215.1	4 294.5	4 397.8	4 524.0	4 648.2	4 818.7	5 233.1
France	31 597.2	39 764.8	40 407.1	41 226.6	42 138.7	40 903.8	41 677.4
Germany	56 972.2	79 682.6	85 950.8	88 318.7	90 954.4	83 683.6 e	85 953.4 p
Greece	647.0	1 222.7	1 636.9	1 731.1	1 773.9	1 908.8	2 040.7 p
Hungary	951.8 d	2 358.2 d	2 706.7 d	3 376.1 b d	3 435.6 d	3 611.7 d	3 944.2 d
Iceland	185.9	235.2 d e	241.7 d	243.3 d e	309.6 d	303.3 d e	377.9 d
Ireland	1 806.4	2 811.3 e	3 359.8	3 333.1 e	3 772.6	3 991.3 e	4 195.6 p
Israel	6 475.0 d	12 150.2 d	13 297.4 d	14 323.5 d	16 554.4 d	17 971.8 d	19 134.2 d e
Italy	12 372.1	18 857.9 b	19 721.0	20 951.0	21 609.8	19 836.5	20 753.4
Japan	118 417.4	128 178.9	132 903.2	137 071.2	136 019.4	131 417.0	135 172.1
Korea	26 119.6 d	61 694.3	69 985.3	76 630.1	80 278.7	81 356.4	87 147.2
Latvia	91.6	53.8	72.6	86.3	93.2	115.9	128.5 p
Lithuania	100.1	253.0	295.4	364.8	418.7	519.4	560.9
Luxembourg	648.8	453.2	451.6	412.7	434.9	365.6	334.8 p
Mexico	3 350.3	1 972.4	1 727.5 e	1 549.6 e	1 476.0 e	1 400.8 e	..
Netherlands	7 191.0	12 300.0	12 946.7	13 030.8	13 622.4	13 892.7	14 341.0 p
New Zealand	644.5	..	1 374.2	1 529.0	1 668.2	1 733.4	..
Norway	2 171.1	3 331.0	3 512.9	3 503.8	3 704.3	3 708.6	3 775.3 p
Poland	1 246.0	6 669.4 b	7 382.4	9 314.2	10 149.4	10 414.5	11 574.1 p
Portugal	906.6	1 943.7	2 158.1	2 316.6	2 510.0	2 888.6	3 258.9 p
Slovak Republic	276.8	659.9	818.9	804.0	822.6	856.1	948.6
Slovenia	486.1	1 023.6	984.7	1 064.7	1 149.3	1 146.4	1 240.0 p
Spain	9 153.1	10 685.6	11 441.5	12 347.2	12 597.7	12 482.2	13 494.5 p
Sweden	9 677.2 b	11 097.5 e	12 082.4	12 101.4 e	12 721.9	12 936.5	13 004.7
Switzerland	..	..	11 535.2	..	12 542.5	..	..
Türkiye	2 345.3	10 628.0	12 172.5	14 333.2	15 951.6	16 771.2	21 133.0
United Kingdom	23 366.6	50 479.0 p	51 984.2 p	56 102.5 p	56 537.6 p	55 662.3 p	59 364.6 p
United States	270 579.2 d	386 462.9 b	404 777.9	434 423.2	473 892.7	510 408.7	550 754.7 p
EU27 (from 01/02/2020)	158 698.2 e	225 150.0 e	239 156.1 e	249 960.0 e	259 968.9 e	250 842.2 e	260 729.0 e
<b>OECD-Total</b>	<b>656 916.1 e</b>	<b>917 730.3 e</b>	<b>967 173.6 e</b>	<b>1 027 261.3 e</b>	<b>1 085 061.1 e</b>	<b>1 111 471.9 e</b>	<b>1 181 791.9 e</b>
Argentina	860.8	1 075.8	1 314.8	1 316.0	1 425.5	1 476.2	..
China	63 551.4	309 386.7	333 883.8	359 752.9	395 135.4	..	..
Romania	663.8	1 190.6	1 373.1	1 494.6	1 447.7	1 394.2	1 532.8 p
Russian Federation	18 375.5	22 865.4	24 010.2	20 356.1	23 779.1	22 822.0 e	..
Singapore	3 947.7	5 981.7	5 839.6	5 819.2	6 317.5	7 253.9	..
South Africa	2 691.7	2 366.9	2 412.4	2 114.9	1 506.4	..	..
Chinese Taipei	12 095.8	26 935.6	29 372.6	32 188.5	34 837.4	38 169.6	43 236.4

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 26. Business enterprise expenditure on R&D (BERD) as a percentage of value added in industry**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	1.55	..	1.43	..	1.39 e	..	..
Austria	2.52 e	3.38 b e	3.29	3.32 e	3.39 e	3.49 e	3.47 e
Belgium	1.92	2.80	3.03	3.32	3.76	4.05 e	3.93 e p
Canada	1.65 d	1.49	1.42	1.48	1.51	1.63 e	1.49 e p
Chile	..	0.21	0.18	0.18 e	0.17 e	0.18 e	..
Colombia	0.05	0.16	0.14	0.20	0.23 e	0.23 e	..
Czech Republic	0.97 b	1.48	1.61	1.73	1.75	1.81 e	1.87 e p
Denmark	2.83	3.43	3.17	3.17	3.04 e	3.13 e	2.94 e p
Estonia	0.61	1.02	0.95	0.93	1.37 e	1.51 e	1.53 e p
Finland	3.84	3.16	3.07	3.13	3.17 e	3.41 e	3.58 e
France	2.15	2.51	2.50	2.50	2.49	2.69 e	2.54 e
Germany	2.62	3.14	3.30	3.36	3.46	3.35 e	3.33 e p
Greece	0.29	0.79	1.03	1.07	1.07	1.27 e	1.23 e p
Hungary	0.63 d	1.40 d	1.54 d	1.83 b d	1.79 d e	2.00 d e	2.02 d e
Iceland	2.29	2.19 d e	2.21 d	2.11 d e	2.62 d	2.92 d e	3.42 d e
Ireland	1.14	1.11 e	1.20	1.09 e	1.17	1.16 e	1.07 e p
Israel	5.45 d e	6.58 d	6.95 d e	7.17 d e	7.96 d e	8.80 d e	8.63 d e
Italy	0.83	1.35 b	1.38	1.45	1.49	1.53 e	1.49 e
Japan	3.19	3.42	3.47	3.57	3.58	3.62 e	3.64 e
Korea	2.74 d e	4.46	4.91	5.26	5.44 e	5.62 e	5.78 e
Latvia	0.32	0.17	0.23	0.26	0.27 e	0.35 e	0.37 e p
Lithuania	0.2	0.4	0.5	0.6	0.6 e	0.8 e	0.8 e
Luxembourg	2.04	1.04	1.02	0.91	0.94 e	0.79 e	0.69 e p
Mexico	0.25	0.12	0.10 e	0.09 e	0.08 e	0.09 e	..
Netherlands	1.44	2.19	2.24	2.22	2.28 e	2.47 e	2.44 e p
New Zealand	0.69	..	1.14	1.22	1.31 e	1.36 e	..
Norway	1.19	1.81	1.81	1.72	1.89 e	2.11 e	1.66 e p
Poland	0.26	0.90 b	0.94	1.13	1.19 e	1.26 e	1.33 e p
Portugal	0.49	1.06	1.14	1.19	1.25 e	1.63 e	1.74 e p
Slovak Republic	0.36	0.59	0.71	0.68	0.68	0.76 e	0.82 e
Slovenia	1.26	2.33	2.11	2.17	2.26 e	2.39 e	2.40 e p
Spain	0.88	1.02	1.06	1.12	1.11 e	1.30 e	1.31 e p
Sweden	3.92 b	3.63 e	3.85	3.80 e	3.90	4.09 e	3.85 e
Switzerland	..	..	3.00	..	3.14 e	..	..
Türkiye	0.28	0.74	0.77	0.87	0.96	1.00 e	1.08 e
United Kingdom	1.54	2.91 p	2.91 p	3.08 p	3.06 p	3.45 e p	3.42 e p
United States	2.69 d	3.31 b	3.38	3.51	3.74	4.21 e	4.18 e p
EU27 (from 01/02/2020)	1.64 e	2.07 e	2.12 e	2.18 e	2.22 e	2.31 e	2.26 e
<b>OECD-Total</b>	<b>2.19 e</b>	<b>2.58 e</b>	<b>2.64 e</b>	<b>2.74 e</b>	<b>2.85 e</b>	<b>3.09 e</b>	<b>3.07 e</b>
Argentina	0.20	0.20 e	0.24 e	0.25 e	0.27 e	0.32 e	..
China	1.03 e	1.97 e	2.00 e	2.03 e	2.10 e	..	..
Romania	0.29	0.39	0.41	0.43	0.40	0.40	0.42 p
Russian Federation	1.01 e	0.96	0.98	0.81	0.93	0.94	..
Singapore	1.69 e	1.49 e	1.39 e	1.31 e	1.41 e	1.68 e	..
South Africa	0.69 e	0.50 e	0.50 e	0.44 e	0.31 e	..	..
Chinese Taipei	2.11 e	3.15	3.29	3.52	3.73	3.92	4.09

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 27. Business enterprise researchers in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	23 794	..	34 576	..	35 048	..	..
Austria	18 155 d e	29 615 d e	29 948 d	31 598 d e	33 868 d	32 849 d e	34 849 d e
Belgium	16 769	29 532 e	29 358	31 288	33 885	36 316 e	49 045 d p
Canada	84 410	91 750	93 560	105 610	110 490	..	..
Chile	..	2 651 d	2 627 d	2 739 d e	2 680 d e	2 647 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	9 716 b	19 185	20 206	21 150	21 707	22 527	25 611 p
Denmark	17 624	26 976	26 095	25 666	26 132 p	25 912 p	25 288 p
Estonia	883	1 318	1 585	1 652	1 950	2 108	2 319 p
Finland	21 967	20 257	20 544	21 328	22 865	24 649	27 018
France	106 837	170 571	180 642	189 012	195 503	202 218 e p	209 993
Germany	166 874	235 758 e	252 759	261 634 e	276 964	272 171	276 310 p
Greece	6 033 d	5 608 d	9 660 d	10 041 d	10 286 d	11 672 d	13 188 d p
Hungary	5 008	15 247	17 527	21 467 d	22 801 d	24 648 d	26 261
Iceland	1 012	..	876	..	..	..	1 359
Ireland	6 768	11 185 e	12 569	12 192 e	12 938	13 324 e	..
Israel	..	..	..	..	..	..	..
Italy	27 939 d	56 197 b d	62 478 d	73 335 d	78 111 d	73 694 d	84 263
Japan	481 496 d	488 828 d	498 732 d	504 746 d	507 473 d	515 469 d	529 053 d
Korea	137 706 d	287 869	311 566	334 810	354 381	365 559	390 409
Latvia	468 d	582 d	647 d	684 d	758 d	846 d	1 155 p
Lithuania	716.0	1 956.0	2 554.0	2 832.0	3 147.0	2 930.0	3 399.0
Luxembourg	1 696	1 194	1 275	1 134	1 282	1 105	1 012 p
Mexico	19 888	14 500	15 268 e	15 971 e	18 242 e	21 239 e	..
Netherlands	22 898	59 700	62 672	66 601	67 824	70 569	74 408 p
New Zealand	3 700	..	8 000	9 000	10 000	11 000	..
Norway	10 239 d	15 330 d	16 342 d	16 679 d	17 540 d	18 525 d	19 708 p
Poland	9 412	40 838 b	53 947 d	56 727 d	57 913 d	63 339 d	72 092 p
Portugal	4 014	13 426	15 407	16 746	19 220	21 979	24 617 p
Slovak Republic	1 947 d	2 846 d	3 333 d	3 918 d	4 216 d	4 243 d	4 759
Slovenia	1 936	4 489	5 757 d	6 270 d	6 383 d	6 664 d	6 628 p
Spain	35 034	47 222 d	49 571 d	54 360 d	54 888 d	55 299 d	60 374 p
Sweden	36 697 b d	47 127 e	51 843	54 720 e	55 498	57 538	63 200
Switzerland	..	..	21 094	..	23 030	..	..
Türkiye	9 456	52 463	62 305	75 308	83 706	97 205	112 962
United Kingdom	93 717	112 087	113 864	..	..	..	..
United States	..	973 000	1 023 000	1 127 000	1 147 000	1 201 000	..
EU27 (from 01/02/2020)	531 938 e	854 348 e	923 884 e	979 744 e	1 024 423 e	1 043 116 e	1 117 781 e
<b>OECD-Total</b>	<b>2 252 493 e</b>	<b>3 072 423 e</b>	<b>3 248 592 e</b>	<b>3 492 182 e</b>	<b>3 621 628 e</b>	<b>3 739 840 e</b>	<b>..</b>
Argentina	3 763	4 614	5 155	6 309	5 988	5 922	..
China	696 413 d	1 048 147	1 055 746	1 143 157	1 216 670	..	..
Romania	10 319	4 857	4 467	4 643	4 606	4 989	6 335 p
Russian Federation	237 959	198 561	193 425	179 312	192 210	184 864	..
Singapore	14 238	19 333	19 311	20 190	22 261	23 058	..
South Africa	5 896	4 777	5 482	4 535	3 228	..	..
Chinese Taipei	51 202	102 721	105 558	109 276	113 300	118 174	122 949

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 28. Business enterprise researchers as a percentage of national total**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	63.8 d e	63.0 d e	63.0 d	63.0 d e	64.2 d	63.3 d e	63.3 d e
Belgium	50.6	54.4 e	54.4	54.5	55.9	56.7 e	64.3 d p
Canada	61.7	57.7	57.7	60.3	60.5	..	..
Chile	..	29.5 d	28.9 d	27.9 d e	27.7 d e	26.6 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	40.2 b	51.4	51.6	51.3	51.1	51.0	53.3 p
Denmark	62.5	60.2	59.4	58.4	58.5 p	58.2 p	56.2 p
Estonia	26.5	30.4	33.9	33.3	39.0	41.3	43.2 p
Finland	55.5	56.4	55.5	56.3	57.2	59.1	62.0
France	52.8	59.7	61.0	61.9	62.4	62.9 e p	61.8
Germany	61.3	59.0 e	60.2	60.3 e	61.5	60.4	60.1 p
Greece	30.8 d	19.1 d	27.6 d	27.4 d	26.3 d	27.2 d	29.8 d p
Hungary	31.5	59.1	61.7	57.1 d	58.0 d	58.5 d	60.6
Iceland	46.9	..	42.7	..	..	..	53.1
Ireland	58.4	46.0 e	51.4 e	53.5 e	55.0	55.7 e	..
Israel	..	..	..	..	..	..	..
Italy	33.9 d	42.0 b d	44.5 d	48.1 d	48.6 d	46.9 d	48.8
Japan	70.7 d	73.4 d	73.7 d	74.4 b d	74.4 d	74.7 d	75.1 d
Korea	76.6 d	79.7	81.3	82.0	82.3	81.8	82.9
Latvia	14.3 d	18.5 d	18.6 d	19.8 d	20.9 d	20.8 d	25.5 p
Lithuania	9.4	22.9	29.2	31.7	32.7	28.8	30.9
Luxembourg	76.1	43.1	43.4	39.6	41.0	37.6 e p	31.6 p
Mexico	45.3	37.3	39.0 e	40.8 e	43.7 e	47.2 e	..
Netherlands	47.8	68.1	68.9	69.8	69.4	69.1	70.2 p
New Zealand	28.5	..	33.3	..	35.7	..	..
Norway	48.3 d	48.0 d	48.6 d	48.6 d	48.9 d	51.0 d	51.0 p
Poland	15.1	46.3 b	47.1 d	48.2 d	47.9 d	50.8 d	53.1 p
Portugal	19.0	32.5	34.3	35.1	38.3	41.3	43.8 p
Slovak Republic	17.8 d	20.1 d	21.9 d	24.0 d	24.8 d	24.6 d	27.2
Slovenia	36.9	55.3	61.9 d	62.3 d	60.7 d	61.4 d	59.9 p
Spain	31.9	37.3 d	37.2 d	38.8 d	38.1 d	38.0 d	39.2 p
Sweden	66.7 b d e	67.0 e	70.9	72.8 e	70.6	71.8	74.6
Switzerland	..	..	47.6	..	48.3	..	..
Türkiye	24.2	52.4	55.7	59.6	61.8	64.9	66.9
United Kingdom	37.7 b e	38.5 e	38.5	..	..	..	..
United States	..	78.0 e	78.7 e	79.9 e	79.9 e	80.4 e	..
EU27 (from 01/02/2020)	47.2 e	52.9 e	54.0 e	54.9 e	55.3 e	55.3 e	56.1 e
<b>OECD-Total</b>	<b>59.3 e</b>	<b>62.7 e</b>	<b>63.5 e</b>	<b>64.8 e</b>	<b>65.3 e</b>	<b>65.9 e</b>	<b>..</b>
Argentina	11.8	8.4	9.7	11.6	10.9	10.6	..
China	62.3 d	61.9	60.7	61.3	..	..	..
Romania	44.9	26.9	25.5	27.0	26.5	27.2	33.1 p
Russian Federation	51.2	46.3	47.1	44.2	48.0	46.5	..
Singapore	59.8	49.3	49.6	51.4	52.4	54.2	..
South Africa	34.1	17.3	18.6	15.6	11.4	..	..
Chinese Taipei	57.6	69.8	70.4	71.0	71.2	72.3	73.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 29. Business enterprise researchers in full-time equivalent per thousand employment in industry***Per thousand*

	2005	2016	2017	2018	2019	2020	2021
Australia	3.2	..	3.9	..	3.8 e	..	..
Austria	6.2 d e	9.1 d e	9.1 d	9.4 d e	9.9 d e	9.9 d e	10.3 d e
Belgium	5.7	9.3 e	9.1	9.6	10.2	11.0 e	14.5 d e p
Canada	6.9	6.9	6.9	7.7	7.9	..	..
Chile	..	0.4 d	0.4 d	0.4 d e	0.4 d e	0.5 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	2.5 b	4.6	4.7	4.9	5.0	5.3 e	6.1 e p
Denmark	9.5	14.1	13.3	12.9	12.9 e p	13.0 e p	12.4 e p
Estonia	1.9	2.8	3.2	3.3	3.9 e	4.3 e	4.8 e p
Finland	12.8	11.5	11.5	11.7	12.3 e	13.7 e	14.7 e
France	5.9	9.1	9.5	9.8	10.0	10.5 e p	10.5 e
Germany	5.8	7.5 e	7.9	8.1 e	8.5	8.5 e	8.7 e p
Greece	1.7 d	1.6 d	2.8 d	2.9 d	2.9 d	3.4 d e	3.8 d e p
Hungary	1.6	4.5	5.1	6.0 d	6.3 d e	6.9 d e	7.2 e
Iceland	8.6	..	6.2	..	..	..	10.2 e
Ireland	4.4	7.2 e	7.9	7.5 e	7.7	8.3 e	..
Israel	..	..	..	..	..	..	..
Italy	1.5 d	3.1 b d	3.4 d	3.9 d	4.1 d	4.0 d e	4.5 e
Japan	8.8 d	9.3 d	9.3 d	9.3 d	9.3 d	9.5 d e	9.7 d e
Korea	7.2 d	13.6	14.7	15.8	16.6 e	17.4 e	18.5 e
Latvia	0.6 d	0.9 d	1.0 d	1.0 d	1.1 d e	1.3 d e	1.8 e p
Lithuania	0.7	1.9	2.5	2.7	3.0 e	2.8 e	3.3 e
Luxembourg	6.9	3.7	3.8	3.3	3.6 e	3.1 e	2.7 e p
Mexico	0.8	0.5	0.5 e	0.5 e	0.6 e	0.8 e	..
Netherlands	3.8	9.2	9.4	9.7	9.7 e	10.3 e	10.7 e p
New Zealand	2.4	..	4.3	4.8	5.2 e	5.7 e	..
Norway	6.9 d	9.0 d	9.5 d	9.5 d	9.8 d e	10.6 d e	11.2 e p
Poland	0.8	3.2 b	4.2 d	4.4 d	4.5 d e	4.9 d e	5.5 e p
Portugal	1.0	3.8	4.2	4.5	5.1 e	6.0 e	6.5 e p
Slovak Republic	1.2 d	1.6 d	1.8 d	2.1 d	2.2 d	2.3 d e	2.6 e
Slovenia	2.5	5.8	7.2 d	7.6 d	7.6 d e	8.0 d e	7.9 e p
Spain	2.3	3.4 d	3.5 d	3.7 d	3.6 d e	3.9 d e	4.1 e p
Sweden	12.9 b d	14.8 e	15.7	16.3 e	16.4	17.3 e	19.1 e
Switzerland	..	..	5.8	..	6.2 e	..	..
Türkiye	0.6	2.4	2.7	3.3	3.8	4.6 e	5.0 e
United Kingdom	4.4	4.8	4.8	..	..	..	..
United States	..	9.1	9.4	10.3	10.4	11.7	..
EU27 (from 01/02/2020)	3.7 e	5.8 e	6.1 e	6.4 e	6.6 e	6.9 e	7.3 e
<b>OECD-Total</b>	<b>5.6 e</b>	<b>7.2 e</b>	<b>7.4 e</b>	<b>7.9 e</b>	<b>8.1 e</b>	<b>8.7 e</b>	<b>..</b>
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	1.3	0.7	0.6	0.6	0.6	0.7	0.9 p
Russian Federation	4.7	3.7	3.6	3.4	3.6	3.5	..
Singapore	7.0	6.1	6.1	6.3	6.8	7.5	..
South Africa	0.6 e	0.4	0.5	0.4	0.3	..	..
Chinese Taipei	5.9	10.5	10.7	11.0	11.3	11.8	12.4

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 30. Total business enterprise R&D personnel in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	43 687	..	74 991	..	77 724	..	..
Austria	32 780 d e	51 895 d e	52 478 d	55 369 d e	58 592 d	56 828 d e	60 289 d e
Belgium	31 613	46 564	50 106	53 503	57 661	61 531 e	83 088 d p
Canada	142 030	140 150	141 200	158 460	160 230	..	..
Chile	..	4 946 d	4 525 d	4 474 d e	4 196 d e	3 937 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	21 116 b	37 263	39 968	42 349	44 792	46 234	49 019 p
Denmark	28 359	38 855	36 035	35 443	37 593 p	37 277 p	36 818 p
Estonia	1 398	1 855	2 086	2 150	2 639	2 750	3 114 p
Finland	32 109	27 634	28 148	28 720	29 713	31 480	34 408
France	194 991	255 805	265 701	276 547	283 545	290 720 e p	303 065
Germany	304 502	413 027 e	436 571	451 057 e	475 676	467 444	477 351 p
Greece	11 665 d	9 102 d	13 004 d	13 944 d	14 339 d	15 961 d	17 742 d p
Hungary	7 393	20 825	24 719	31 027 d	33 124 d	34 941 d	37 113
Iceland	1 530	..	1 799 d	..	..	..	3 009
Ireland	10 338	18 203 e	19 542	18 956 e	19 733	20 322 e	..
Israel	43 049 d	83 663 d	90 039 d	95 054 d	107 170 d	110 400 d	..
Italy	70 725 d	164 471 b d	191 960 d	218 822 d	225 056 d	211 789 d	222 037
Japan	609 808 d	586 593 d	603 407 d	611 500 d	617 060 d	624 673 d	641 790 d
Korea	153 400 d	328 948	355 601	383 321	405 212	416 895	445 823
Latvia	1 370 d	896 d	956 d	1 221 d	1 175 d	1 381 d	1 834 p
Lithuania	1 190.0	2 630.0	3 783.0	4 304.0	4 813.0	5 370.0	5 652.0
Luxembourg	3 662	3 234	3 252	3 086	3 241	3 029	2 953 p
Mexico	42 331	26 313	26 506 e	26 529 e	28 471 e	31 280 e	..
Netherlands	48 588	102 614	107 496	112 807	115 124	118 355	124 185 p
New Zealand	6 100	..	14 000	15 000	18 000	19 000	..
Norway	15 399	22 171	23 766	23 766	25 154	26 141	27 145 p
Poland	13 966	55 758 b	72 966 d	85 981 d	86 742 d	96 129 d	105 814 p
Portugal	6 133	19 367	22 022	23 662	26 793	30 872	34 469 p
Slovak Republic	3 524 d	4 643 d	5 654 d	6 524 d	7 113 d	8 032 d	8 262
Slovenia	4 347	9 569	9 954 d	10 471 d	11 326 d	11 088 d	11 395 p
Spain	75 345	90 129 d	95 667 d	104 474 d	106 435 d	104 728 d	116 465 p
Sweden	56 106 b	64 276 e	63 729	67 554 e	64 641	68 303	72 501
Switzerland	..	..	46 510	..	51 623	..	..
Türkiye	14 992	72 579	87 918	104 376	114 931	130 279	149 569
United Kingdom	145 401	215 350	232 656	..	..	..	..
United States	..	1 393 000	1 475 000	1 619 000	1 677 000	1 765 000	..
EU27 (from 01/02/2020)	982 304 e	1 465 174 e	1 572 865 e	1 679 316 e	1 742 303 e	1 757 879 e	1 864 347 e
<b>OECD-Total</b>	<b>..</b>	<b>4 572 276 e</b>	<b>4 858 061 e</b>	<b>5 228 829 e</b>	<b>5 425 915 e</b>	<b>5 571 882 e</b>	<b>..</b>
Argentina	7 155	12 742	12 876	13 918	15 504	16 366	..
China	883 130 d	3 012 081	3 119 809	3 424 780	3 668 433	..	..
Romania	16 157	10 785	11 525	12 081	11 628	11 880	13 711 p
Russian Federation	524 049	402 097	389 191	359 385	390 817	369 430	..
Singapore	17 076	22 329	22 197	23 092	25 399	26 470	..
South Africa	12 236	12 549	12 953	11 691	9 301	..	..
Chinese Taipei	96 714	192 127	196 992	203 456	210 576	219 112	227 574

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 31. Total business enterprise R&D personnel as a percentage of national total**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	68.8 d e	69.0 d e	69.0 d	69.0 d e	70.0 d	69.3 d e	69.3 d e
Belgium	59.1	58.9 e	60.6	60.4	61.7	63.5 e	69.5 d p
Canada	65.0	61.3	60.9	63.2	62.6	..	..
Chile	..	29.8 d	27.2 d	26.6 d e	25.5 d e	24.1 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	48.7 b	56.6	57.3	56.5	56.5	57.1	57.9 p
Denmark	65.2	61.8	59.8	59.3	60.4 p	60.1 p	59.2 p
Estonia	32.0	32.1	34.5	34.8	41.3	42.6	45.9 p
Finland	55.9	58.3	57.4	57.4	57.7	58.8	60.9
France	55.8	59.2	60.1	61.0	61.4	61.8 e p	60.5
Germany	64.1	62.8 e	63.6	63.7 e	64.7	63.7	63.7 p
Greece	34.7 d	21.8 d	27.3 d	27.2 d	26.6 d	27.5 d	29.3 d p
Hungary	31.8	58.2	61.1	56.8 d	58.2 d	58.6 d	60.7
Iceland	47.4	..	56.7 d	..	..	..	68.2
Ireland	61.9	53.0 e	57.8 e	60.4 e	61.3	62.0 e	..
Israel	..	..	..	..	..	..	..
Italy	40.4 d	56.7 b d	60.4 d	63.3 d	63.2 d	61.9 d	62.1
Japan	68.0 d	67.2 d	67.7 d	68.2 b d	68.3 d	68.5 d	68.1 d
Korea	71.2 d	73.5	75.5	76.5	77.1	76.4	77.3
Latvia	25.0 d	17.5 d	17.8 d	21.0 d	19.8 d	21.1 d	26.0 p
Lithuania	10.8	24.1	32.7	36.0	37.0	37.7	38.0
Luxembourg	83.4	59.9	58.6	56.4	56.0	54.5 e p	49.0 p
Mexico	50.6	40.0	40.5 e	41.1 e	42.6 e	44.7 e	..
Netherlands	51.9	71.0	71.5	71.9	71.8	71.1	72.0 p
New Zealand	32.2	..	41.2	..	46.2	..	..
Norway	51.4	50.5	51.4	51.0	51.6	53.4	52.5 p
Poland	18.2	49.9 b	50.6 d	53.1 d	52.9 d	55.4 d	57.1 p
Portugal	23.8	38.4	40.0	40.7	43.6	46.7	49.5 p
Slovak Republic	24.5 d	26.1 d	29.7 d	32.2 d	33.6 d	35.8 d	37.0
Slovenia	48.3	66.4	67.7 d	66.8 d	66.7 d	65.9 d	65.3 p
Spain	43.1	43.8 d	44.3 d	46.3 d	46.0 d	45.2 d	46.7 p
Sweden	72.3 b e	70.9 e	71.7 v	73.4 e	70.1 e v	71.5	73.7
Switzerland	..	..	58.9	..	60.1	..	..
Türkiye	30.4 e	53.0	57.3	60.6	62.9	65.3	67.4
United Kingdom	44.8 b e	50.8 e	52.3	..	..	..	..
United States	..	..	..	..	..	73.1 e	..
EU27 (from 01/02/2020)	52.3 e	57.3 e	58.4 e	59.3 e	59.6 e	59.5 e	60.0 e
<b>OECD-Total</b>	<b>..</b>	<b>62.2 e</b>	<b>63.2 e</b>	<b>64.5 e</b>	<b>65.1 e</b>	<b>65.5 e</b>	<b>..</b>
Argentina	15.8	15.7	16.1	16.6	18.0	19.1	..
China	64.7 d	77.7	77.3	78.2	..	..	..
Romania	48.6	33.5	35.4	37.8	36.7	35.8	40.0 p
Russian Federation	57.0	50.1	50.0	47.4	51.8	49.3	..
Singapore	59.7	49.5	49.9	51.5	52.1	53.7	..
South Africa	42.5	29.5	29.3	26.7	22.2	..	..
Chinese Taipei	64.8	76.7	77.2	77.6	77.5	78.4	79.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 32. Total business enterprise R&D personnel in full-time equivalent per thousand employment in industry**

Per thousand

	2005	2016	2017	2018	2019	2020	2021
Australia	5.9	..	8.5	..	8.4 e	..	..
Austria	11.1 d e	16.0 d e	15.9 d	16.5 d e	17.2 d e	17.1 d e	17.8 d e
Belgium	10.7	14.6	15.5	16.3	17.3	18.6 e	24.6 d e p
Canada	11.6	10.5	10.4	11.5	11.4	..	..
Chile	..	0.8 d	0.7 d	0.7 d e	0.7 d e	0.7 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	5.3 b	8.8	9.4	9.8	10.4	11.0 e	11.6 e p
Denmark	15.3	20.3	18.4	17.7	18.5 e p	18.7 e p	18.1 e p
Estonia	3.0	3.9	4.2	4.3	5.3 e	5.6 e	6.4 e p
Finland	18.8	15.6	15.8	15.7	16.0 e	17.5 e	18.8 e
France	10.8	13.7	14.0	14.4	14.5	15.0 e p	15.2 e
Germany	10.6	13.1 e	13.6	13.9 e	14.6	14.6 e	15.0 e p
Greece	3.2 d	2.7 d	3.8 d	4.0 d	4.1 d	4.7 d e	5.1 d e p
Hungary	2.3	6.2	7.1	8.7 d	9.1 d e	9.7 d e	10.2 e
Iceland	13.0	..	12.7 d	..	..	..	22.7 e
Ireland	6.7	11.8 e	12.3	11.6 e	11.8	12.7 e	..
Israel	22.9 d	32.5 d	34.1 d	35.7 d	39.3 d e	42.2 d e	..
Italy	3.9 d	9.0 b d	10.3 d	11.6 d	11.9 d	11.5 d e	11.9 e
Japan	11.1 d	11.1 d	11.3 d	11.3 d	11.3 d	11.5 d e	11.8 d e
Korea	8.0 d	15.6	16.8	18.1	19.0 e	19.8 e	21.1 e
Latvia	1.8 d	1.3 d	1.4 d	1.8 d	1.7 d e	2.1 d e	2.8 e p
Lithuania	1.1	2.5	3.7	4.1	4.6 e	5.2 e	5.4 e
Luxembourg	15.0	10.0	9.7	8.9	9.0 e	8.4 e	8.0 e p
Mexico	1.7	0.9	0.9 e	0.9 e	0.9 e	1.1 e	..
Netherlands	8.0	15.8	16.2	16.5	16.5 e	17.3 e	17.9 e p
New Zealand	3.9	..	7.5	7.9	9.3 e	9.8 e	..
Norway	10.3	13.1	13.8	13.6	14.1 e	15.0 e	15.5 e p
Poland	1.3	4.4 b	5.7 d	6.7 d	6.7 d e	7.5 d e	8.1 e p
Portugal	1.6	5.5	6.0	6.3	7.1 e	8.4 e	9.2 e p
Slovak Republic	2.2 d	2.5 d	3.0 d	3.4 d	3.7 d	4.3 d e	4.4 e
Slovenia	5.7	12.4	12.5 d	12.7 d	13.4 d e	13.3 d e	13.6 e p
Spain	4.9	6.5 d	6.7 d	7.2 d	7.0 d e	7.3 d e	8.0 e p
Sweden	19.8 b	20.1 e	19.3	20.1 e	19.1	20.6 e	21.9 e
Switzerland	..	..	12.7	..	13.9 e	..	..
Türkiye	0.9	3.3	3.8	4.5	5.2	6.2 e	6.6 e
United Kingdom	6.8	9.3	9.9	..	..	..	..
United States	..	13.0	13.6	14.8	15.2	17.2	..
EU27 (from 01/02/2020)	6.8 e	9.9 e	10.4 e	11.0 e	11.3 e	11.6 e	12.2 e
<b>OECD-Total</b>	<b>..</b>	<b>10.6 e</b>	<b>11.1 e</b>	<b>11.8 e</b>	<b>12.2 e</b>	<b>13.0 e</b>	<b>..</b>
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	2.0	1.5	1.6	1.6	1.6	1.6	1.8 p
Russian Federation	10.3	7.5	7.3	6.7	7.4	7.1	..
Singapore	8.4	7.0	7.0	7.2	7.8	8.6	..
South Africa	1.3 e	1.1	1.1	1.0	0.8	..	..
Chinese Taipei	11.1	19.6	19.9	20.4	21.0	21.9	22.9

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 33. Business-financed BERD (Business enterprise expenditure on R&D) at 2015 prices and PPP**

Million 2015 USD

	2005	2016	2017	2018	2019	2020	2021
Australia	8 402.3	..	10 755.3	..	10 554.8	..	..
Austria	..	..	7 249.9 b	..	7 754.8	..	..
Belgium	4 571.5	..	8 665.5	..	10 855.8	..	..
Canada	12 411.7 d w	10 952.6	11 254.4	12 297.3	12 470.6	12 615.3	12 572.9 p
Chile	..	506.3	439.2	450.7 e	429.1 e	452.7 e	..
Colombia	122.1	670.3	583.1	857.4	1 035.2 e	937.7 e	..
Czech Republic	1 547.7 b	2 314.6	2 567.0	2 889.8	2 900.3	2 637.8	2 786.0 p
Denmark	3 634.9	..	4 867.7	..	5 177.5	..	..
Estonia	110.4	222.2	219.1	229.0	338.6	370.4	..
Finland	4 741.9	3 607.5	3 811.7	3 749.0	3 747.2	3 934.9	..
France	25 490.0	33 086.6	33 621.7 s	34 478.4 s	35 198.7	34 042.9	..
Germany	52 452.1 e	71 515.1 e	77 737.1	79 870.6 e	80 189.7	73 779.5 e	..
Greece	554.3	1 070.9	1 377.1	1 410.4	1 467.9	1 537.1	1 517.3 p
Hungary	740.8 d	1 735.2	1 896.5	2 275.0 b	2 388.1	2 348.6	..
Iceland	157.9	..	..	..	..	..	..
Ireland	1 555.1	1 877.2 e	2 283.0	2 264.9 e	3 130.9	..	..
Israel	4 352.1 d	5 188.7 d	5 191.9 d	5 885.8 d	6 677.7 d	7 815.7 d	..
Italy	9 499.0	15 864.4 b	16 316.6	17 435.1	18 466.5	16 317.8	..
Japan	116 420.3	125 713.0	130 505.7	134 875.8	133 941.8	129 333.8	132 704.1
Korea	24 667.8 d	58 475.7	65 661.3	71 532.3	75 223.6	76 935.4	81 914.4
Latvia	56.6	35.3	50.3	61.5	69.4	81.1	..
Lithuania	83.9	221.9	238.3	290.6	289.3	370.2	..
Luxembourg	594.8	..	395.2	..	400.8	..	..
Mexico	2 908.8	1 559.8	1 367.8 e	1 198.2 e	1 149.8 e	1 081.9 e	..
Netherlands	5 684.3	9 951.3	10 459.8	10 551.0	11 197.2	11 315.9	..
New Zealand	519.0	..	1 042.0	1 158.0	1 248.2	1 301.7	..
Norway	1 772.3	2 567.8	2 740.1	2 739.0	2 905.0	2 918.7	..
Poland	1 034.4	5 278.6 b	5 866.4	7 310.9	7 985.1	8 214.8	..
Portugal	828.2	1 735.3	1 942.2	2 077.4	2 254.9	2 591.2	..
Slovak Republic	187.9	559.6	701.3	707.6	687.2	677.3	..
Slovenia	414.8	908.3	805.3	871.4	928.7	745.8	..
Spain	7 317.6	8 788.8	9 419.7	10 219.9	10 358.0	10 386.4	..
Sweden	8 334.8 b	..	10 097.4	..	10 914.8	..	..
Switzerland	..	..	10 562.7	..	11 420.4	..	..
Türkiye	2 129.5	9 026.8	10 450.9	12 534.6	13 833.1	14 589.6	18 454.6
United Kingdom	15 073.8	..	..	44 557.1 b p	45 321.0 p	43 240.6 p	47 075.2 p
United States	244 367.0 d w	332 514.6 b	342 705.0	369 507.5	408 141.3	438 598.9	475 121.3 p
EU27 (from 01/02/2020)	134 225.7 e	189 931.2 e	202 678.2 e	211 569.2 e	218 974.2 e	209 103.3 e	..
<b>OECD-Total</b>	<b>586 545.7 e</b>	<b>797 308.6 e</b>	<b>835 200.4 e</b>	<b>888 509.8 e</b>	<b>941 156.5 e</b>	<b>959 736.7 e</b>	<b>1 021 849.1 e</b>
Argentina	813.8	804.7	856.2	887.4	911.9	906.9	..
China	57 984.8	292 918.7	317 317.5	343 852.0	379 621.1	..	..
Romania	381.8	919.8	1 194.5	1 330.8	1 257.4	1 191.1	..
Russian Federation	6 847.5	8 798.6	9 827.0	8 532.6	9 423.8	9 398.0 e	..
Singapore	3 466.0	5 075.0	4 906.7	4 928.2	5 542.6	6 470.3	..
South Africa	1 838.6	2 015.4	2 276.1	2 018.2	1 202.0	..	..
Chinese Taipei	11 822.6	26 536.3	28 959.5	31 713.7	34 349.2	37 586.9	42 615.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 34. Business-financed BERD (Business enterprise expenditure on R&D) as a percentage of value added in industry**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	1.46	..	1.38	..	1.33 e	..	..
Austria	..	..	2.48 b	..	2.55 e	..	..
Belgium	1.59	..	2.62	..	3.15	..	..
Canada	1.36 d w	1.10	1.07	1.13	1.14	1.22 e	1.12 e p
Chile	..	0.18	0.16	0.15 e	0.15 e	0.16 e	..
Colombia	0.05	0.16	0.14	0.19	0.23 e	0.23 e	..
Czech Republic	0.76 b	0.92	0.97	1.07	1.04	1.02 e	1.04 e p
Denmark	2.43	..	2.80	..	2.85 e	..	..
Estonia	0.49	0.89	0.82	0.82	1.18 e	1.30 e	..
Finland	3.49	2.65	2.66	2.59	2.56 e	2.79 e	..
France	1.73	2.09	2.08 s	2.09 s	2.08	2.24 e	..
Germany	2.41 e	2.82 e	2.98	3.04 e	3.05	2.95 e	..
Greece	0.25	0.69	0.86	0.87	0.88	1.02 e	0.91 e p
Hungary	0.49 d	1.03	1.08	1.23 b	1.24 e	1.30 e	..
Iceland	1.94	..	..	..	..	..	..
Ireland	0.98	0.74 e	0.81	0.74 e	0.98	..	..
Israel	3.66 d e	2.81 d	2.71 d e	2.95 d e	3.21 d e	3.83 d e	..
Italy	0.64	1.14 b	1.15	1.21	1.27	1.26 e	..
Japan	3.13	3.35	3.41	3.51	3.53	3.56 e	3.57 e
Korea	2.59 d e	4.23	4.61	4.91	5.10 e	5.31 e	5.43 e
Latvia	0.20	0.11	0.16	0.18	0.20 e	0.24 e	..
Lithuania	0.2	0.4	0.4	0.4	0.4 e	0.6 e	..
Luxembourg	1.87	..	0.89	..	0.87 e	..	..
Mexico	0.22	0.09	0.08 e	0.07 e	0.06 e	0.07 e	..
Netherlands	1.14	1.77	1.81	1.80	1.88 e	2.01 e	..
New Zealand	0.56	..	0.86	0.92	0.98 e	1.02 e	..
Norway	0.97	1.39	1.41	1.34	1.49 e	1.66 e	..
Poland	0.22	0.71 b	0.75	0.89	0.94 e	0.99 e	..
Portugal	0.45	0.95	1.02	1.07	1.13 e	1.46 e	..
Slovak Republic	0.24	0.50	0.61	0.60	0.57	0.60 e	..
Slovenia	1.07	2.06	1.73	1.78	1.83 e	1.56 e	..
Spain	0.71	0.84	0.87	0.92	0.92 e	1.08 e	..
Sweden	3.38 b	..	3.22	..	3.35	..	..
Switzerland	..	..	2.74	..	2.86 e	..	..
Türkiye	0.25	0.63	0.66	0.76	0.83	0.87 e	0.94 e
United Kingdom	0.99	..	..	2.45 b p	2.45 p	2.68 e p	2.72 e p
United States	2.43 d w	2.85 b	2.86	2.99	3.22	3.62 e	3.61 e p
EU27 (from 01/02/2020)	1.39 e	1.74 e	1.80 e	1.84 e	1.87 e	1.93 e	..
<b>OECD-Total</b>	<b>1.96 e</b>	<b>2.24 e</b>	<b>2.27 e</b>	<b>2.36 e</b>	<b>2.46 e</b>	<b>2.66 e</b>	<b>..</b>
Argentina	0.19	0.15 e	0.16 e	0.17 e	0.18 e	0.19 e	..
China	0.94 e	1.87 e	1.90 e	1.94 e	2.02 e	..	..
Romania	0.17	0.30	0.36	0.38	0.35	0.34	..
Russian Federation	0.38 e	0.37	0.40	0.34	0.37	0.39	..
Singapore	1.48 e	1.27 e	1.17 e	1.11 e	1.23 e	1.50 e	..
South Africa	0.47 e	0.43 e	0.48 e	0.42 e	0.25 e	..	..
Chinese Taipei	2.07 e	3.10	3.25	3.47	3.67	3.86	4.03

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 35. Percentage of Business enterprise expenditure on R&D (BERD) financed by the business enterprise sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	94.0	..	96.0	..	95.1	..	..
Austria	..	..	75.5 b	..	75.3	..	..
Belgium	82.8	..	86.3	..	83.6	..	..
Canada	82.5 d w	73.8	75.7	76.6	75.3	75.0	75.0 p
Chile	..	87.8	86.1	83.8 e	85.3 e	91.7 e	..
Colombia	98.1	97.7	98.5	98.4	99.0 e	98.8 e	..
Czech Republic	78.8 b	61.8	59.9	61.7	59.5	56.2	55.4 p
Denmark	86.0	..	88.5	..	94.0	..	..
Estonia	80.3	87.7	86.8	88.2	86.3	85.8	..
Finland	90.9	84.0	86.7	82.9	80.6	81.7	..
France	80.7	83.2	83.2 s	83.6 s	83.5	83.2	..
Germany	92.1 e	89.7 e	90.4	90.4 e	88.2	88.2 e	..
Greece	85.7	87.6	84.1	81.5	82.7	80.5	74.4 p
Hungary	77.8 d	73.6 d	70.1 d	67.4 b d	69.5 d	65.0 d	..
Iceland	84.9	..	..	..	..	..	..
Ireland	86.1	66.8 e	68.0	68.0 e	83.0	..	..
Israel	67.2 d	42.7 d	39.0 d	41.1 d	40.3 d	43.5 d	..
Italy	76.8	84.1 b	82.7	83.2	85.5	82.3	..
Japan	98.3	98.1	98.2	98.4	98.5	98.4	98.2
Korea	94.4 d	94.8	93.8	93.3	93.7	94.6	94.0
Latvia	61.7	65.6	69.3	71.3	74.5	70.0	..
Lithuania	83.9	87.7	80.7	79.6	69.1	71.3	..
Luxembourg	91.7	..	87.5	..	92.2	..	..
Mexico	86.8	79.1	79.2 e	77.3 e	77.9 e	77.2 e	..
Netherlands	79.0	80.9	80.8	81.0	82.2	81.5	..
New Zealand	80.5	..	75.8	75.7	74.8	75.1	..
Norway	81.6	77.1	78.0	78.2	78.4	78.7	..
Poland	83.0	79.1 b	79.5	78.5	78.7	78.9	..
Portugal	91.4	89.3	90.0	89.7	89.8	89.7	..
Slovak Republic	67.9	84.8	85.6	88.0	83.5	79.1	..
Slovenia	85.3	88.7	81.8	81.8	80.8	65.1	..
Spain	79.9	82.2	82.3	82.8	82.2	83.2	..
Sweden	86.1 b	..	83.6	..	85.8	..	..
Switzerland	..	..	91.6	..	91.1	..	..
Türkiye	90.8	84.9	85.9	87.5	86.7	87.0	87.3
United Kingdom	64.5	..	..	79.4 b p	80.2 p	77.7 p	79.3 p
United States	90.3 d w	86.0 b	84.7	85.1	86.1	85.9	86.3 p
EU27 (from 01/02/2020)	84.6 e	84.4 e	84.8 e	84.7 e	84.3 e	83.4 e	..
<b>OECD-Total</b>	<b>89.4 e</b>	<b>86.8 e</b>	<b>86.3 e</b>	<b>86.4 e</b>	<b>86.6 e</b>	<b>86.2 e</b>	..
Argentina	94.5	74.8	65.1	67.4	64.0	61.4	..
China	91.2	94.7	95.0	95.6	96.1	..	..
Romania	57.5	77.3	87.0	89.0	86.9	85.4	..
Russian Federation	37.3	38.5	40.9	41.9	39.6	41.2	..
Singapore	87.8	84.8	84.0	84.7	87.7	89.2	..
South Africa	68.3	85.1	94.4	95.4	79.8	..	..
Chinese Taipei	97.7	98.5	98.6	98.5	98.6	98.5	98.6

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 36. Percentage of Business enterprise expenditure on R&D (BERD) financed by government**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	4.0	..	2.4	..	2.9	..	..
Austria	..	..	3.7 b	..	3.7	..	..
Belgium	6.2	..	3.4	..	3.7	..	..
Canada	2.6 d	5.4	6.8	6.0	6.0	7.0	7.0 p
Chile	..	11.7	13.0	15.7 e	10.1 e	7.9 e	..
Colombia	1.9	2.3	1.5	1.6	1.0 e	1.2 e	..
Czech Republic	15.6 b	6.1	7.0	7.0	6.8	6.8	5.9 p
Denmark	2.4 d	..	2.1 d	..	2.5 d	..	..
Estonia	6.9	4.7	4.4	5.7	5.4	5.7	..
Finland	3.8	3.6	3.1	2.8	2.5	3.7	..
France	10.1	7.7	8.0 s	7.5 s	7.7	8.5	..
Germany	4.5 e	3.4 e	3.2	3.1 e	3.2	3.2 e	..
Greece	5.6	3.3	4.1	6.0	6.3	7.5	12.5 p
Hungary	3.9 d	8.3 d	13.6 d	16.3 b d	16.4 d	15.7 d	..
Iceland	2.8	..	..	..	..	..	..
Ireland	4.1	5.0 e	4.6	4.6 e	3.5	..	..
Israel	4.8 d	2.8 d	2.8 d	2.4 d	2.0 d	2.0 d	..
Italy	11.0	3.5 b	3.5	4.9	4.2	4.7	..
Japan	1.2	0.9	0.9	0.8	0.8	0.9	1.0
Korea	4.6 d	4.2	4.7	4.4	4.4	5.3	5.8
Latvia	12.7	2.6	6.1	3.7	3.7	5.9	..
Lithuania	1.8	1.5	1.2	1.6	1.3	1.0	..
Luxembourg	5.2	..	6.5	..	5.7	..	..
Mexico	11.0	18.8	18.4 e	19.9 e	18.9 e	19.2 e	..
Netherlands	3.4	6.0	5.7	6.4	6.1	6.7	..
New Zealand	11.4	..	11.9	11.7	10.9	11.7	..
Norway	7.9	9.4	9.4	9.9	10.0	10.6	..
Poland	13.7	16.3 b	13.9	13.5	13.4	13.6	..
Portugal	4.2	3.8	4.2	5.6	5.8	6.4	..
Slovak Republic	26.7	3.7	2.5	2.5	3.4	3.6	..
Slovenia	7.0	3.1	5.3	6.2	7.7	7.2	..
Spain	13.6	8.9	8.7	9.0	9.6	9.6	..
Sweden	4.5 b	..	4.7	..	4.3	..	..
Switzerland	..	..	1.1	..	1.6	..	..
Türkiye	6.9	9.9	9.0	10.0	11.7	10.9	10.9
United Kingdom	8.3	..	..	6.3 b p	6.0 p	7.1 p	7.1 p
United States	9.7 d	6.2 b	6.0	5.5	4.5	5.4	5.1 p
EU27 (from 01/02/2020)	7.3 e	5.4 e	5.1 e	5.3 e	5.2 e	5.8 e	..
<b>OECD-Total</b>	<b>6.7 e</b>	<b>5.1 e</b>	<b>5.0 e</b>	<b>4.8 e</b>	<b>4.4 e</b>	<b>5.1 e</b>	<b>..</b>
Argentina	4.5	2.0	3.4	1.9	1.3	0.9	..
China	4.6	3.7	3.4	3.2	3.8	..	..
Romania	36.8	12.2	7.2	4.9	4.9	5.2	..
Russian Federation	53.6	59.0	56.6	56.2	57.3	56.4	..
Singapore	6.3	5.0	4.6	4.4	4.5	4.5	..
South Africa	16.2	3.1	2.3	1.5	6.1	..	..
Chinese Taipei	2.2	1.4	1.3	1.4	1.3	1.5	1.4

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 37. Percentage of Business enterprise expenditure on R&D (BERD) financed by the Higher Education and PNP sectors**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	0.33	..	0.02	..	0.04	..	..
Austria	..	..	0.12	..	0.04	..	..
Belgium	0.04	..	0.05	..	0.62	..	..
Canada	.. k	1.34	1.48	1.21	0.37	0.22	0.21 p
Chile	..	0.08	0.10	0.17 e	0.15 e	0.15 e	..
Colombia	0.00	0.00	0.00	0.00	0.00 e	0.00 e	..
Czech Republic	0.10 b	0.07	0.08	0.07	0.07	0.06	0.05 p
Denmark	0.16 d	..	0.79 d	..	0.46 d	..	..
Estonia	0.01	0.07	0.04	0.12	0.05	0.05	..
Finland	0.01	0.02	0.03	0.02	0.05	0.04	..
France	0.05	0.07	0.08 s	0.09 s	0.12	0.08	..
Germany	0.17 d	0.19 d e	0.13 d	0.13 d e	0.15 d	0.15 e	..
Greece	0.37	0.02	0.05	0.03	0.09	0.10	0.08 p
Hungary	0.06 d	0.05 d	0.04 d	0.03 b d	0.06 d	0.09 d	..
Iceland	0.00	0.06 d e	0.04 d	0.04 d e	0.08 d	0.10 d e	0.09 d
Ireland	0.00	0.03 e	0.14	0.14 e	0.00	..	..
Israel	0.61 d	0.53 d	0.49 d	0.48 d	0.42 d	0.42 d	..
Italy	0.11	0.14 b	0.14	0.14	0.15	0.16	..
Japan	0.10	0.09	0.10	0.07	0.03	0.10	0.09
Korea	0.06 d	0.04	0.05	0.06	0.05	0.06	0.06
Latvia	..	..	..	..	..	..	..
Lithuania	0.2	0.1	0.1	0.1	0.2	0.2	..
Luxembourg	0.02	..	..	..	..	..	..
Mexico	0.02	0.84	0.95 e	1.06 e	1.17 e	1.22 e	..
Netherlands	0.33	0.65	0.73	0.92	0.97	1.04	..
New Zealand	1.05	..	.. c	1.70	1.62	1.48	..
Norway	0.01	0.04	0.00	0.02	0.02	0.01	..
Poland	0.08	0.10 b	0.11	0.06	0.08	0.24	..
Portugal	0.00	0.03	0.03	0.02	0.04	0.05	..
Slovak Republic	0.03	0.00	0.00	0.00	0.00	0.00	..
Slovenia	0.48	0.00	0.53	.. c	0.05	.. c	..
Spain	0.68	0.24	0.22	0.18	0.21	0.15	..
Sweden	0.20 b	..	0.17	..	0.21	..	..
Switzerland	..	..	0.50	..	0.38	..	..
Türkiye	2.02 d	0.12	0.27	0.16	0.03	0.12	0.05
United Kingdom	0.02 d	..	..	0.51 b p	0.41 p	0.62 p	0.58 p
United States	.. k	0.26 b	0.15	0.10	0.14	0.15	0.14 p
EU27 (from 01/02/2020)	0.16 e	0.18 e	0.17 e	..	0.21 e	..	..
<b>OECD-Total</b>	<b>..</b>	<b>0.24 e</b>	<b>0.19 e</b>	<b>0.17 e</b>	<b>0.17 e</b>	<b>0.18 e</b>	<b>..</b>
Argentina	0.00	0.03	0.03	0.01	0.07	0.05	..
China	..	..	..	..	..	..	..
Romania	0.16	0.32	0.34	0.08	0.00	0.12	..
Russian Federation	0.04	0.05	0.05	0.05	0.05	0.11	..
Singapore	0.08	0.01	0.05	0.01	0.01	0.11	..
South Africa	1.02	2.72	0.32	0.31	3.23	..	..
Chinese Taipei	0.04	0.01	0.02	0.01	0.01	0.01	0.01

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 38. Percentage of Business enterprise expenditure on R&D (BERD) financed by the rest of the world**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	1.6	..	1.6	..	1.9	..	..
Austria	..	..	20.7	..	21.0	..	..
Belgium	11.0	..	10.2	..	12.1	..	..
Canada	14.9 d	19.5	16.1	16.2	18.3	17.8	17.8 p
Chile	..	0.5	0.8	0.4 e	4.5 e	0.3 e	..
Colombia	0.0	0.0	0.0	0.0	0.0 e	0.0 e	..
Czech Republic	5.4 b	32.0	33.0	31.2	33.6	36.9	38.6 p
Denmark	11.4	..	8.6	..	3.1	..	..
Estonia	12.7	7.5	8.7	5.9	8.3	8.4	..
Finland	5.3 b	12.4	10.2	14.3	16.8	14.6	..
France	9.2	9.0	8.8 s	8.6 s	8.7	8.2	..
Germany	3.3	6.7 e	6.3	6.3 e	8.5	8.5 e	..
Greece	8.3	9.1	11.7	12.5	10.9	11.9	13.1 p
Hungary	18.1 d	18.0 d	16.3 d	16.3 b d	14.1 d	19.1 d	..
Iceland	12.2	28.4 d e	32.8 d	24.8 d e	36.5 d	36.2 d e	27.7 d
Ireland	9.8	28.2 e	27.3	27.3 e	13.5	..	..
Israel	27.4 d	53.9 d	57.7 d	56.0 d	57.2 d	54.1 d	..
Italy	12.1	12.2 b	13.6	11.7	10.2	12.9	..
Japan	0.4	0.9	0.8	0.7	0.7	0.6	0.7
Korea	0.9 d	1.0	1.4	2.2	1.8	0.1	0.2
Latvia	25.6	31.9	24.5	25.1	21.8	24.1	..
Lithuania	14.1	10.7	18.0	18.7	29.4	27.5	..
Luxembourg	3.1	..	5.9	..	2.1	..	..
Mexico	2.1	1.3	1.5 e	1.7 e	2.0 e	2.4 e	..
Netherlands	17.2	12.5	12.8	11.7	10.7	10.8	..
New Zealand	7.0	..	11.1	10.8	12.7	11.7	..
Norway	10.5	13.5	12.6	11.9	11.5	10.7	..
Poland	3.2	4.4 b	6.5	7.9	7.8	7.3	..
Portugal	4.5	6.9	5.7	4.7	4.4	3.8	..
Slovak Republic	5.3	11.5	11.9	9.4	13.1	17.3	..
Slovenia	7.2	8.2	12.4	11.9	11.5	27.7	..
Spain	5.8	8.6	8.7	8.0	8.0	7.1	..
Sweden	9.1 b	..	11.6	..	9.6	..	..
Switzerland	..	..	6.8	..	7.0	..	..
Türkiye	0.3	5.0	4.9	2.4	1.5	2.0	1.7
United Kingdom	27.1	..	..	13.8 b p	13.4 p	14.6 p	13.0 p
United States	.. k	7.5 b	9.2	9.3	9.2	8.5	8.5 p
EU27 (from 01/02/2020)	7.9 e	10.0 e	10.0 e	9.8 e	10.3 e	10.6 e	..
<b>OECD-Total</b>	<b>..</b>	<b>7.9 e</b>	<b>8.6 e</b>	<b>8.6 e</b>	<b>8.8 e</b>	<b>8.5 e</b>	<b>..</b>
Argentina	1.0	23.2	31.4	30.6	34.7	37.6	..
China	1.0	0.8	0.8	0.4	0.1	..	..
Romania	5.5	10.3	5.5	5.9	8.2	9.3	..
Russian Federation	9.1	2.5	2.4	1.8	3.1	2.3	..
Singapore	5.9	10.2	11.3	10.9	7.8	6.2	..
South Africa	14.5	9.1	3.0	2.8	10.9	..	..
Chinese Taipei	0.0	0.1	0.1	0.1	0.1	0.0	0.0

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 39. Business enterprise expenditure on R&D (BERD) performed in the pharmaceutical industry at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	178.0 e	..	..	..	..	..	..
Austria	269.7 e	396.0 e	400.8	397.7 e	377.4	..	..
Belgium	814.5 e	2 617.4	2 871.3	3 456.5	3 866.6	..	..
Canada	878.1 d e	410.9 d	452.9 d	455.0 d	400.1 d	396.7 d	..
Chile	..	39.7 e	40.0	48.7	..	..	..
Colombia	..	..	..	..	..	..	..
Czech Republic	55.1	90.5	89.6	111.4	101.8	105.6	..
Denmark	..	1 484.8	1 407.4	1 376.2 e	1 313.7	1 552.7	..
Estonia	..	0.8	1.4	1.1	1.2	..	..
Finland	..	162.9	170.9	174.8	192.1 e	210.7 e	..
France	..	1 087.7	1 078.7	..	..	..	..
Germany	3 891.4 e	6 003.0	6 217.8	7 106.4	7 461.6	7 237.9	..
Greece	..	69.6 e	88.1	107.0 e	138.0	175.0	..
Hungary	279.2 e	414.5	400.1	554.8	495.2	720.6	..
Iceland	..	1.4	1.1	1.4	0.3	0.4	..
Ireland	..	280.6 e	430.2	387.8 e	402.8	..	..
Israel	..	341.7 d	263.3 d	194.4 d	197.0 d	211.9 d	..
Italy	452.2 e	841.7	868.5	895.4	999.3	1 164.7	..
Japan	8 087.5	12 808.7	13 941.7	13 485.8	12 846.8	12 873.5	13 669.3
Korea	444.0	1 511.3	1 629.6	1 848.3	2 067.1	2 588.3	2 784.5
Latvia	..	5.7	8.5	9.3	9.8	10.3	..
Lithuania	..	1.2 e	1.6 e	1.8	7.9	1.4	..
Luxembourg	..	..	..	..	..	..	..
Mexico	216.8	126.7	112.2	101.5	96.6	..	..
Netherlands	..	296.2	319.6	..	..	..	..
New Zealand	..	..	..	..	..	..	..
Norway	52.1 e	35.5	41.5	44.7	44.7	44.8	..
Poland	71.0	179.9	262.8	303.4	270.1	201.9	..
Portugal	63.8 e	154.1	173.6	204.5	162.8	162.3	..
Slovak Republic	..	10.7	5.8	5.0	4.7	4.0	..
Slovenia	124.1 e	311.6	..	..	..	..	..
Spain	711.1 e	982.4	1 106.1	1 195.0	1 283.9	1 245.6	..
Sweden	..	828.0 e	851.5 e	797.7 e	801.7 e	..	..
Switzerland	2 310.1 e	3 821.4 e	4 180.4	4 451.0 e	4 488.7	..	..
Türkiye	..	176.8	226.9	357.5	227.4	264.7	..
United Kingdom	..	..	..	..	..	..	..
United States	34 839.0	64 781.0	67 374.0	75 624.0	88 644.0	92 210.0	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	..	..	..	..	..	..	..
China	..	12 246.0	12 767.7	13 735.1	14 484.6	..	..
Romania	19.2 e	37.0	20.9	20.8	23.5	25.2	..
Russian Federation	..	..	..	..	..	..	..
Singapore	76.9 e	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	118.1	535.3	530.3	504.6	491.8	569.5	614.7

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry



**Table 40. Business enterprise expenditure on R&D (BERD) performed in the computer, electronic and optical industry at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	182.7 e	..	..	..	..	..	..
Austria	1 234.0 e	1 008.5 e	1 065.6	1 203.4 e	1 366.4	..	..
Belgium	556.1 e	625.0	682.3	596.6	750.0	..	..
Canada	2 398.6 d e	951.9 d	965.1 d	964.8 d	984.8 d	1 037.4 d	..
Chile	..	1.3 e	1.3	2.1	..	..	..
Colombia	..	..	..	..	..	..	..
Czech Republic	105.2	185.6	206.7	236.5	289.1	267.6	..
Denmark	..	492.1	518.7	545.0 e	560.3	452.7	..
Estonia	..	17.0	26.2	29.0	53.3	..	..
Finland	2 111.4 e	1 318.1	1 292.3	1 278.4	1 294.2	1 381.0	..
France	..	4 929.3	4 885.6	..	..	..	..
Germany	6 607.9 e	10 147.5	10 391.5	11 259.3	11 975.7	11 939.5	..
Greece	..	24.8 e	34.6	35.9 e	33.5	24.7	..
Hungary	57.2 e	45.8	44.7	67.1	82.2	100.7	..
Iceland	..	2.9	3.6	4.2	7.5	6.7	..
Ireland	..	313.4 e	338.2	398.0 e	515.2	..	..
Israel	1 486.5 d e	1 545.3 d	1 691.0 d	2 160.2 d	2 203.9 d	2 074.2 d	..
Italy	1 518.7 e	1 391.9	1 494.9	1 583.7	1 660.7	1 693.1	..
Japan	..	24 901.7	25 398.4	26 591.7	25 467.7	28 093.7	23 698.6
Korea	11 753.5	31 758.2	36 759.2	41 596.4	42 391.8	43 538.7	46 699.0
Latvia	..	7.4	6.6	11.1	6.6	9.9	..
Lithuania	..	18.9	35.2	36.3	42.7	53.2	..
Luxembourg	..	..	..	..	..	..	..
Mexico	73.0	82.2	72.8	65.8	62.7	..	..
Netherlands	..	814.3	868.1	..	..	..	..
New Zealand	..	..	..	..	..	..	..
Norway	178.9 e	188.6	196.0	219.8	222.5	226.4	..
Poland	29.3	125.7	174.7	411.1	477.5	580.6	..
Portugal	121.8 e	64.1	63.7	62.6	66.4	90.1	..
Slovak Republic	12.4	12.2	11.8	13.5	12.4	14.0	..
Slovenia	66.7 e	57.1	59.7	49.6	62.8	58.8	..
Spain	319.2 e	263.8	304.9	321.3	344.2	300.9	..
Sweden	..	1 200.2 e	255.4	260.3 e	284.4	..	..
Switzerland	794.3 e	1 678.8 e	1 558.6	1 630.3 e	1 767.0	..	..
Türkiye	279.2 e	1 408.3	1 888.1	2 273.8	2 424.0	2 419.5	..
United Kingdom	..	..	..	..	..	..	..
United States	49 725.0 e	78 693.0	78 930.0	85 489.0	87 128.0	100 980.0	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	..	..	..	..	..	..	..
China	..	50 056.7	52 894.3	59 186.6	63 615.8	..	..
Romania	8.3 e	44.9	15.1	5.3	12.9	27.4	..
Russian Federation	..	..	..	..	..	..	..
Singapore	1 453.2 e	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	7 233.9	19 437.5	21 282.3	23 853.4	26 748.8	30 246.6	36 478.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

**Table 41. Business enterprise expenditure on R&D (BERD) performed in the aerospace industry at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	39.3 e	..	..	..	..	..	..
Austria	5.7 e	80.1 e	75.5	72.5 e	69.3	..	..
Belgium	77.9 e	..	..	..	..	..	..
Canada	708.6 d e	1 256.8 d	1 118.5 d	866.1 d	689.2 d	478.8 d	..
Chile	..	..	..	..	..	..	..
Colombia	..	..	..	..	..	..	..
Czech Republic	37.6	61.5	92.8	84.2	139.7	98.9	..
Denmark	..	..	2.8	3.3 e	3.8	4.1	..
Estonia	0.0	0.0	0.0	0.0	0.0	..	..
Finland	..	6.8	8.0 e	8.4 e	3.7 e	17.4 e	..
France	..	3 657.1	3 412.2	..	..	..	..
Germany	2 285.8 e	2 300.7	2 002.3	2 321.2	2 052.4	1 776.4	..
Greece	..	..	..	..	..	..	..
Hungary	..	..	..	..	..	11.4	..
Iceland	..	0.0	0.0	0.0	0.0	0.0	..
Ireland	..	..	..	..	..	..	..
Israel	..	..	..	..	..	..	..
Italy	924.0 e	1 727.2	1 837.6	1 742.2	1 811.6	1 883.0	..
Japan	12.4	733.3	834.3	788.6	627.7	1 074.1	580.9
Korea	165.5	440.2	391.2	419.7	516.5	472.9	488.7
Latvia	..	..	..	..	..	..	..
Lithuania	..	..	..	..	..	0.2	..
Luxembourg	..	..	..	..	..	..	..
Mexico	0.4	34.3	30.3	27.4	26.1	..	..
Netherlands	..	..	..	..	..	..	..
New Zealand	..	..	..	..	..	..	..
Norway	..	1.0 e	0.9 e	1.7 e	..	..	..
Poland	30.4	100.5	116.8	128.4	156.5	125.2	..
Portugal	..	0.9	4.4	5.6	5.9	4.3	..
Slovak Republic	..	..	..	..	..	..	..
Slovenia	0.0 e	1.7	..	..	..	..	..
Spain	386.8 e	631.6	656.7	723.3	774.9	815.9	..
Sweden	..	..	..	..	..	..	..
Switzerland	..	..	..	..	..	..	..
Türkiye	..	..	..	..	..	..	..
United Kingdom	..	..	..	..	..	..	..
United States	15 005.0	27 326.0	26 661.0	24 619.0	18 708.0 e	23 086.0	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	..	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	..	2.1	4.3	7.6	11.3	22.8	..
Russian Federation	..	..	..	..	..	..	..
Singapore	22.0 e	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	..	..	..	..	..	..	..

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

**Table 42. Business enterprise expenditure on R&D (BERD) performed in service industries at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	3 085.1 e	7 197.8 e	7 260.3	7 730.4 e	7 889.5	..	..
Austria	1 306.3 e	3 506.3 e	3 341.0	3 510.6 e	3 813.2	..	..
Belgium	1 253.5 e	3 896.8	4 546.0	5 356.0	6 935.8	..	..
Canada	5 189.8 d e	8 701.0 d e	9 076.9 d	10 358.7 d	11 170.1 d	12 055.7 d	..
Chile	..	245.5	245.1	289.4	..	..	..
Colombia	..	..	..	..	..	..	..
Czech Republic	556.0	1 738.6	2 036.3	2 250.9	2 478.5	2 614.6	..
Denmark	..	2 787.4	2 505.2	2 872.0 e	3 188.8	2 802.2	..
Estonia	50.4	175.4	170.1	188.0	280.4	..	..
Finland	737.2 e	1 381.7	1 514.3	1 669.3	1 840.5	2 021.7	..
France	..	19 279.4	20 823.2	..	..	..	..
Germany	4 682.3 e	12 029.1	13 210.7	13 723.1	15 051.0	15 421.9	..
Greece	..	822.6 e	1 074.1	1 161.0 e	1 242.2	1 309.4	..
Hungary	162.6 e	1 200.9	1 404.7	1 720.0	1 881.6	1 734.1	..
Iceland	..	179.8	184.3	180.0	265.7	262.8	..
Ireland	..	1 646.5 e	1 896.1	2 028.0 e	2 455.2	..	..
Israel	3 497.4 d e	10 156.9 d	11 324.6 d	11 895.8 d	13 987.1 d	15 939.5 d	..
Italy	2 584.7 e	5 738.9	6 341.3	7 140.0	7 980.9	7 154.9	..
Japan	9 828.6	14 892.8	15 493.8	16 376.3	15 543.2	11 503.1	17 463.9
Korea	1 611.2	5 432.5	5 982.8	7 293.3	8 853.5	10 044.1	11 616.5
Latvia	..	..	33.5	..	..	..	..
Lithuania	..	173.3 e	204.5	223.3	306.5	427.1	..
Luxembourg	..	..	185.5	..	169.0	..	..
Mexico	457.5	735.8	651.6	589.5	561.2	..	..
Netherlands	..	4 045.2	4 182.1	..	..	..	..
New Zealand	202.2	743.9 e	944.8	1 037.4	1 224.7	1 366.6	..
Norway	886.3 e	2 028.7	2 287.8	2 370.8	2 605.9	2 699.3	..
Poland	461.3	4 371.9 e	4 425.8	5 317.8 e	6 130.3 e	7 093.9 e	..
Portugal	314.5 e	1 117.9	1 299.2	1 387.2	1 585.6	1 967.7	..
Slovak Republic	117.1 e	187.9	226.8	231.2	290.8 e	455.6	..
Slovenia	71.0 e	255.3	262.0 e	294.9 e	331.7 e	350.4 e	..
Spain	2 975.2 e	5 428.2	6 000.6	6 741.1	7 289.0	7 277.2	..
Sweden	..	4 237.1 e	5 563.4	5 901.2 e	6 678.5 e	..	..
Switzerland	1 238.9 e	3 672.1 e	3 491.6	3 813.1 e	4 325.5	..	..
Türkiye	343.3 e	4 473.9	4 888.1	5 625.8	5 935.2	6 875.7	..
United Kingdom	..	..	..	..	..	..	..
United States	65 828.5 e	125 384.5 e	144 589.5 e	169 118.0 e	207 880.5 e	232 394.0 e	..
EU27 (from 01/02/2020)	..	..	..	..	..	..	..
<b>OECD-Total</b>	..	..	..	..	..	..	..
Argentina	..	323.6	530.8	598.3	724.3	821.9	..
China	..	..	..	..	..	..	..
Romania	47.1 e	774.7	954.7	1 103.8	1 142.2	1 017.4	..
Russian Federation	..	..	..	..	..	..	..
Singapore	1 243.2 e	..	..	..	..	..	..
South Africa	844.2	..	..	..	..	..	..
Chinese Taipei	734.0	2 171.0	2 397.7	2 653.7	2 764.6	3 011.3	3 395.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, ANBERD database: Research and Development Expenditure in Industry

**Table 43. Higher education expenditure on R&D (HERD) at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	7 500.9	7 603.8 e	8 268.3	8 591.2 e	8 712.6	..
Austria	1 689.8 e	3 187.4 b e	3 268.6	3 492.0 e	3 619.4	3 653.2 e	3 826.8 e
Belgium	1 389.2	2 939.9	3 034.7	3 162.2	3 380.0	3 564.0 e	3 362.7 p
Canada	7 841.7	11 446.1	11 849.3	12 519.4	12 805.3	12 915.1	12 995.6 p
Chile	..	678.7 b p	737.7	830.0 e	818.9 e	767.5 e	..
Colombia	281.1	522.6	526.7	680.1	617.3	475.2	..
Czech Republic	486.2	1 302.6	1 427.9	1 784.1	1 981.9	1 966.1	1 941.6 p
Denmark	1 090.8	2 980.3	3 107.5	3 321.3	3 485.2	3 643.2	3 643.9 p
Estonia	85.6	182.0	225.5	302.3	297.9	308.3	340.7 p
Finland	1 064.0	1 691.2	1 814.6	1 902.0	2 033.1	2 068.8	2 093.8
France	7 442.5	13 074.9	13 535.4	14 039.1	14 996.8	15 216.3	15 593.8
Germany	10 726.2	22 092.1 b	23 204.5	25 018.4	26 327.1	27 530.9	27 988.9 p
Greece	772.6	950.3	1 003.1	1 095.1	1 304.6	1 456.7	1 458.4 p
Hungary	399.0 d	360.6 d	505.4 d	597.7 b d	707.9 d	688.0 d	807.6 d
Iceland	65.2	116.8	125.4	127.2	141.3	142.2	155.2
Ireland	543.6	942.7	1 025.9 e	1 105.9 p	1 178.6 e p	1 304.8 e p	936.6 b p
Israel	1 035.2 d	1 603.9 d	1 540.5 d	1 628.6 d	1 633.8 d	1 621.3 d	1 638.5 d e
Italy	5 509.9 b	7 989.4 e	8 129.6 e	8 445.8 e	8 979.5 e	8 919.7 e	9 557.6 e
Japan	17 250.4	19 741.3	20 015.6	19 886.8 b	20 139.7	20 084.5	21 009.1
Korea	3 040.0 d	7 382.2	7 658.0	8 247.3	8 607.5	9 972.8	10 927.7
Latvia	66.6	99.7	132.9	199.0	219.8	216.6	216.8 p
Lithuania	197.1	290.9	301.9	343.0	403.4	473.4	478.1
Luxembourg	7.5	159.3	173.0	171.9	191.7	187.3 e p	216.9 e p
Mexico	1 536.9	4 658.3	4 057.4 e	3 986.7 e	3 647.7 e	3 520.6 e	..
Netherlands	3 775.3	5 410.8	5 761.0	5 902.8	6 293.7	6 735.0	6 751.9 p
New Zealand	386.3	..	670.9	..	763.7 p	..	..
Norway	1 010.1	2 055.0	2 392.0	2 629.5	2 737.5	2 612.8	2 827.7
Poland	942.5	3 249.2	3 881.5	4 645.2	6 254.7	6 483.2	7 162.2 p
Portugal	640.1	1 869.3	1 910.1	2 018.0	2 166.7	2 091.2	2 121.7 p
Slovak Republic	90.1	353.0	357.8	346.6	377.9	422.4	437.5
Slovenia	113.3	152.4	157.7	187.4	211.4	225.2	243.6 p
Spain	3 846.5	5 678.1	6 037.9	6 245.7	6 755.6	6 762.2	7 326.2 p
Sweden	2 284.9	4 358.4 e	4 380.9	4 579.4 e	4 649.0 b	4 692.9	4 926.9
Switzerland	..	..	5 234.7	..	5 742.4	..	..
Türkiye	2 509.8	7 206.7	7 237.2	7 157.3	7 193.3	7 215.3	6 926.9
United Kingdom	7 885.7	11 192.2	11 895.8	20 320.9 b	20 597.0	20 228.0	..
United States	45 490.0 d	67 792.0 d	71 114.0 d	74 878.0 d	78 146.0 d	80 842.0 d	84 035.0 d p
EU27 (from 01/02/2020)	43 579.2 e	80 038.1 e	84 115.7 e	89 757.8 e	96 840.1 e	99 623.5 e	102 604.2 e
<b>OECD-Total</b>	<b>141 929.7 e</b>	<b>233 665.4 e</b>	<b>243 142.0 e</b>	<b>256 233.1 e</b>	<b>267 998.6 e</b>	<b>274 702.3 e</b>	<b>282 180.9 e</b>
Argentina	573.8	1 211.2	1 458.4	1 354.7	1 216.5	1 160.8	..
China	8 527.2	26 881.0	30 258.6	34 471.8	..	..	..
Romania	115.5	260.4	284.6	280.8	311.3	261.7	300.8 p
Russian Federation	1 047.3	3 552.1	3 810.9	4 054.0	4 854.8	4 722.5	..
Singapore	1 306.9	3 205.4	3 010.6	2 954.4	3 037.2	2 999.5	..
South Africa	768.4	1 893.0	2 024.3	2 020.4	2 116.6	..	..
Chinese Taipei	1 746.5	3 226.7	3 277.8	3 585.5	3 691.5	3 723.2	3 803.1

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 44. Higher education expenditure on R&D (HERD) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	0.62	0.61 e	0.62	0.64 e	0.61	..
Austria	0.59 e	0.69 b e	0.69	0.69 e	0.68	0.72 e	0.71 e
Belgium	0.40	0.53	0.53	0.53	0.53	0.57 e	0.49 p
Canada	0.67	0.68	0.67	0.68	0.68	0.72	0.64 p
Chile	..	0.16 b p	0.16	0.17 e	0.17 e	0.16 e	..
Colombia	0.08	0.08	0.08	0.09	0.08	0.06	..
Czech Republic	0.22	0.34	0.35	0.41	0.42	0.43	0.41 p
Denmark	0.59	1.00	0.97	1.00	1.00	1.03	0.96 p
Estonia	0.38	0.44	0.51	0.63	0.58	0.59	0.59 p
Finland	0.63	0.68	0.69	0.70	0.71	0.72	0.69
France	0.39	0.46	0.45	0.45	0.44	0.47	0.45
Germany	0.41	0.53 b	0.53	0.55	0.55	0.59	0.57 p
Greece	0.27	0.32	0.33	0.34	0.39	0.48	0.44 p
Hungary	0.23 d	0.13 d	0.18 d	0.19 b d	0.21 d	0.21 d	0.23 d
Iceland	0.59	0.65	0.66	0.63	0.65	0.71	0.71
Ireland	0.32	0.28	0.27 e	0.27 p	0.27 e p	0.28 e p	0.17 b p
Israel	0.58 d	0.49 d	0.45 d	0.46 d	0.44 d	0.44 d	0.40 d e
Italy	0.32 b	0.33 e	0.32 e	0.32 e	0.33 e	0.35 e	0.35 e
Japan	0.42	0.38	0.38	0.37 b	0.38	0.38	0.39
Korea	0.25 d	0.36	0.36	0.37	0.38	0.43	0.45
Latvia	0.21	0.19	0.24	0.33	0.35	0.35	0.33 p
Lithuania	0.4	0.3	0.3	0.3	0.4	0.4	0.4
Luxembourg	0.02	0.24	0.25	0.24	0.26	0.25 e p	0.26 e p
Mexico	0.11	0.20	0.16 e	0.16 e	0.14 e	0.15 e	..
Netherlands	0.61	0.61	0.61	0.59	0.60	0.65	0.61 p
New Zealand	0.36	..	0.33	..	0.33 p	..	..
Norway	0.46	0.66	0.70	0.70	0.73	0.75	0.64
Poland	0.18	0.30	0.34	0.38	0.47	0.48	0.50 p
Portugal	0.27	0.57	0.56	0.56	0.56	0.58	0.56 p
Slovak Republic	0.10	0.22	0.22	0.20	0.21	0.24	0.24
Slovenia	0.24	0.22	0.21	0.23	0.24	0.26	0.26 p
Spain	0.32	0.33	0.33	0.33	0.33	0.38	0.38 p
Sweden	0.74	0.87 e	0.84	0.84 e	0.80 b	0.81	0.79
Switzerland	..	..	0.91	..	0.92	..	..
Türkiye	0.31	0.34	0.32	0.31	0.31	0.31	0.27
United Kingdom	0.40	0.39	0.39	0.65 b	0.63	0.66	..
United States	0.35 d	0.36 d	0.37 d	0.36 d	0.37 d	0.38 d	0.36 d p
EU27 (from 01/02/2020)	0.37 e	0.44 e	0.44 e	0.45 e	0.46 e	0.48 e	0.47 e
<b>OECD-Total</b>	<b>0.38 e</b>	<b>0.42 e</b>	<b>0.42 e</b>	<b>0.42 e</b>	<b>0.42 e</b>	<b>0.44 e</b>	<b>0.42 e</b>
Argentina	0.11	0.14	0.14	0.13	0.12	0.12	..
China	0.13	0.14	0.15	0.16	..	..	..
Romania	0.06	0.05	0.05	0.05	0.05	0.04	0.04 p
Russian Federation	0.06	0.10	0.10	0.10	0.11	0.11	..
Singapore	0.52	0.64	0.56	0.52	0.52	0.54	..
South Africa	0.17	0.27	0.28	0.27	0.28	..	..
Chinese Taipei	0.27	0.29	0.29	0.30	0.29	0.28	0.26

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 45. Higher education expenditure on R&D (HERD) at 2015 prices and PPP**

Million 2015 USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	7 114.8	7 216.6 e	7 552.8	7 763.2 e	7 524.1	..
Austria	2 247.9 e	3 043.8 b e	3 082.6	3 193.8 e	3 190.6	3 128.6 e	3 258.3 e
Belgium	1 812.6	2 816.1	2 835.0	2 874.3	2 941.1	2 988.6 e	2 764.1 p
Canada	9 157.4	10 949.5	11 228.6	11 626.9	11 948.4	11 803.9	11 496.1 p
Chile	..	659.2 b p	684.2	755.0 e	736.1 e	660.4 e	..
Colombia	319.2	500.4	490.8	602.9	529.7	391.6	..
Czech Republic	626.7	1 251.9	1 338.3	1 623.3	1 722.1	1 662.8	1 625.3 p
Denmark	1 524.9	2 881.0	2 881.5	3 009.9	3 064.6	3 083.4	3 019.2 p
Estonia	126.3	174.8	211.9	273.0	259.5	263.6	285.3 p
Finland	1 401.8	1 639.8	1 710.9	1 737.9	1 797.5	1 766.7	1 758.3
France	9 577.1	12 546.1	12 756.1	12 863.6	12 852.1	12 583.1	12 876.5
Germany	13 798.2	21 087.7 b	21 594.5	22 538.3	22 996.7	23 517.4	23 563.7 p
Greece	991.6	923.7	949.9	1 020.3	1 178.5	1 315.8	1 304.2 p
Hungary	554.4 d	354.5 d	492.1 d	567.5 b d	649.6 d	612.4 d	720.1 d
Iceland	79.3	112.6	118.3	119.2	126.5	128.0	134.6
Ireland	747.0	918.1	988.4 e	1 051.2 p	1 100.2 e p	1 222.7 e p	870.6 b p
Israel	1 180.6 d	1 543.0 d	1 468.1 d	1 553.5 d	1 565.1 d	1 524.4 d	1 502.5 d e
Italy	7 420.4 b	7 491.8 e	7 453.3 e	7 565.0 e	7 682.4 e	7 410.1 e	7 892.2 e
Japan	20 762.9	20 048.3	20 261.4	19 950.4 b	20 092.4	19 549.7	20 427.5
Korea	3 374.4 d	7 249.6	7 475.3	7 848.9	8 276.0	9 233.7	10 062.6
Latvia	91.3	96.2	124.6	181.6	194.3	188.1	186.3 p
Lithuania	268.1	281.6	283.1	313.4	352.1	411.2	402.3
Luxembourg	11.3	155.7	164.9	160.5	175.0	166.2 e p	181.9 e p
Mexico	2 051.5	4 473.8	3 853.7 e	3 755.0 e	3 437.2 e	3 308.6 e	..
Netherlands	4 711.9	5 289.7	5 469.0	5 432.5	5 634.8	5 801.2	5 722.2 p
New Zealand	502.8	..	618.2	..	666.3 p	..	..
Norway	1 251.3	2 037.1	2 251.3	2 355.1	2 395.9	2 268.4	2 310.3
Poland	1 239.1	3 187.0	3 762.9	4 462.7	5 748.8	5 792.9	6 358.9 p
Portugal	834.3	1 795.2	1 820.7	1 874.5	1 934.9	1 825.5	1 859.6 p
Slovak Republic	113.4	363.2	373.3	361.0	377.9	414.5	430.2
Slovenia	138.4	146.5	147.5	171.0	183.5	191.3	207.6 p
Spain	4 939.3	5 471.7	5 638.3	5 769.3	5 968.1	5 982.7	6 383.9 p
Sweden	2 923.2	4 277.5 e	4 223.9	4 318.5 e	4 199.9 b	4 137.4	4 249.3
Switzerland	..	..	5 079.3	..	5 361.5	..	..
Türkiye	3 786.0	7 115.4	7 180.0	7 191.5	7 250.2	7 352.3	7 102.8
United Kingdom	9 796.5	10 923.2	11 339.3	19 126.0 b	18 757.0	17 547.0	..
United States	54 424.8 d	67 119.3 d	69 095.8 d	71 045.0 d	72 839.0 d	74 381.3 d	73 994.7 d p
EU27 (from 01/02/2020)	56 700.6 e	76 882.0 e	78 983.2 e	82 131.9 e	85 079.3 e	85 314.3 e	86 893.9 e
<b>OECD-Total</b>	<b>175 939.2 e</b>	<b>228 191.8 e</b>	<b>233 436.9 e</b>	<b>240 725.1 e</b>	<b>245 949.1 e</b>	<b>246 572.7 e</b>	<b>247 536.9 e</b>
Argentina	689.8	1 161.8	1 225.1	1 111.5	980.5	924.5	..
China	9 199.8	27 317.0	30 942.7	34 428.7	..	..	..
Romania	182.5	244.1	257.5	247.0	255.6	207.0	232.6 p
Russian Federation	1 562.3	3 546.1	3 601.2	3 543.2	4 165.6	3 970.9 e	..
Singapore	1 449.1	3 180.1	2 925.0	2 807.8	2 843.3	2 773.1	..
South Africa	892.1	1 867.0	1 979.0	1 929.8	1 995.3	..	..
Chinese Taipei	2 060.5	3 264.7	3 334.9	3 562.9	3 603.9	3 591.4	3 522.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 46. Percentage of Higher education expenditure on R&D (HERD) financed by the business sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	5.1	..	4.9	..	5.5	..
Austria	..	..	5.1	..	5.0	..	..
Belgium	10.9	12.1	11.7	11.1	11.7	..	..
Canada	8.4	7.8	7.8	7.9	8.0	7.2	7.2 p
Chile	..	2.8 b p	2.6	3.3 e	3.4 e	3.4 e	..
Colombia	7.6	4.8	9.7	10.1	7.1	8.5	..
Czech Republic	0.8	4.7	5.1	4.6	3.8	3.7	3.9 p
Denmark	2.4	2.6	2.6	2.6	2.4	2.5	..
Estonia	5.2	7.4	5.8	6.9	7.9	7.8	..
Finland	6.5	3.7	3.2	2.9	3.1	3.1	..
France	1.6	2.6	2.7 s	2.8	3.0	3.0	..
Germany	14.6 d	13.8 b d	13.3 d	13.5 d	13.6 d	12.9 d	..
Greece	8.9	7.3	8.4	8.5	7.9	6.5	7.6 p
Hungary	11.8 d	9.6 d	6.1 d	5.4 b d	2.6 d	2.7 d	..
Iceland	11.3	2.3	0.8	0.5	1.8	2.8	1.5 b
Ireland	2.7	3.2	3.2 e	3.6 p	3.9 e p	..	..
Israel	7.3 d	9.5 d	7.4 d	7.3 d	6.7 d	6.3 d	..
Italy	1.4 b	1.3 e	6.0 e	6.0 e	6.0 e	6.0 e	..
Japan	2.8	2.8	2.9	3.2 b	3.4	3.3	3.2
Korea	15.2 d	12.6	13.7	14.3	14.3	13.8	14.1
Latvia	15.4	5.6	5.9	4.2	4.6	6.4	..
Lithuania	3.8	12.2	6.8	6.4	5.7	5.4	..
Luxembourg	1.4	1.2	1.3	0.9	0.9	0.9 e p	..
Mexico	1.2 e	0.4	0.4 e	0.3 e	0.3 e	0.3 e	..
Netherlands	7.8	7.8	8.3	8.7	8.3	7.8	..
New Zealand	8.0	..	4.5	..	4.5 p	..	..
Norway	4.7	3.1	2.3	2.3 e	2.3	2.3 e	..
Poland	5.4	3.0	3.5	3.9	3.3	2.8	..
Portugal	1.2	1.8	1.9	2.0	2.1	2.2	..
Slovak Republic	0.7	1.9	2.1	0.7	0.8	0.6	..
Slovenia	9.0	10.6	8.7	8.5	8.6	7.1	..
Spain	6.9	5.1	5.2	5.5	5.6	5.2	..
Sweden	5.1	..	3.6	..	3.3 b	..	..
Switzerland	..	..	9.7	..	10.4	..	..
Türkiye	22.7 d	1.2	1.3	1.9	1.7	2.1	2.0
United Kingdom	4.6	4.5	4.4	9.2 b	9.0	8.8	..
United States	5.0 d	5.2 d	5.3 d	5.4 d	5.4 d	5.2 d	5.1 d p
EU27 (from 01/02/2020)	6.9 e	6.9 e	7.2 e	7.3 e	7.2 e	7.0 e	..
<b>OECD-Total</b>	<b>6.5 e</b>	<b>6.1 e</b>	<b>6.3 e</b>	<b>6.5 e</b>	<b>6.5 e</b>	<b>6.3 e</b>	..
Argentina	0.6	0.3	0.3	0.2	1.6	0.2	..
China	36.7	29.0	28.5	26.6	..	..	..
Romania	7.5	6.2	6.6	5.7	4.8	5.0	..
Russian Federation	29.3	27.7	28.2	29.1	32.2	29.7	..
Singapore	1.7	5.8	6.0	4.6	5.1	5.6	..
South Africa	11.6	7.8	5.2	3.5	3.7	..	..
Chinese Taipei	5.8	9.7	10.0	9.9	11.3	11.7	12.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 47. Higher education researchers in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	69 287	..	70 441	..	69 247	..
Austria	8 962 d e	13 363 d e	13 513 d	14 258 d e	14 669 d	14 750 d e	15 648 d e
Belgium	13 853	19 601	19 705	19 934	20 272	20 961 e	19 831 d p
Canada	43 400	59 240	60 140	61 070	63 450	..	..
Chile	..	4 357 d	4 520 d	4 862 d e	4 982 d e	5 114 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	7 762 b	10 511	10 875	12 001	12 663	13 331	13 964 p
Denmark	8 242	16 233	16 046	16 496	16 747 p	16 839 p	17 877 p
Estonia	1 905	2 426	2 452	2 718	2 442	2 364	2 417 p
Finland	12 879	11 987	12 731	12 824	13 411	13 257	12 672
France	66 290	81 565	82 396	82 633	83 772	84 811 e p	92 430
Germany	65 363	109 877 b	112 143	114 868	114 512	117 638	120 500 p
Greece	11 356 d	17 241 d	17 853 d	18 588 d	20 347 d	22 641 d	22 338 d p
Hungary	5 911	5 592	6 032	9 547 d	9 999 d	10 603 d	10 346
Iceland	585	1 151	927	..	..	..	1 072
Ireland	4 400	12 627	11 295 e	9 964	9 964 e	9 964 e	11 822 b p
Israel	..	9 524 d e	9 802 d e	9 981 d e	10 060 d e	9 466 d e	..
Italy	37 073 b d	50 816 d e	51 362 d e	51 989 d e	54 501 d e	54 956 d e	58 920 e
Japan	156 176 d	138 095 d	138 697 d	134 740 b d	135 509 d	136 190 d	137 303 d
Korea	27 416 d	40 759	38 813	40 736	41 448	44 895	43 773
Latvia	2 224 d	1 944 d	2 264 d	2 200 d	2 308 d	2 607 d	2 725 p
Lithuania	5 116.0	4 992.7	4 574.5	4 521.4	4 947.0	5 709.9	5 926.5
Luxembourg	157	972	1 048	1 085	1 182	1 175 e p	1 380 p
Mexico	16 691 e	17 008	16 746 e	16 414 e	16 886 e	17 335 e	..
Netherlands	17 928	22 244	22 788	23 029	23 806	25 222	25 300 p
New Zealand	7 481	..	13 000	..	16 000 p	..	..
Norway	7 512	11 795	12 538	13 051	13 836	13 235	14 293
Poland	40 449	44 414	56 397 d	57 049 d	59 947 d	57 532 d	59 458 p
Portugal	10 956	26 106	27 562	28 831	28 812	28 740	28 864 p
Slovak Republic	6 458 d	8 154 d	8 745 d	9 279 d	9 664 d	9 895 d	9 555
Slovenia	1 695	1 951	2 020 d	2 104 d	2 277 d	2 274 d	2 432 p
Spain	54 028	58 413 d	62 542 d	64 007 d	66 630 d	67 212 d	69 984 p
Sweden	15 125 b	19 726 e	17 501	16 676 e	19 217	18 571	17 484
Switzerland	..	..	22 724	..	24 024	..	..
Türkiye	25 434	40 996	42 916	44 240	46 055	46 540	49 649 e
United Kingdom	141 762 b e	167 519	170 971	171 527	172 489	..	..
United States	..	..	..	..	..	175 941	..
EU27 (from 01/02/2020)	409 884 e	557 373 e	577 397 e	589 648 e	607 399 e	616 969 e	637 432 e
<b>OECD-Total</b>	<b>1 187 409 e</b>	<b>1 414 325 e</b>	<b>1 442 985 e</b>	<b>1 460 362 e</b>	<b>1 478 166 e</b>	<b>1 473 569 e</b>	<b>..</b>
Argentina	14 200	22 781	20 720	20 933	22 075	22 061	..
China	221 908 d	307 923	327 891	352 836	..	..	..
Romania	5 386	6 314	6 413	5 832	5 773	6 375	6 078 p
Russian Federation	70 494	83 024	75 977	80 678	82 749	78 864	..
Singapore	8 187	17 468	17 165	16 606	17 620	16 848	..
South Africa	9 235	19 629	20 996	21 591	22 153	..	..
Chinese Taipei	23 180	29 099	28 810	28 767	28 793	28 996	29 023

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 48. Higher education researchers as a percentage of national total**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	31.5 d e	28.4 d e	28.4 d	28.4 d e	27.8 d	28.4 d e	28.4 d e
Belgium	41.8	36.1 e	36.5	34.7	33.4	32.7 e	26.0 d p
Canada	31.7	37.3	37.1	34.9	34.7	..	..
Chile	..	48.5 d	49.7 d	49.6 d e	51.5 d e	51.3 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	32.1 b	28.2	27.8	29.1	29.8	30.2	29.0 p
Denmark	29.2	36.2	36.5	37.6	37.5 p	37.8 p	39.7 p
Estonia	57.2	55.9	52.5	54.7	48.9	46.4	45.0 p
Finland	32.5	33.4	34.4	33.8	33.5	31.8	29.1
France	32.7	28.6	27.8	27.1	26.7	26.4 e p	27.2
Germany	24.0	27.5 b	26.7	26.5	25.4	26.1	26.2 p
Greece	58.0 d	58.6 d	51.0 d	50.7 d	52.1 d	52.7 d	50.4 d p
Hungary	37.2	21.7	21.2	25.4 d	25.4 d	25.2 d	23.9
Iceland	27.2	..	45.2	..	..	..	41.9
Ireland	38.0	51.9 e	46.2 e	43.7 e	42.3 e	41.6 e	..
Israel	..	..	..	..	..	..	..
Italy	44.9 b d	38.0 b d e	36.6 d e	34.1 d e	33.9 d e	35.0 d e	34.1 e
Japan	22.9 d	20.7 d	20.5 d	19.9 b d	19.9 d	19.7 d	19.5 d
Korea	15.2 d	11.3	10.1	10.0	9.6	10.0	9.3
Latvia	67.8 d	61.7 d	65.0 d	63.7 d	63.5 d	64.0 d	60.2 p
Lithuania	67.0	58.6	52.3	50.6	51.4	56.1	53.8
Luxembourg	7.1	35.1	35.7	37.9	37.8	40.0 e p	43.0 p
Mexico	38.0 e	43.7	42.8 e	41.9 e	40.4 e	38.6 e	..
Netherlands	37.5	25.4	25.0	24.1	24.4	24.7	23.9 p
New Zealand	57.6	..	54.2	..	57.1 p	..	..
Norway	35.4	37.0	37.3	38.0	38.5	36.4	37.0 p
Poland	65.1	50.4	49.2 d	48.4 d	49.6 d	46.2 d	43.8 p
Portugal	51.9	63.1	61.3	60.5	57.4	54.0	51.4 p
Slovak Republic	59.1 d	57.6 d	57.4 d	56.8 d	56.9 d	57.3 d	54.5
Slovenia	32.3	24.0	21.7 d	20.9 d	21.7 d	21.0 d	22.0 p
Spain	49.2	46.1 d	46.9 d	45.7 d	46.3 d	46.2 d	45.4 p
Sweden	27.5 b e	28.0 e	23.9	22.2 e	24.4	23.2	20.6
Switzerland	..	..	51.3	..	50.4	..	..
Türkiye	65.0	40.9	38.4	35.0	34.0	31.1	29.4 e
United Kingdom	57.0 b e	57.5 e	57.8	..	..	..	..
United States	..	..	..	..	..	11.8 e	..
EU27 (from 01/02/2020)	36.4 e	34.5 e	33.8 e	33.0 e	32.8 e	32.7 e	32.0 e
<b>OECD-Total</b>	<b>31.3 e</b>	<b>28.8 e</b>	<b>28.2 e</b>	<b>27.1 e</b>	<b>26.6 e</b>	<b>26.0 e</b>	<b>..</b>
Argentina	44.6	41.6	39.0	38.5	40.2	39.5	..
China	19.8 d	18.2	18.8	18.9	..	..	..
Romania	23.5	35.0	36.6	33.9	33.3	34.8	31.8 p
Russian Federation	15.2	19.4	18.5	19.9	20.7	19.9	..
Singapore	34.4	44.6	44.1	42.3	41.5	39.6	..
South Africa	53.4	71.0	71.1	74.2	78.1	..	..
Chinese Taipei	26.1	19.8	19.2	18.7	18.1	17.7	17.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 49. Higher education Total R&D personnel in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	79 008	..	81 717	..	81 090	..
Austria	12 353 d e	17 484 d e	17 680 d	18 655 d e	18 971 d	19 077 d e	20 238 d e
Belgium	17 767	24 953	25 060	25 363	25 872	26 030 e	24 984 d p
Canada	56 950	73 210	74 330	75 380	78 030	..	..
Chile	..	8 058 d	8 233 d	8 514 d e	8 990 d e	8 999 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	10 972 b	15 201	15 803	18 226	19 647	20 007	20 911 p
Denmark	11 561	21 969	21 751	21 891	22 185 p	22 307 p	22 899 p
Estonia	2 176	2 969	3 015	3 233	2 957	2 856	2 869 p
Finland	17 453	15 157	16 007	16 418	17 002	17 061	16 970
France	98 743	119 367	119 788	119 932	120 973	122 003 e p	135 871
Germany	94 522	141 661 b	143 753	147 160	147 316	151 692	155 600 p
Greece	17 401 d	20 404 d	21 986 d	23 431 d	25 240 d	27 613 d	27 617 d p
Hungary	8 194	7 476	8 442	12 994 d	14 111 d	14 703 d	14 303
Iceland	742	1 360	1 096	..	..	..	1 234
Ireland	5 220	15 178	13 211 e	11 243	11 243 e	11 243 e	13 073 b p
Israel	9 011 d	11 205 d e	11 532 d e	11 743 d e	11 836 d e	11 137 d e	..
Italy	66 976 b d	80 226 d e	80 358 d e	81 233 d e	83 776 d e	82 671 d e	87 480 e
Japan	209 734 d	210 683 d	212 212 d	210 100 b d	211 602 d	212 150 d	223 354 d
Korea	42 157 d	72 482	70 037	71 333	71 727	77 674	79 667
Latvia	2 856 d	3 147 d	3 448 d	3 553 d	3 721 d	4 063 d	4 069 p
Lithuania	6 699.0	5 895.3	5 386.6	5 318.9	5 876.0	6 605.8	6 912.9
Luxembourg	169	1 097	1 164	1 210	1 343	1 335 e p	1 573 p
Mexico	25 218 e	25 130	25 136 e	24 999 e	26 023 e	27 086 e	..
Netherlands	32 305	33 300	34 350	34 742	35 963	38 433	38 600 p
New Zealand	9 660	..	16 000	..	18 000 p	..	..
Norway	9 420	14 937	15 675	16 237	16 957	16 126	17 635
Poland	44 763	51 652	65 325 d	70 172 d	73 196 d	72 159 d	73 941 p
Portugal	11 680	28 265	30 078	31 451	31 556	31 505	31 146 p
Slovak Republic	7 146 d	8 623 d	9 056 d	9 620 d	9 996 d	10 234 d	9 875
Slovenia	2 099	2 321	2 395 d	2 659 d	2 888 d	2 911 d	3 109 p
Spain	66 996	75 191 d	79 286 d	80 318 d	83 048 d	84 325 d	88 227 p
Sweden	17 686 b	21 918 e	20 196	19 453 e	22 080	21 555	20 192
Switzerland	..	..	31 523	..	33 190	..	..
Türkiye	25 434 e	52 576 b	54 289	56 364	59 031	59 653	62 584 e
United Kingdom	152 634 b e	186 770	190 078	190 526	189 278	..	..
United States	..	..	..	..	..	440 035	..
EU27 (from 01/02/2020)	570 624 e	734 201 e	756 878 e	776 960 e	798 124 e	810 939 e	840 500 e
<b>OECD-Total</b>	<b>..</b>	<b>2 050 923 e</b>	<b>..</b>	<b>2 112 785 e</b>	<b>2 131 120 e</b>	<b>2 129 534 e</b>	<b>..</b>
Argentina	15 507	27 434	28 128	31 872	33 060	30 079	..
China	227 163 d	360 049	382 160	410 893	..	..	..
Romania	6 803	8 627	8 416	7 695	7 600	8 862	8 326 p
Russian Federation	97 672	110 379	101 628	107 756	116 732	109 662	..
Singapore	9 337	18 692	18 309	17 656	18 949	18 299	..
South Africa	10 611	22 061	23 415	24 457	25 109	..	..
Chinese Taipei	25 752	32 349	31 866	31 896	31 871	32 107	32 083

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 50. Government intramural expenditure on R&D (GOVERD) at current prices and PPP**

Million USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	2 261.0	2 253.0 e	2 264.5	2 286.7 e	2 488.4	..
Austria	355.9 e	1 016.3 b e	1 040.8	1 111.9 e	1 219.1	1 233.8 e	1 292.4 e
Belgium	520.6	1 339.0	1 436.5	1 574.6	1 780.6	1 763.3 e	1 888.7 p
Canada	2 238.7	1 927.8	2 096.0	2 242.8	2 191.6	2 584.5	2 379.6 p
Chile	..	203.3	211.0	222.7 e	188.2 e	178.3 e	..
Colombia	32.9	145.8	173.3	178.0	200.6	138.4	..
Czech Republic	596.5 b	1 156.9	1 254.1	1 358.0	1 480.4	1 559.6	1 593.1 p
Denmark	285.7	203.9	287.0	286.9	298.2	363.3	363.3 p
Estonia	23.3	58.5	66.9	77.6	86.5	90.2	94.5 p
Finland	534.0	548.8	610.3	626.6	647.8	642.3	663.8
France	7 024.1	8 089.8	8 144.9	8 539.0	9 194.7	8 776.0	9 412.0
Germany	9 014.2 d	16 902.4 d	18 104.6 d	19 264.5 d	20 627.7 d	21 500.0 d	23 148.0 d p
Greece	329.9	745.6	784.5	864.1	954.5	987.4	1 061.1 p
Hungary	444.3 d	434.0 d	477.5 d	511.4 b d	498.6 d	526.4 d	597.7 d
Iceland	69.8	17.9	16.6	16.8	16.1	16.7	17.2
Ireland	148.3	168.1	179.3	200.2	204.4	207.6	212.4 p
Israel	186.4 d	227.3 d	247.7 d	264.4 d	259.3 d	255.2 d	253.5 d
Italy	3 158.8	4 155.8	4 259.5	4 619.5	5 034.8	5 104.8	5 513.9
Japan	10 669.1	12 098.2	13 019.4	13 336.7	13 454.5	14 207.7	14 787.1
Korea	3 631.6 d	9 329.8	9 660.2	10 102.3	10 389.8	11 231.6	11 687.8
Latvia	30.7	72.4	74.3	86.5	75.8	81.2	89.8 p
Lithuania	90.1	195.0	239.0	212.3	226.1	201.4	214.5
Luxembourg	60.1 d	212.9 d	202.6 d	216.2 d	208.8 d	204.1 e p	244.6 e p
Mexico	1 238.8	2 438.1	2 114.2 e	2 069.2 e	1 880.6 e	1 816.2 e	..
Netherlands	1 355.4 d	1 160.4 d	1 159.6 d	1 250.1 d	1 302.4 d	1 359.6 d	1 407.5 d p
New Zealand	308.1	..	578.6	..	535.0	..	..
Norway	513.1	892.8	970.4	1 052.1	1 016.7	978.5	1 130.2
Poland	1 085.2	260.3 b	269.8	285.2	222.9	365.9	422.5 p
Portugal	264.3	219.7	246.2	257.4	274.8	287.4	291.2 p
Slovak Republic	130.8 d	273.0	301.7	303.0	299.4	318.1	318.4
Slovenia	163.7	189.1	194.1	213.1	247.5	253.2	266.7 p
Spain	2 258.7	3 817.0	3 955.1	3 980.7	4 319.9	4 430.3	4 647.8 p
Sweden	506.9 b	553.2 e	636.3	654.1 e	886.3 b v	891.5	944.3
Switzerland	..	..	155.3 d	..	186.0	..	..
Türkiye	531.0	1 884.2 d	2 065.4 d	2 180.1 d	1 633.3 d	1 717.2 d	1 632.0 d
United Kingdom	3 234.9	3 153.1	3 221.9	3 786.4	3 917.6	4 491.6	..
United States	40 378.0 d	52 508.0 d	54 129.0 d	60 218.0 d	64 801.0 d	66 641.0 d	66 828.0 d p
EU27 (from 01/02/2020)	28 755.3 e	42 423.2 e	44 671.0 e	47 230.5 e	51 008.2 e	52 125.8 e	55 754.4 e
<b>OECD-Total</b>	<b>93 228.1 e</b>	<b>128 937.4 e</b>	<b>134 166.4 e</b>	<b>144 435.0 e</b>	<b>152 291.7 e</b>	<b>157 859.0 e</b>	<b>162 830.8 e</b>
Argentina	882.1	2 324.7	2 706.5	2 106.1	1 845.6	1 828.5	..
China	18 787.5	61 685.9	64 055.0	70 612.0	81 390.1	..	..
Romania	288.6	765.5	865.7	877.1	969.5	954.3	985.4 p
Russian Federation	4 723.4	12 474.0	12 851.4	14 425.3	12 923.3	15 741.4	..
Singapore	522.3	1 167.6	1 139.6	1 192.9	1 267.1	1 523.9	..
South Africa	828.8	1 337.0	1 344.3	1 175.1	1 208.0	..	..
Chinese Taipei	3 218.7	4 389.7	4 286.1	4 304.6	4 656.1	4 581.0	4 850.5

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 51. Government intramural expenditure on R&D (GOVERD) as a percentage of GDP**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	0.19	0.18 e	0.17	0.17 e	0.17	..
Austria	0.12 e	0.22 b e	0.22	0.22 e	0.23	0.24 e	0.24 e
Belgium	0.15	0.24	0.25	0.26	0.28	0.28 e	0.28 p
Canada	0.19	0.11	0.12	0.12	0.12	0.14	0.12 p
Chile	..	0.05	0.05	0.05 e	0.04 e	0.04 e	..
Colombia	0.01	0.02	0.03	0.02	0.03	0.02	..
Czech Republic	0.26 b	0.30	0.30	0.31	0.31	0.34	0.33 p
Denmark	0.15	0.07	0.09	0.09	0.09	0.10	0.10 p
Estonia	0.10	0.14	0.15	0.16	0.17	0.17	0.16 p
Finland	0.32	0.22	0.23	0.23	0.23	0.22	0.22
France	0.36	0.28	0.27	0.27	0.27	0.27	0.27
Germany	0.34 d	0.41 d	0.41 d	0.42 d	0.43 d	0.46 d	0.47 d p
Greece	0.12	0.25	0.26	0.27	0.29	0.32	0.32 p
Hungary	0.26 d	0.16 d	0.17 d	0.16 b d	0.15 d	0.16 d	0.17 d
Iceland	0.63	0.10	0.09	0.08	0.07	0.08	0.08
Ireland	0.09	0.05	0.05	0.05	0.05	0.04	0.04 p
Israel	0.10 d	0.07 d	0.07 d	0.07 d	0.07 d	0.07 d	0.06 d
Italy	0.18	0.17	0.17	0.18	0.18	0.20	0.20
Japan	0.26	0.23	0.25	0.25	0.25	0.27	0.28
Korea	0.30 d	0.46	0.46	0.45	0.46	0.48	0.48
Latvia	0.10	0.14	0.13	0.15	0.12	0.13	0.14 p
Lithuania	0.2	0.2	0.3	0.2	0.2	0.2	0.2
Luxembourg	0.19 d	0.32 d	0.30 d	0.31 d	0.28 d	0.27 e p	0.29 e p
Mexico	0.09	0.10	0.09 e	0.08 e	0.07 e	0.08 e	..
Netherlands	0.22 d	0.13 d	0.12 d	0.13 d	0.12 d	0.13 d	0.13 d p
New Zealand	0.29	..	0.28	..	0.23	..	..
Norway	0.23	0.29	0.28	0.28	0.27	0.28	0.26
Poland	0.20	0.02 b	0.02	0.02	0.02	0.03	0.03 p
Portugal	0.11	0.07	0.07	0.07	0.07	0.08	0.08 p
Slovak Republic	0.15 d	0.17	0.18	0.18	0.16	0.18	0.17
Slovenia	0.34	0.27	0.26	0.26	0.28	0.29	0.29 p
Spain	0.19	0.22	0.21	0.21	0.21	0.25	0.24 p
Sweden	0.16 b	0.11 e	0.12	0.12 e	0.15 b v	0.15	0.15
Switzerland	..	..	0.03 d	..	0.03	..	..
Türkiye	0.07	0.09 d	0.09 d	0.09 d	0.07 d	0.07 d	0.06 d
United Kingdom	0.16	0.11	0.11	0.12	0.12	0.15	..
United States	0.31 d	0.28 d	0.28 d	0.29 d	0.30 d	0.32 d	0.29 d p
EU27 (from 01/02/2020)	0.25 e	0.23 e	0.23 e	0.24 e	0.24 e	0.25 e	0.25 e
<b>OECD-Total</b>	<b>0.25 e</b>	<b>0.23 e</b>	<b>0.23 e</b>	<b>0.24 e</b>	<b>0.24 e</b>	<b>0.25 e</b>	<b>0.24 e</b>
Argentina	0.17	0.26	0.26	0.20	0.18	0.19	..
China	0.28	0.33	0.32	0.32	0.35	..	..
Romania	0.14	0.16	0.16	0.15	0.15	0.15	0.14 p
Russian Federation	0.26	0.35	0.34	0.34	0.29	0.36	..
Singapore	0.21	0.23	0.21	0.21	0.22	0.27	..
South Africa	0.18	0.19	0.19	0.16	0.16	..	..
Chinese Taipei	0.49	0.39	0.37	0.36	0.37	0.35	0.33

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 52. Government intramural expenditure on R&D (GOVERD) at 2015 prices and PPP**

Million 2015 USD

	2005	2016	2017	2018	2019	2020	2021
Australia	..	2 144.6	2 138.3 e	2 068.6	2 066.3 e	2 149.0	..
Austria	473.5 e	970.6 b e	981.6	1 017.0 e	1 074.7	1 056.6 e	1 100.4 e
Belgium	679.3	1 282.6	1 341.9	1 431.3	1 549.4	1 478.6 e	1 552.4 p
Canada	2 614.3	1 844.2	1 986.2	2 082.9	2 044.9	2 362.1	2 105.0 p
Chile	..	197.4	195.7	202.6 e	169.2 e	153.4 e	..
Colombia	37.4	139.6	161.5	157.8	172.1	114.1	..
Czech Republic	768.8 b	1 111.9	1 175.4	1 235.6	1 286.3	1 319.0	1 333.6 p
Denmark	399.4	197.1	266.1	260.0	262.2	307.4	301.1 p
Estonia	34.4	56.2	62.9	70.1	75.4	77.2	79.1 p
Finland	703.5	532.1	575.4	572.6	572.7	548.6	557.4
France	9 038.8	7 762.6	7 675.9	7 824.0	7 879.8	7 257.3	7 771.9
Germany	11 595.9 d	16 133.9 d	16 848.5 d	17 354.8 d	18 018.3 d	18 365.6 d	19 488.2 d p
Greece	423.5	724.7	742.9	805.1	862.3	891.8	948.9 p
Hungary	617.2 d	426.6 d	464.9 d	485.6 b d	457.5 d	468.6 d	532.9 d
Iceland	84.9	17.2	15.7	15.7	14.4	15.0	14.9
Ireland	203.7	163.7	172.7	190.3	190.8	194.6	197.4 p
Israel	212.6 d	218.7 d	236.1 d	252.2 d	248.4 d	240.0 d	232.5 d
Italy	4 254.1	3 897.0	3 905.1	4 137.7	4 307.5	4 240.9	4 553.1
Japan	12 841.6	12 286.3	13 179.3	13 379.3	13 422.9	13 829.4	14 377.7
Korea	4 031.0 d	9 162.3	9 429.7	9 614.3	9 989.7	10 399.2	10 762.6
Latvia	42.1	69.9	69.7	79.0	67.0	70.5	77.1 p
Lithuania	122.6	188.8	224.1	194.0	197.3	174.9	180.5
Luxembourg	90.5 d	208.1 d	193.1 d	201.9 d	190.6 d	181.2 e p	205.1 e p
Mexico	1 653.6	2 341.6	2 008.0 e	1 948.9 e	1 772.0 e	1 706.8 e	..
Netherlands	1 691.7 d	1 134.4 d	1 100.8 d	1 150.5 d	1 166.1 d	1 171.1 d	1 192.9 d p
New Zealand	401.1	..	533.2	..	466.8	..	..
Norway	635.6	885.0	913.3	942.3	889.9	849.6	923.4
Poland	1 426.7	255.3 b	261.5	274.0	204.9	326.9	375.1 p
Portugal	344.5	211.0	234.7	239.1	245.4	250.9	255.2 p
Slovak Republic	164.7 d	281.0	314.8	315.6	299.3	312.2	313.1
Slovenia	199.9	181.7	181.7	194.4	214.8	215.1	227.2 p
Spain	2 900.3	3 678.3	3 693.3	3 677.1	3 816.3	3 919.6	4 050.0 p
Sweden	648.5 b	543.0 e	613.5	616.8 e	800.6 b v	786.0	814.4
Switzerland	..	..	150.7 d	..	173.7	..	..
Türkiye	801.0	1 860.3 d	2 049.0 d	2 190.5 d	1 646.2 d	1 749.8 d	1 673.5 d
United Kingdom	4 018.8	3 077.3	3 071.2	3 563.8	3 567.6	3 896.3	..
United States	48 308.7 d	51 987.0 d	52 592.8 d	57 135.5 d	60 400.3 d	61 315.2 d	58 843.6 d p
EU27 (from 01/02/2020)	37 423.3 e	40 618.6 e	41 770.7 e	42 971.0 e	44 479.3 e	44 374.9 e	46 928.4 e
<b>OECD-Total</b>	<b>114 624.7 e</b>	<b>126 246.6 e</b>	<b>129 136.5 e</b>	<b>135 915.0 e</b>	<b>140 121.6 e</b>	<b>142 383.2 e</b>	<b>143 128.9 e</b>
Argentina	1 060.3	2 229.9	2 273.5	1 727.9	1 487.6	1 456.3	..
China	20 269.5	62 686.4	65 503.2	70 523.7	79 980.1	..	..
Romania	456.1	717.6	783.3	771.5	796.2	754.6	761.9 p
Russian Federation	7 046.4	12 453.2	12 144.1	12 607.5	11 088.7	13 236.1 e	..
Singapore	579.1	1 158.4	1 107.2	1 133.7	1 186.2	1 408.9	..
South Africa	962.2	1 318.6	1 314.2	1 122.4	1 138.7	..	..
Chinese Taipei	3 797.4	4 441.4	4 360.7	4 277.4	4 545.6	4 418.8	4 492.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 53. Percentage of Government intramural expenditure on R&D (GOVERD) financed by the business sector**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	10.3	..	10.0	..	12.3	..
Austria	..	..	8.7	..	9.0	..	..
Belgium	9.2	5.8	5.4	6.7	6.5	..	..
Canada	3.8	0.9	0.9	1.0	1.3	0.5	0.6 p
Chile	..	1.8	2.0	1.8 e	1.8 e	2.1 e	..
Colombia	0.0	0.3	0.2	0.0	0.0	0.0	..
Czech Republic	9.4 b	4.0	3.6	3.9	3.6	2.6	2.5 p
Denmark	2.1	2.1	3.9	3.8	2.7	3.4	..
Estonia	0.0	2.9	1.8	1.7	2.1	2.2	..
Finland	12.4	9.1	7.4	7.8	7.4	6.1	..
France	7.4	8.1	7.9 s	8.0	6.9	7.6	..
Germany	9.9 d	11.2 d	10.1 d	9.9 d	9.7 d	9.8 d	..
Greece	1.3	3.2	5.6	3.3	3.4	3.2	4.4 p
Hungary	10.3 d	6.0 d	5.2 d	6.6 b d	3.4 d	1.6 d	..
Iceland	7.4	12.2	3.8	21.7	4.9	22.1	3.5
Ireland	4.1	0.9	3.9	2.9	2.7	..	..
Israel	7.7 d	2.2 d	2.1 d	2.1 d	1.9 d	1.6 d	..
Italy	2.4	3.8	4.3	3.8	3.9	3.8	..
Japan	0.7	2.4	2.8	2.7	2.5	2.3	2.8
Korea	4.3 d	3.0	3.4	3.0	3.0	3.4	2.4
Latvia	15.6	9.7	9.7	10.6	11.7	11.2	..
Lithuania	6.6	13.5	11.9	10.9	10.0	11.6	..
Luxembourg	3.9 d	1.1 d	2.1 d	3.2 d	4.2 d	4.2 e p	..
Mexico	1.2 e	3.1	3.2 e	2.9 e	3.1 e	3.0 e	..
Netherlands	14.6 d	7.8 d	8.6 d	9.2 d	8.3 d	8.5 d	..
New Zealand	19.0	..	17.3	..	26.0	..	..
Norway	10.6	8.0	7.5	7.0	6.8	7.6	..
Poland	14.3	5.3 b	4.8	3.9	4.4	3.7	..
Portugal	2.0	5.9	5.0	5.6	2.8	4.1	..
Slovak Republic	8.5 d	12.0	8.8	4.1	3.7	3.8	..
Slovenia	12.1	6.8	.. c	.. c	5.9	6.2	..
Spain	7.3	5.6	5.9	6.9	7.8	8.0	..
Sweden	1.3 b	..	6.8	..	2.9 b v	..	..
Switzerland	..	..	3.9 d	..	2.9	..	..
Türkiye	1.5	2.1 d	1.9 d	1.7 d	2.7 d	4.0 d	4.3 d
United Kingdom	9.9	1.8	1.6	2.7	3.0	2.1	..
United States	0.3 d	0.4 d	0.4 d	0.4 d	0.3 d	0.3 d	0.3 d p
EU27 (from 01/02/2020)	8.1 e	8.3 e	7.9 e	7.8 e	7.5 e	7.7 e	..
<b>OECD-Total</b>	<b>3.7 e</b>	<b>3.7 e</b>	<b>3.6 e</b>	<b>3.5 e</b>	<b>3.4 e</b>	<b>3.5 e</b>	..
Argentina	0.2	0.5	0.2	0.2	0.2	0.2	..
China	4.9	4.7	4.6	4.4	4.6	..	..
Romania	16.1	18.0	13.3	12.0	12.2	14.8	..
Russian Federation	11.4	9.1	9.7	9.6	9.4	8.9	..
Singapore	2.3	3.5	3.1	3.0	3.3	2.9	..
South Africa	7.9	5.9	4.1	2.8	2.9	..	..
Chinese Taipei	3.0	2.6	3.4	3.2	2.8	3.0	3.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 54. Government researchers in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	7 483	..	7 570	..	8 239	..
Austria	1 232 d e	3 624 d e	3 665 d	3 867 d e	3 817 d	3 848 d e	4 083 d e
Belgium	2 274	4 290	4 486	5 283	5 490	5 991 e	6 324 d p
Canada	8 360	7 400	7 940	7 770	8 270	..	..
Chile	..	1 296 d	1 163 d	1 385 d e	1 224 d e	1 359 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	6 564 b	7 500	7 908	7 879	7 968	8 169	8 326 p
Denmark	2 105	1 392	1 635	1 587	1 577 p	1 586 p	1 646 p
Estonia	474	504	549	489	524	542	537 p
Finland	4 374	3 209	3 318	3 236	3 260	3 338	3 425
France	25 889 d	28 890	28 821	29 207	29 276	29 639 e p	32 009
Germany	39 911	53 971 d	54 715 d	57 183 d	59 221 d	60 988 d	62 700 d p
Greece	2 076 d	6 263 d	7 184 d	7 768 d	8 151 d	8 385 d	8 537 d p
Hungary	4 959	4 965	4 867	6 592 d	6 495 d	6 848 d	6 717
Iceland	501	143	247	..	..	..	130
Ireland	419	504	580	652	635	641	698 p
Israel	..	..	..	..	..	..	..
Italy	14 454 d	21 711 d	22 118 d	22 694 d	23 276 d	23 429 d	24 609
Japan	34 035 d	30 238 d	30 610 d	30 585 d	30 532 d	30 152 d	30 436 d
Korea	12 791 d	27 170	27 185	27 364	28 686	27 891	27 989
Latvia	589 d	626 d	571 d	572 d	566 d	619 d	646 p
Lithuania	1 805.0	1 576.6	1 612.6	1 584.3	1 536.0	1 543.0	1 691.0
Luxembourg	374	601	612	644	662	657 e p	815 p
Mexico	6 589 e	6 670	6 450 e	6 189 e	6 034 e	5 849 e	..
Netherlands	7 028 d	5 668 d	5 563 d	5 845 d	6 083 d	6 285 d	6 356 d p
New Zealand	1 800	..	1 900	..	1 900	..	..
Norway	3 449 d	4 788	4 752	4 607	4 522	4 556	4 614
Poland	12 175	2 369 b	3 392 d	3 110 d	2 220 d	3 178 d	3 547 p
Portugal	3 338	1 340	1 477	1 558	1 600	1 651	1 786 p
Slovak Republic	2 503 d	3 087 d	3 078 d	3 088 d	3 090 d	3 130 d	3 197
Slovenia	1 591	1 667	1 502 d	1 661 d	1 778 d	1 806 d	1 895 p
Spain	20 446	20 663 d	20 844 d	21 422 d	22 147 d	22 527 d	23 418 p
Sweden	2 929 b d e	3 362 e	3 788	3 700 e	3 914	3 980	4 011
Switzerland	..	..	455 d	..	645 d	..	..
Türkiye	4 249	6 700 d	6 672 d	6 701 d	5 754 d	5 986 d	6 268 d
United Kingdom	9 311	7 047	6 876	6 882	7 356	7 130	..
United States	..	..	..	..	..	57 477 d l	..
EU27 (from 01/02/2020)	170 209 e	187 963 e	192 219 e	199 463 e	203 406 e	209 085 e	216 893 e
<b>OECD-Total</b>	<b>294 427 e</b>	<b>325 523 e</b>	<b>330 870 e</b>	<b>342 138 e</b>	<b>349 820 e</b>	<b>356 167 e</b>	<b>361 452 e</b>
Argentina	13 285	27 168	26 975	26 724	26 504	27 548	..
China	200 377 d	336 106	356 805	370 116	390 179	..	..
Romania	7 082	6 755	6 526	6 597	6 801	6 781	6 508 p
Russian Federation	154 827	145 956	139 479	144 548	124 183	131 003	..
Singapore	1 364	2 407	2 423	2 498	2 604	2 673	..
South Africa	1 974	2 910	2 691	2 618	2 647	..	..
Chinese Taipei	13 789	14 797	15 044	15 688	16 824	16 144	15 598

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 55. Government researchers as a percentage of national total**

Percentage

	2005	2016	2017	2018	2019	2020	2021
Australia	..	..	..	..	..	..	..
Austria	4.3 d e	7.7 d e	7.7 d	7.7 d e	7.2 d	7.4 d e	7.4 d e
Belgium	6.9	7.9 e	8.3	9.2	9.1	9.4 e	8.3 d p
Canada	6.1	4.7	4.9	4.4	4.5	..	..
Chile	..	14.4 d	12.8 d	14.1 d e	12.7 d e	13.6 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	27.2 b	20.1	20.2	19.1	18.7	18.5	17.3 p
Denmark	7.5	3.1	3.7	3.6	3.5 p	3.6 p	3.7 p
Estonia	14.2	11.6	11.7	9.8	10.5	10.6	10.0 p
Finland	11.1	8.9	9.0	8.5	8.2	8.0	7.9
France	12.8 d	10.1	9.7	9.6	9.3	9.2 e p	9.4
Germany	14.7	13.5 d	13.0 d	13.2 d	13.1 d	13.5 d	13.6 d p
Greece	10.6 d	21.3 d	20.5 d	21.2 d	20.9 d	19.5 d	19.3 d p
Hungary	31.2	19.2	17.1	17.5 d	16.5 d	16.3 d	15.5
Iceland	23.3	..	12.0	..	..	..	5.1
Ireland	3.6	2.1 e	2.4 e	2.9 e	2.7	2.7 e	..
Israel	..	..	..	..	..	..	..
Italy	17.5 d	16.2 b d	15.8 d	14.9 d	14.5 d	14.9 d	14.2
Japan	5.0 d	4.5 d	4.5 d	4.5 b d	4.5 d	4.4 d	4.3 d
Korea	7.1 d	7.5	7.1	6.7	6.7	6.2	5.9
Latvia	17.9 d	19.9 d	16.4 d	16.6 d	15.6 d	15.2 d	14.3 p
Lithuania	23.6	18.5	18.4	17.7	16.0	15.2	15.3
Luxembourg	16.8	21.7	20.8	22.5	21.2	22.4 e p	25.4 p
Mexico	15.0 e	17.2	16.5 e	15.8 e	14.5 e	13.0 e	..
Netherlands	14.7 d	6.5 d	6.1 d	6.1 d	6.2 d	6.2 d	6.0 d p
New Zealand	13.9	..	7.9	..	6.8	..	..
Norway	16.3 d	15.0	14.1	13.4	12.6	12.5	11.9 p
Poland	19.6	2.7 b	3.0 d	2.6 d	1.8 d	2.6 d	2.6 p
Portugal	15.8	3.2	3.3	3.3	3.2	3.1	3.2 p
Slovak Republic	22.9 d	21.8 d	20.2 d	18.9 d	18.2 d	18.1 d	18.2
Slovenia	30.3	20.5	16.1 d	16.5 d	16.9 d	16.7 d	17.1 p
Spain	18.6	16.3 d	15.6 d	15.3 d	15.4 d	15.5 d	15.2 p
Sweden	5.3 b d e	4.8 e	5.2	4.9 e	5.0	5.0	4.7
Switzerland	..	..	1.0 d	..	1.4 d	..	..
Türkiye	10.9	6.7 d	6.0 d	5.3 d	4.2 d	4.0 d	3.7 d
United Kingdom	3.7 b e	2.4 e	2.3	..	..	..	..
United States	..	..	..	..	..	3.8 d e l	..
EU27 (from 01/02/2020)	15.1 e	11.6 e	11.2 e	11.2 e	11.0 e	11.1 e	10.9 e
<b>OECD-Total</b>	<b>7.8 e</b>	<b>6.6 e</b>	<b>6.5 e</b>	<b>6.3 e</b>	<b>6.3 e</b>	<b>6.3 e</b>	..
Argentina	41.7	49.6	50.7	49.2	48.3	49.3	..
China	17.9 d	19.9	20.5	19.8	..	..	..
Romania	30.8	37.4	37.3	38.3	39.2	37.0	34.1 p
Russian Federation	33.3	34.0	34.0	35.6	31.0	33.0	..
Singapore	5.7	6.1	6.2	6.4	6.1	6.3	..
South Africa	11.4	10.5	9.1	9.0	9.3	..	..
Chinese Taipei	15.5	10.1	10.0	10.2	10.6	9.9	9.3

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database



**Table 56. Government Total R&D personnel in full-time equivalent**

FTE

	2005	2016	2017	2018	2019	2020	2021
Australia	..	14 773	..	14 521	..	15 047	..
Austria	2 318 d e	5 208 d e	5 266 d	5 557 d e	5 472 d	5 517 d e	5 853 d e
Belgium	3 589	6 653	6 946	7 530	7 770	8 214 e	8 702 d p
Canada	17 860	14 300	15 140	15 770	16 630	..	..
Chile	..	2 223 d	2 295 d	2 415 d e	1 952 d e	2 043 d e	..
Colombia	..	..	..	..	..	..	..
Czech Republic	11 054 b	13 099	13 689	14 163	14 530	14 438	14 446 p
Denmark	3 240	1 720	2 185	2 212	2 187 p	2 199 p	2 192 p
Estonia	696	841	847	680	705	747	693 p
Finland	7 422	4 039	4 240	4 217	4 177	4 367	4 488
France	49 645 d	49 409	49 195	49 261	49 378	49 799 e p	53 100
Germany	76 254 d	103 206 d	106 025 d	109 487 d	112 592 d	114 695 d	116 900 d p
Greece	4 345 d	11 750 d	12 074 d	13 350 d	13 896 d	14 154 d	14 814 d p
Hungary	7 652	7 456	7 271	10 633 d	9 708 d	9 984 d	9 733
Iceland	849	185	277	..	..	..	171
Ireland	1 132	993	1 051	1 196	1 194	1 192	1 262 p
Israel	..	..	..	..	..	..	..
Italy	32 684 d	38 490 d	38 756 d	39 495 d	39 973 d	40 898 d	41 178
Japan	62 975 d	61 615 d	62 046 d	62 470 d	61 717 d	62 089 d	64 476 d
Korea	16 847 d	38 119	37 578	38 738	40 364	39 919	40 124
Latvia	1 256 d	1 077 d	974 d	1 032 d	1 028 d	1 115 d	1 151 p
Lithuania	3 113.0	2 398.5	2 407.5	2 332.9	2 309.0	2 269.6	2 325.8
Luxembourg	560 d	1 072 d	1 129 d	1 172 d	1 206	1 198 e p	1 503 p
Mexico	14 837 e	13 183	12 674 e	12 091 e	11 494 e	10 813 e	..
Netherlands	12 706 d	8 568 d	8 553 d	9 326 d	9 336 d	9 635 d	9 651 d p
New Zealand	3 100	..	3 500	..	3 600	..	..
Norway	5 147	6 810	6 793	6 598	6 612	6 680	6 880
Poland	17 877	3 733 b	4 596 d	4 377 d	3 235 d	4 391 d	4 887 p
Portugal	4 533	2 098	2 212	2 283	2 315	2 571	2 712 p
Slovak Republic	3 717 d	4 414 d	4 213 d	4 060 d	4 079 d	4 127 d	4 211
Slovenia	2 517	2 501	2 323 d	2 497 d	2 664 d	2 691 d	2 786 p
Spain	32 077	39 972 d	40 283 d	40 332 d	41 372 d	42 160 d	44 147 p
Sweden	3 444 b e	4 269 e	4 894	4 918 e	5 344	5 498	5 591
Switzerland	..	..	875 d	..	1 041 d	..	..
Türkiye	8 825	11 799 d	11 345 d	11 379 d	8 886 d	9 439 d	9 658 d
United Kingdom	20 415	14 531	14 439	14 644	15 473	15 558	..
United States	..	..	..	..	..	..	..
EU27 (from 01/02/2020)	300 979 e	331 241 e	337 094 e	347 625 e	352 223 e	359 749 e	369 780 e
<b>OECD-Total</b>	<b>..</b>	<b>539 145 e</b>	<b>545 272 e</b>	<b>561 963 e</b>	<b>568 382 e</b>	<b>578 946 e</b>	<b>587 728 e</b>
Argentina	21 688	40 248	38 245	37 304	36 774	38 427	..
China	254 506 d	505 927	531 629	545 771	566 858	..	..
Romania	10 055	12 663	12 500	11 986	12 220	12 218	11 994 p
Russian Federation	296 428	287 129	283 620	289 612	244 022	265 699	..
Singapore	2 173	4 075	4 009	4 067	4 367	4 565	..
South Africa	5 586	6 453	6 295	5 941	5 736	..	..
Chinese Taipei	25 673	25 031	25 460	26 411	28 612	27 928	27 374

 Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 57. Total GBARD (Government budget allocations for R&D) at current prices and PPP**

Million USD

	2005	2017	2018	2019	2020	2021	2022
Australia	3 729.1 d	5 266.7 d	5 121.1 d	5 157.4 d	6 393.2 d p	6 157.3 d p	..
Austria	1 836.6 d	3 728.7 d	3 806.3 d	4 017.5 d	4 404.0 d	4 322.0 d	5 235.6 e p
Belgium	2 004.6	3 787.7	3 834.7	4 437.0	4 657.8	4 973.0	..
Canada	6 777.1 d	9 126.4 d	9 021.0 d	9 276.6 d	10 182.6 d	..	..
Chile	..	976.5	1 045.4	1 017.9	..	..	..
Colombia	171.2	618.4	559.7	553.3	491.4	..	..
Czech Republic	1 129.0	2 467.1	2 698.3	2 917.7	3 056.4	3 004.4	3 023.7 e p
Denmark	1 329.3	2 829.1 e	2 954.6 e	3 112.0 p	3 439.8 e	3 492.6 e	3 484.8 e p
Estonia	89.9 e	267.6	338.5	327.0	357.3	396.9	..
Finland	1 648.0	2 183.6	2 285.2	2 396.0	2 778.0	2 703.6	..
France	18 220.2	19 150.4	20 577.9	22 591.2	23 941.6	24 566.9 e	..
Germany	19 732.0	40 496.1	43 184.5	46 680.2	51 265.4	54 926.8	59 293.6 e p
Greece	895.8	1 538.4	1 979.3	2 347.3	2 689.1	2 840.9	..
Hungary	696.1	1 001.3	930.7	917.1	1 764.2	1 608.7	..
Iceland	94.0	180.7	193.0	197.6	..	259.6	..
Ireland	710.7	930.6	966.5	995.5	1 088.7	1 198.1	..
Israel	1 044.9 d	2 062.3 d	2 173.3 d	2 236.9 d	2 458.8 d	2 319.6 d	..
Italy	11 199.3	12 743.8	13 224.4	14 975.7	17 012.2	18 025.6	..
Japan	27 617.8 d	42 399.7 b d p	45 814.1 d p	54 996.0 d p	89 617.5 d p	79 944.5 d p	98 423.6 d e
Korea	9 886.5 b d	22 348.5	23 100.9	24 349.1	28 958.3	32 090.5	36 521.5 e p
Latvia	57.4	123.8	130.4	141.7	164.0	165.7	..
Lithuania	169.8	298.7	299.2	347.9 p	367.9	381.8	..
Luxembourg	81.5	410.3	420.8	457.0	434.5	496.3	..
Mexico	2 963.4	5 669.5	5 520.0	4 993.0	4 899.2	5 039.0	5 609.3 e p
Netherlands	4 391.9	6 338.9	7 107.7	7 237.6	7 942.1	8 890.5	10 210.4 e p
New Zealand	..	1 054.0	..	..	..	..	..
Norway	1 535.9	3 477.9	3 651.1	3 796.1	3 984.7	4 038.5	4 287.6 e
Poland	1 548.8	4 122.7	3 462.0	5 908.2 b	5 831.7	6 591.3	..
Portugal	1 045.6	1 270.4	1 303.7	1 337.3	1 330.0	1 371.9	..
Slovak Republic	244.6	593.6	623.9	695.8	738.4	763.3	..
Slovenia	273.3	299.1	337.7	398.0	445.0	469.3	..
Spain	6 440.7	9 505.6	9 922.0	10 575.7	11 205.6	11 966.8	..
Sweden	2 508.0	4 034.1	4 084.4	4 250.1	4 437.1	4 893.8	..
Switzerland	..	5 760.7 b	5 668.7	6 018.5	6 396.5	6 661.2	..
Türkiye	..	7 738.7	7 977.7	8 006.2	6 621.3	7 209.5	5 223.1 e p
United Kingdom	12 116.1	16 000.0	17 184.5	17 920.1	20 402.8	..	..
United States	111 332.0	127 306.0	144 459.0	149 971.0	169 901.0	161 885.0	169 938.0
EU27 (from 01/02/2020)	77 493.5 e	120 369.8 e	126 823.6 e	139 839.5 e	152 114.5 e	160 834.7 e	..
<b>OECD-Total</b>	<b>258 613.7 e</b>	<b>368 107.6 e</b>	<b>397 014.0 e</b>	<b>426 611.9 e</b>	<b>501 812.8 e</b>	<b>498 503.2 e</b>	..
Argentina	1 190.8 d	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	448.5	997.8	983.4	1 223.6	1 155.9	1 130.7	..
Russian Federation	6 038.6 b	15 664.0	17 132.1	19 693.7	22 439.3	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	4 884.0	7 817.0	7 643.1	8 115.7	8 190.8	8 369.6	9 057.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 58. Defence Budget R&D**  
As a percentage of total GBARD (Government budget allocations for R&D)

Percentage

	2005	2017	2018	2019	2020	2021	2022
Australia	6.9 d	7.4 d	7.2 d	6.2 d	6.2 d p	6.4 d p	..
Austria	0.0 d	0.2 d	0.2 d	0.2 d	0.1 d	0.2 d	0.2 p
Belgium	0.3	0.1	0.1	0.1	0.7	0.8	..
Canada	4.1 d	..	..	..	..	..	..
Chile	..	0.0	0.0	0.0	..	..	..
Colombia	1.3	1.7	1.9	0.9	0.9	..	..
Czech Republic	2.5	1.3	1.2	1.1	1.0	0.3	0.7 p
Denmark	0.7	0.3 e	0.3 e	0.3 e p	0.3 e	0.4 e	0.4 e p
Estonia	1.0 e	1.9	3.4	1.7	2.4	2.2	..
Finland	3.3	2.2	2.4	2.5	2.0	2.1	..
France	20.8	8.0 e	6.7 e	7.5 e	8.6 e	10.7 e	..
Germany	5.8 s	3.8	3.3	4.4	4.2	4.2	5.3 p
Greece	0.5	1.8	1.7	1.5	1.6	1.5	..
Hungary	0.1	0.4	0.0	0.0	0.3	6.4	..
Iceland	0.0	0.0	0.0	0.0	..	0.0	..
Ireland	0.0	0.0	0.0	0.0	0.0	0.0	..
Israel	..	..	..	..	..	..	..
Italy	3.6	0.6	0.6	0.6	0.5	0.6	..
Japan	4.0 d m	2.7 b d p	2.2 d p	2.3 d p	1.4 d p	1.4 d p	1.8 b d
Korea	12.4 b d	15.0	15.8	16.3	16.6	15.6	..
Latvia	1.1	.. c	.. c	.. c	..	1.6	..
Lithuania	0.2	0.1	0.2	0.3 p	7.0	2.2	..
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0	..
Mexico	0.0	0.2 p	0.1	0.2	0.2	0.2	0.2 p
Netherlands	2.0	1.1	1.2	1.2	1.9	3.1	2.7 p
New Zealand	..	0.0	..	..	..	..	..
Norway	6.4	3.5	3.5	3.0 b	2.9	3.2	3.1
Poland	1.3	9.2	5.8	4.7 b	3.5	4.4	..
Portugal	0.1	0.3	0.4	0.3	0.2	0.3	..
Slovak Republic	8.3 d	1.7	1.8	2.4	2.0	2.2	..
Slovenia	4.9	0.3	0.3	0.6	0.6	0.6	..
Spain	3.9	1.1	0.9	1.5	1.4	1.1	..
Sweden	17.4	2.2 e	2.4 e	2.8 e	2.5 e	2.2 e	..
Switzerland	..	0.3 b	0.4	0.4	0.4	0.6	..
Türkiye	..	17.3	20.0	18.7	13.4	15.6	36.4 p
United Kingdom	23.5	15.0	14.0	8.4	7.7	..	..
United States	49.1	43.5	46.7	46.9	47.1	47.2	46.1
EU27 (from 01/02/2020)	8.1 e	3.3 e	2.8 e	3.4 e	3.4 e	3.9 e	..
<b>OECD-Total</b>	<b>26.0 e</b>	<b>18.6 e</b>	<b>20.3 e</b>	<b>19.7 e</b>	<b>18.8 e</b>	<b>18.5 e</b>	<b>..</b>
Argentina	0.4 d	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	1.7	4.5	7.7	8.3	6.5	3.4	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	10.6	6.4	7.0	9.8	8.1	8.0	9.8

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 59. Civil Budget R&D**  
As a percentage of total GBARD (Government budget allocations for R&D)

Percentage

	2005	2017	2018	2019	2020	2021	2022
Australia	93.1 d	92.6 d	92.8 d	93.8 d	93.8 d p	93.6 d p	..
Austria	100.0 d	99.8 d	99.8 d	99.8 d	99.9 d	99.8 d	99.8 p
Belgium	99.7	99.9	99.9	99.9	99.3	99.2	..
Canada	95.9 d	..	..	..	..	..	..
Chile	..	100.0	100.0	100.0	..	..	..
Colombia	98.7	98.3	98.1	99.1	99.1	..	..
Czech Republic	97.5	98.7	98.8	98.9	99.0	99.7	99.3 p
Denmark	99.3	99.7 e	99.7 e	99.7 e p	99.7 e	99.6 e	99.6 e p
Estonia	99.0 e	98.1	96.6	98.3	97.6	97.8	..
Finland	96.7	97.8	97.6	97.5	98.0	97.9	..
France	79.2	92.0 e	93.3 e	92.5 e	91.4 e	89.3 e	..
Germany	94.2 s	96.2	96.7	95.6	95.8	95.8	94.7 p
Greece	99.5	98.2	98.3	98.5	98.4	98.5	..
Hungary	99.9	99.6	100.0	100.0	99.7	93.6	..
Iceland	100.0	100.0	100.0	100.0	..	100.0	..
Ireland	100.0	100.0	100.0	100.0	100.0	100.0	..
Israel	..	..	..	..	..	..	..
Italy	96.4	99.4	99.4	99.4	99.5	99.4	..
Japan	96.0 d	97.3 b d p	97.8 d p	97.7 d p	98.6 d p	98.6 d p	98.2 b d
Korea	87.6 b d	85.0	84.2	83.7	83.4	84.4	..
Latvia	98.9	.. c	.. c	.. c	..	98.4	..
Lithuania	99.8	99.9	99.8	99.7 p	93.0	97.8	..
Luxembourg	100.0	100.0	100.0	100.0	100.0	100.0	..
Mexico	100.0	99.8 p	99.9	99.8	99.8	99.8	99.8 p
Netherlands	98.0	98.9	98.8	98.8	98.1	96.9	97.3 p
New Zealand	..	100.0	..	..	..	..	..
Norway	93.6	96.5	96.5	97.0 b	97.1	96.8	96.9
Poland	98.7	90.8	94.2	95.3 b	96.5	95.6	..
Portugal	99.9	99.7	99.6	99.7	99.8	99.7	..
Slovak Republic	91.7 d	98.3	98.2	97.6	98.0	97.8	..
Slovenia	95.1	99.7	99.7	99.4	99.4	99.4	..
Spain	96.1	98.9	99.1	98.5	98.6	98.9	..
Sweden	82.6	97.8 e	97.6 e	97.2 e	97.5 e	97.8 e	..
Switzerland	..	99.7 b	99.6	99.6	99.6	99.4	..
Türkiye	..	82.7	80.0	81.3	86.6	84.4	63.6 p
United Kingdom	76.5	85.0	86.0	91.6	92.3	..	..
United States	50.9	56.5	53.3	53.1	52.9	52.8	53.9
EU27 (from 01/02/2020)	91.9 e	96.7 e	97.2 e	96.6 e	96.6 e	96.1 e	..
<b>OECD-Total</b>	<b>74.0 e</b>	<b>81.4 e</b>	<b>79.7 e</b>	<b>80.3 e</b>	<b>81.2 e</b>	<b>81.5 e</b>	<b>..</b>
Argentina	99.6 d	..	..	..	..	..	..
China	..	..	..	..	..	..	..
Romania	98.3	95.5	92.3	91.7	93.5	96.6	..
Russian Federation	..	..	..	..	..	..	..
Singapore	..	..	..	..	..	..	..
South Africa	..	..	..	..	..	..	..
Chinese Taipei	89.4	93.6	93.0	90.2	91.9	92.0	90.2

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Main Science and Technology Indicators database

**Table 60. Triadic patent families**  
By priority year

Number

	2005	2015	2016	2017	2018	2019	2020
Australia	479	351	367	372	386	365 e	376 e
Austria	411	404	376	440	443	423 e	437 e
Belgium	543	425	426	411	413	395 e	403 e
Canada	719	590	656	630	684	679 e	676 e
Chile	6	13	10	13	14	14 e	14 e
Colombia	2	5	3	9	10	10 e	10 e
Czech Republic	25	53	57	37	44	42 e	41 e
Denmark	390	326	306	306	317	320 e	325 e
Estonia	3	4	4	4	7	7 e	7 e
Finland	392	268	280	307	312	306 e	303 e
France	3 049	2 307	2 142	2 030	1 936	1 860 e	1 875 e
Germany	7 145	4 761	4 918	4 731	4 622	4 382 e	4 454 e
Greece	24	10	15	26	23	24 e	24 e
Hungary	58	36	50	31	58	61 e	59 e
Iceland	7	5	2	3	5	5 e	5 e
Ireland	99	100	105	111	113	117 e	124 e
Israel	502	515	501	600	616	586 e	596 e
Italy	966	828	944	875	896	857 e	892 e
Japan	18 932	17 796	18 078	18 361	18 146	17 555 e	17 053 e
Korea	2 747	2 259	2 398	2 907	3 165	3 366 e	3 379 e
Latvia	10	4	5	4	8	8 e	10 e
Lithuania	1.0	3.6	6.7	4.8	9.9	10.7 e	12.1 e
Luxembourg	21	23	36	22	25	25 e	26 e
Mexico	19	30	25	21	21	20 e	19 e
Netherlands	1 762	1 139	962	910	894	857 e	867 e
New Zealand	73	70	58	58	58	58 e	63 e
Norway	141	101	142	117	127	122 e	119 e
Poland	18	81	77	73	78	76 e	77 e
Portugal	16	33	49	40	44	44 e	43 e
Slovak Republic	2	9	11	9	10	10 e	10 e
Slovenia	22	7	9	14	15	15 e	16 e
Spain	293	293	328	290	303	305 e	301 e
Sweden	969	731	780	813	888	867 e	868 e
Switzerland	1 083	1 225	1 210	1 278	1 273	1 269 e	1 337 e
Türkiye	16	50	65	54	76	70 e	70 e
United Kingdom	2 166	1 687	1 645	1 686	1 696	1 709 e	1 732 e
United States	17 374	13 721	13 434	13 164	13 394	13 058 e	13 294 e
EU27 (from 01/02/2020)	16 250	11 874	11 917	11 515	11 494	11 048 e	11 210 e
<b>OECD-Total</b>	<b>60 484</b>	<b>50 264</b>	<b>50 478</b>	<b>50 764</b>	<b>51 132</b>	<b>49 897 e</b>	<b>49 915 e</b>
Argentina	16	11	14	10	11	10 e	11 e
China	524	3 260	3 506	4 455	5 046	5 896 e	6 039 e
Romania	7	14	14	9	17	16 e	15 e
Russian Federation	91	90	116	129	141	136 e	139 e
Singapore	171	121	136	136	168	173 e	179 e
South Africa	49	25	28	21	22	20 e	20 e
Chinese Taipei	145	445	522	711	729	703 e	696 e

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Patent database

**Table 61. Share of countries in triadic patent families**  
By priority year

Percentage

	2005	2015	2016	2017	2018	2019	2020
Australia	0.77	0.64	0.66	0.65	0.66	0.63 e	0.65 e
Austria	0.66	0.73	0.68	0.77	0.76	0.73 e	0.75 e
Belgium	0.88	0.77	0.77	0.72	0.71	0.68 e	0.70 e
Canada	1.16	1.07	1.18	1.10	1.18	1.18 e	1.17 e
Chile	0.01	0.02	0.02	0.02	0.02	0.02 e	0.02 e
Colombia	0.00	0.01	0.01	0.02	0.02	0.02 e	0.02 e
Czech Republic	0.04	0.10	0.10	0.07	0.08	0.07 e	0.07 e
Denmark	0.63	0.59	0.55	0.54	0.55	0.56 e	0.56 e
Estonia	0.00	0.01	0.01	0.01	0.01	0.01 e	0.01 e
Finland	0.63	0.49	0.50	0.54	0.54	0.53 e	0.52 e
France	4.92	4.19	3.85	3.56	3.33	3.23 e	3.24 e
Germany	11.53	8.65	8.85	8.29	7.95	7.60 e	7.69 e
Greece	0.04	0.02	0.03	0.05	0.04	0.04 e	0.04 e
Hungary	0.09	0.07	0.09	0.06	0.10	0.11 e	0.10 e
Iceland	0.01	0.01	0.00	0.01	0.01	0.01 e	0.01 e
Ireland	0.16	0.18	0.19	0.20	0.20	0.20 e	0.21 e
Israel	0.81	0.94	0.90	1.05	1.06	1.02 e	1.03 e
Italy	1.56	1.50	1.70	1.53	1.54	1.49 e	1.54 e
Japan	30.54	32.34	32.52	32.18	31.23	30.43 e	29.45 e
Korea	4.43	4.10	4.31	5.10	5.45	5.83 e	5.84 e
Latvia	0.02	0.01	0.01	0.01	0.01	0.01 e	0.02 e
Lithuania	0.0	0.0	0.0	0.0	0.0	0.0 e	0.0 e
Luxembourg	0.03	0.04	0.06	0.04	0.04	0.04 e	0.04 e
Mexico	0.03	0.05	0.04	0.04	0.04	0.03 e	0.03 e
Netherlands	2.84	2.07	1.73	1.59	1.54	1.49 e	1.50 e
New Zealand	0.12	0.13	0.10	0.10	0.10	0.10 e	0.11 e
Norway	0.23	0.18	0.26	0.20	0.22	0.21 e	0.21 e
Poland	0.03	0.15	0.14	0.13	0.13	0.13 e	0.13 e
Portugal	0.03	0.06	0.09	0.07	0.08	0.08 e	0.07 e
Slovak Republic	0.00	0.02	0.02	0.02	0.02	0.02 e	0.02 e
Slovenia	0.04	0.01	0.02	0.02	0.03	0.03 e	0.03 e
Spain	0.47	0.53	0.59	0.51	0.52	0.53 e	0.52 e
Sweden	1.56	1.33	1.40	1.42	1.53	1.50 e	1.50 e
Switzerland	1.75	2.23	2.18	2.24	2.19	2.20 e	2.31 e
Türkiye	0.03	0.09	0.12	0.09	0.13	0.12 e	0.12 e
United Kingdom	3.49	3.07	2.96	2.96	2.92	2.96 e	2.99 e
United States	28.03	24.93	24.17	23.07	23.05	22.64 e	22.96 e
EU27 (from 01/02/2020)	26.21	21.58	21.44	20.18	19.78	19.15 e	19.36 e
<b>OECD-Total</b>	<b>97.57</b>	<b>91.34</b>	<b>90.81</b>	<b>88.98</b>	<b>88.01</b>	<b>86.51 e</b>	<b>86.20 e</b>
Argentina	0.03	0.02	0.02	0.02	0.02	0.02 e	0.02 e
China	0.84	5.92	6.31	7.81	8.68	10.22 e	10.43 e
Romania	0.01	0.02	0.03	0.02	0.03	0.03 e	0.03 e
Russian Federation	0.15	0.16	0.21	0.23	0.24	0.24 e	0.24 e
Singapore	0.28	0.22	0.25	0.24	0.29	0.30 e	0.31 e
South Africa	0.08	0.04	0.05	0.04	0.04	0.03 e	0.04 e
Chinese Taipei	0.23	0.81	0.94	1.25	1.25	1.22 e	1.20 e

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Patent database

**Table 62. Patents in the ICT sector - applications filed under the PCT**  
By priority year

Number

	2005	2015	2016	2017	2018	2019	2020
Australia	385	392	387	349	338	317	253
Austria	210	151	170	169	161	148	143
Belgium	142	206	193	184	152	150	122
Canada	805	876	891	815	859	900	999
Chile	2	19	10	4	11	8	15
Colombia	3.0	6.8	5.1	7.0	13.5	8.3	7.5
Czech Republic	18	21	20	29	18	29	15
Denmark	160	150	132	118	134	218	230
Estonia	6	7	10	10	12	16	7
Finland	747	492	480	573	580	524	544
France	1 494	1 319	1 260	1 280	1 317	1 296	1 149
Germany	2 271	2 497	2 591	2 900	3 034	3 040	2 877
Greece	14	11	22	20	20	33	19
Hungary	27	55	71	54	77	58	75
Iceland	5	2	0	3	0	2	2
Ireland	84	131	167	142	87	91	113
Israel	666	747	719	628	556	540	508
Italy	343	302	303	307	323	294	360
Japan	6 328	10 301	10 762	11 190	12 103	11 988	11 872
Korea	2 127	5 361	4 952	5 267	6 159	7 175	6 840
Latvia	4	7	1	4	4	0	4
Lithuania	2.1	4.0	4.3	5.5	3.0	5.4	7.5
Luxembourg	5	7	24	19	16	11	16
Mexico	14	49	43	42	19	19	16
Netherlands	1 266	577	524	482	464	511	519
New Zealand	42	35	31	32	27	30	84
Norway	95	71	72	95	119	75	77
Poland	13	103	79	65	71	80	105
Portugal	20	33	38	31	35	42	41
Slovak Republic	3	13	9	3	8	8	6
Slovenia	5	8	7	4	5	6	3
Spain	130	174	201	178	220	249	276
Sweden	681	1 386	1 411	1 483	1 458	1 528	1 439
Switzerland	219	261	336	317	319	318	333
Türkiye	11	153	169	187	223	184	203
United Kingdom	1 339	1 328	1 408	1 449	1 427	1 276	1 322
United States	14 840	16 649	16 709	16 610	16 444	17 570	18 286
EU27 (from 01/02/2020)	7 667	7 711	7 753	8 089	8 227	8 369	8 120
<b>OECD-Total</b>	<b>34 528</b>	<b>43 921</b>	<b>44 210</b>	<b>45 057</b>	<b>46 818</b>	<b>48 750</b>	<b>48 890</b>
Argentina	7	11	4	5	3	3	2
China	1 804	18 541	21 624	24 213	25 556	28 590	30 417
Romania	6	35	21	13	13	16	25
Russian Federation	153	259	266	230	245	242	210
Singapore	192	239	230	284	302	320	303
South Africa	53	52	48	43	68	37	35
Chinese Taipei	64	219	250	389	353	304	242

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Patent database

**Table 63. Patents in the biotechnology sector - applications filed under the PCT**  
By priority year

Number

	2005	2015	2016	2017	2018	2019	2020
Australia	219	166	162	174	178	182	190
Austria	61	78	63	69	76	67	85
Belgium	118	130	141	142	125	183	168
Canada	309	258	239	254	284	252	295
Chile	3	36	23	32	32	29	27
Colombia	1.0	10.4	6.8	11.6	8.7	8.1	8.0
Czech Republic	5	14	8	12	7	12	13
Denmark	193	167	168	190	175	161	173
Estonia	2	3	5	6	3	8	5
Finland	49	48	53	43	49	48	58
France	341	547	517	529	474	458	532
Germany	702	707	624	674	637	669	773
Greece	6	5	6	7	4	7	7
Hungary	10	16	13	14	13	11	13
Iceland	5	2	0	2	3	1	1
Ireland	27	30	37	27	33	41	36
Israel	171	198	185	214	220	222	281
Italy	169	148	170	160	184	168	214
Japan	1 449	1 459	1 649	1 581	1 733	1 654	1 538
Korea	219	738	883	938	1 019	1 069	1 422
Latvia	1	1	3	2	4	2	2
Lithuania	1.3	4.0	2.8	6.7	3.5	6.7	4.5
Luxembourg	1	8	4	6	2	5	3
Mexico	11	25	22	21	18	17	23
Netherlands	235	257	230	222	244	216	283
New Zealand	52	26	26	28	20	21	25
Norway	32	35	47	29	37	24	37
Poland	10	33	25	23	28	34	43
Portugal	10	17	15	18	24	23	30
Slovak Republic	0	2	5	3	4	8	6
Slovenia	4	6	3	6	7	10	24
Spain	123	172	134	168	160	181	197
Sweden	135	116	139	124	127	130	142
Switzerland	150	215	203	237	249	253	292
Türkiye	2	16	25	34	50	86	68
United Kingdom	517	538	496	508	578	600	669
United States	4 752	5 535	5 734	6 058	6 438	6 570	7 458
EU27 (from 01/02/2020)	2 208	2 514	2 372	2 461	2 391	2 461	2 826
<b>OECD-Total</b>	<b>10 093</b>	<b>11 765</b>	<b>12 065</b>	<b>12 571</b>	<b>13 255</b>	<b>13 437</b>	<b>15 151</b>
Argentina	10	6	5	2	9	11	10
China	122	846	1 123	1 536	1 887	2 084	2 884
Romania	1	2	0	1	1	0	1
Russian Federation	60	51	34	61	68	63	84
Singapore	64	90	107	105	88	126	135
South Africa	16	16	16	16	13	5	16
Chinese Taipei	11	92	87	89	78	64	86

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, Patent database



**Table 64. Trade balance and export market share: Pharmaceutical industry**

	Trade balance (Million current USD)			Export market share (Percentage)		
	2015	2018	2021	2015	2018	2021
Australia	-5 842.9	-5 293.45	-8 458.58	0.36	0.57	..
Austria	369.5	172.32	450.31	1.82	1.70	..
Belgium	3 209.5	5 020.24	17 281.75	3.16	5.44	..
Canada	-4 715.2	-5 920.33	-9 792.07	1.54	1.29	..
Chile	-1 114.5	-1 474.29	-2 318.09	0.04	0.03	..
Colombia	-1 966.3	-2 196.46	-3 687.09	0.10	0.06	..
Czech Republic	-1 666.1	-2 224.63	-3 437.91	0.47	0.48	..
Denmark	8 722.4	11 078.56	14 857.49	2.51	2.54	..
Estonia	-328.9	-478.11	-665.88	0.01	0.02	..
Finland	-1 254.7	-1 420.81	-1 420.28	0.19	0.14	..
France	4 665.7	5 367.80	3 587.63	6.10	5.59	..
Germany	28 328.1	37 259.45	36 665.54	15.08	15.73	..
Greece	-1 954.9	-2 019.85	-950.08	0.22	0.28	..
Hungary	749.4	679.97	791.46	0.93	0.96	..
Iceland	-47.7	-161.57	-237.37	0.02	0.00	..
Ireland	27 000.2	41 314.76	..	6.63	8.86	..
Israel	4 608.3	3 195.05	-1 525.85	1.30	0.92	..
Italy	-2 468.8	-681.77	4 506.71	4.18	4.74	..
Japan	-20 167.4	-20 652.17	-30 167.12	0.74	0.93	..
Korea	-2 862.6	-3 284.06	..	0.45	0.60	..
Latvia	-200.0	-181.36	-261.75	0.07	0.09	..
Lithuania	-369.7	-343.08	-602.23	0.14	0.14	..
Luxembourg	-314.2	-406.48	-480.41	0.02	0.02	..
Mexico	-3 319.8	-3 701.75	-4 533.73	0.39	0.25	..
Netherlands	8 353.9	11 596.94	11 418.35	4.58	4.60	..
New Zealand	-533.3	-673.10	-790.33	0.07	0.06	..
Norway	-1 080.0	-1 402.19	-2 186.99	0.14	0.15	..
Poland	-2 231.4	-3 904.15	-5 108.50	0.61	0.61	..
Portugal	-1 568.1	-2 088.06	-2 314.85	0.20	0.20	..
Slovak Republic	-1 284.3	-1 555.76	-2 050.47	0.11	0.07	..
Slovenia	1 474.2	1 591.65	3 098.11	0.52	0.59	..
Spain	-3 198.4	-4 258.02	-4 658.75	2.37	1.97	..
Sweden	4 527.4	4 743.49	5 640.09	1.66	1.52	..
Switzerland	41 235.8	47 548.07	62 843.96	12.77	12.79	..
Türkiye	-3 652.2	-3 532.01	-5 278.50	0.22	0.21	..
United Kingdom	2 059.0	-372.26	384.71	7.24	5.37	..
United States	-37 945.4	-67 899.73	-77 307.48	10.19	8.34	..
EU27 (from 01/02/2020)	..	..	..	..	..	..
<b>OECD-Total</b>	<b>35 216.5</b>	<b>33 442.86</b>	<b>..</b>	<b>87.15</b>	<b>87.85</b>	<b>..</b>
Argentina	-1 442.5	-1 822.75	-2 685.84	0.23	0.12	..
China	-6 522.2	-11 730.28	4 925.96	2.69	2.83	..
Romania	-1 931.0	-2 669.75	-3 712.07	0.19	0.15	..
Russian Federation	-8 444.6	-10 146.42	-11 807.65	0.11	0.13	..
Singapore	4 841.0	6 164.81	..	1.47	1.52	..
South Africa	-1 830.8	-2 126.88	..	0.08	0.07	..
Chinese Taipei	-2 417.3	-3 361.85	-4 600.18	0.10	0.10	..

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database

**Table 65. Trade balance and export market share: Computer, electronic and optical industry**

	Trade balance (Million current USD)			Export market share (Percentage)		
	2015	2018	2021	2015	2018	2021
Australia	-20 565.2	-24 834.03	-26 815.78	0.18	0.16	..
Austria	-1 239.1	-2 697.98	-4 431.22	0.40	0.37	..
Belgium	-4 522.6	-5 622.88	-6 357.89	0.38	0.35	..
Canada	-24 465.0	-27 554.43	-31 542.83	0.59	0.51	..
Chile	-5 640.9	-6 507.01	-8 885.72	0.01	0.01	..
Colombia	-5 936.7	-5 801.17	-6 622.19	0.01	0.00	..
Czech Republic	-955.2	518.78	-219.19	1.01	1.23	..
Denmark	-1 675.4	-1 818.22	-2 547.65	0.27	0.26	..
Estonia	-95.7	-143.44	413.00	0.08	0.07	..
Finland	-2 182.0	-3 251.39	-3 157.57	0.13	0.14	..
France	-17 011.2	-17 626.39	-26 788.63	1.41	1.31	..
Germany	-7 936.1	-5 171.58	-12 529.89	4.65	5.02	..
Greece	-1 703.8	-1 945.58	-2 968.05	0.05	0.06	..
Hungary	455.7	303.10	-644.37	0.58	0.62	..
Iceland	-321.2	-478.16	-685.97	0.00	0.00	..
Ireland	3 958.4	7 221.88	..	0.51	0.61	..
Israel	3 766.5	2 590.97	2 658.66	0.52	0.40	..
Italy	-13 796.0	-14 990.52	-17 626.50	0.65	0.67	..
Japan	-10 609.1	-9 237.00	-11 853.86	3.65	3.55	..
Korea	63 978.4	96 756.98	..	5.99	6.76	..
Latvia	-176.5	-417.74	-487.69	0.06	0.05	..
Lithuania	-454.1	-563.20	-889.39	0.06	0.06	..
Luxembourg	-540.1	-633.90	-694.66	0.02	0.02	..
Mexico	-5 932.6	-3 954.19	-13 660.75	3.03	2.83	..
Netherlands	-2 994.3	-5 636.91	-5 972.88	2.57	2.66	..
New Zealand	-2 983.5	-3 311.33	-3 643.46	0.02	0.02	..
Norway	-4 206.6	-5 416.13	-6 096.70	0.13	0.09	..
Poland	-4 268.9	-5 416.74	-9 978.18	0.74	0.78	..
Portugal	-2 102.1	-2 696.76	-3 700.95	0.09	0.14	..
Slovak Republic	-558.0	-256.41	-1 380.49	0.55	0.50	..
Slovenia	-385.1	-587.15	-1 036.81	0.04	0.04	..
Spain	-14 660.6	-17 252.03	-19 233.79	0.26	0.28	..
Sweden	-3 627.8	-5 826.99	-6 994.92	0.54	0.46	..
Switzerland	16 353.4	15 207.40	18 228.06	1.40	1.18	..
Türkiye	-12 409.2	-10 397.97	-12 312.41	0.13	0.10	..
United Kingdom	-32 184.2	-35 777.25	-31 771.48	1.44	1.23	..
United States	-181 709.4	-212 256.69	-262 070.76	8.13	7.26	..
EU27 (from 01/02/2020)	..	..	..	..	..	..
<b>OECD-Total</b>	<b>-299 335.7</b>	<b>-315 482.05</b>	<b>..</b>	<b>40.29</b>	<b>39.80</b>	<b>..</b>
Argentina	-6 888.5	-6 025.61	-6 703.57	0.01	0.00	..
China	184 852.3	160 066.94	199 054.41	28.15	26.22	..
Romania	-3 270.4	-4 114.31	-5 453.26	0.13	0.18	..
Russian Federation	-16 133.3	-24 464.36	-30 587.45	0.17	0.13	..
Singapore	36 350.8	27 757.50	..	5.40	4.90	..
South Africa	-7 414.5	-7 445.48	..	0.07	0.05	..
Chinese Taipei	68 266.9	75 984.40	116 515.17	5.27	5.58	..

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database

**Table 66. Trade balance and export market share: Aerospace industry**

	Trade balance (Million current USD)			Export market share (Percentage)		
	2015	2018	2021	2015	2018	2021
Australia	225.63	-445.95	-1 305.60	0.39	0.40	..
Austria	590.12	967.80	455.43	0.37	0.40	..
Belgium	791.27	368.78	-901.46	0.58	0.58	..
Canada	2 590.54	2 006.49	4 045.92	3.85	3.32	..
Chile	-1 067.40	-478.52	169.65	0.01	0.01	..
Colombia	-2 763.46	-1 259.21	-1 386.40	0.01	0.01	..
Czech Republic	348.15	-564.22	318.76	0.18	0.23	..
Denmark	-42.27	-286.43	-342.69	0.14	0.10	..
Estonia	-16.37	13.90	-35.65	0.01	0.02	..
Finland	-221.08	-356.97	351.93	0.16	0.03	..
France	24 609.74	32 112.52	22 862.96	15.99	14.88	..
Germany	16 376.39	22 288.41	9 873.13	12.35	11.35	..
Greece	-173.00	-95.22	-108.14	0.03	0.01	..
Hungary	-687.70	-835.85	-1 249.76	0.03	0.14	..
Iceland	-202.79	-205.61	-171.01	0.00	0.00	..
Ireland	-6 883.84	-18 595.77	..	1.61	1.45	..
Israel	2 071.53	172.84	1 689.74	0.76	0.52	..
Italy	2 713.69	3 318.70	-1 712.62	1.56	1.49	..
Japan	-2 323.27	-6 048.50	-5 829.15	1.97	1.76	..
Korea	-2 463.15	-988.26	..	0.53	0.69	..
Latvia	-156.59	-557.62	-776.44	0.00	0.11	..
Lithuania	-25.39	-17.61	-46.49	0.01	0.01	..
Luxembourg	-1 121.95	-278.90	-925.51	0.05	0.03	..
Mexico	829.96	1 166.20	769.22	0.49	0.65	..
Netherlands	-391.11	617.50	147.39	0.88	1.26	..
New Zealand	-1 685.28	-1 513.41	-570.49	0.02	0.02	..
Norway	-682.50	-1 365.44	-1 098.79	0.20	0.21	..
Poland	830.87	1 035.92	1 208.12	0.56	0.84	..
Portugal	-226.98	-1 006.57	-437.49	0.06	0.10	..
Slovak Republic	-14.56	-77.02	-10.31	0.01	0.01	..
Slovenia	41.05	-40.74	10.69	0.02	0.03	..
Spain	701.40	1 612.01	1 474.72	1.28	1.58	..
Sweden	-221.13	-371.95	151.31	0.19	0.19	..
Switzerland	518.64	-1 761.01	-636.88	0.67	0.45	..
Türkiye	-3 459.84	-2 642.89	-1 742.61	0.26	0.32	..
United Kingdom	7 080.98	13 088.26	14 929.50	9.23	9.59	..
United States	79 083.71	85 389.06	48 889.98	33.43	31.35	..
EU27 (from 01/02/2020)	..	..	..	..	..	..
<b>OECD-Total</b>	<b>114 574.01</b>	<b>124 364.74</b>	<b>..</b>	<b>87.90</b>	<b>84.14</b>	<b>..</b>
Argentina	-426.86	-45.39	-134.80	0.06	0.03	..
China	-23 633.48	-28 689.87	-13 703.52	1.60	1.71	..
Romania	113.85	66.71	182.70	0.07	0.10	..
Russian Federation	95.24	-2 435.08	1 855.71	0.94	0.89	..
Singapore	-2 052.85	-6 520.14	..	2.67	4.15	..
South Africa	-469.91	-511.69	..	0.17	0.08	..
Chinese Taipei	-1 806.92	-3 291.47	-2 854.99	0.21	0.68	..

Note: Detailed metadata: <http://metalinks.oecd.org/msti/20230612/d19a>

Source: OECD, STAN Bilateral Trade in Goods by Industry and End-use Category database





**From:**  
**Main Science and Technology Indicators, Volume 2022 Issue 2**

**Access the complete publication at:**

<https://doi.org/10.1787/1cdcb031-en>

**Please cite this chapter as:**

OECD (2023), "International Comparisons", in *Main Science and Technology Indicators, Volume 2022 Issue 2*, OECD Publishing, Paris.

DOI: <https://doi.org/10.1787/db4ee0f7-en>

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