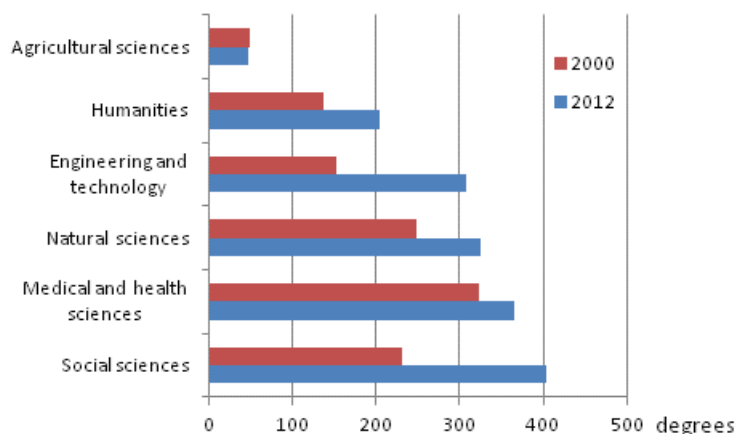


Human resources of science and technology in 2012

A growing number of doctorate degrees attained by foreigners

A total of 1,143 doctorate degrees were attained in 2000. Of these, 87 were attained by foreign citizens, i.e. close on eight per cent. The median age of those having completed doctorate degrees was 35.7 years. Nearly 55 per cent of them were men. According to Statistics Finland, a good decade later the corresponding figures were 1,655 new doctorate degrees, of which slightly over one-half were attained by women. The new doctors were slightly younger, the median age 35.3 years. The share of foreign citizens was nearly 18 per cent and the number of degrees was more than triple, 293 degrees, compared with the turn of the millennium.

Doctorate degrees by field of science in 2000 and 2012



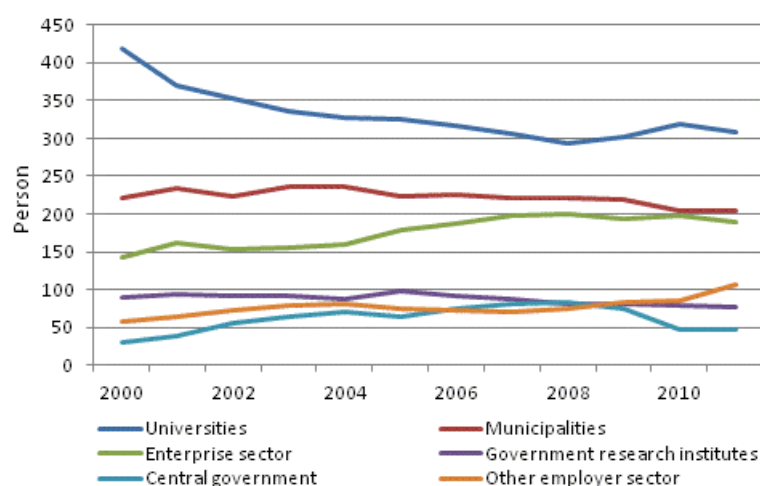
A majority of millennium doctors, 28 per cent attained their degree in the field of medical and health, good one-fifth in the fields of science and social sciences, 13 per cent in the field of technology, 12 per cent in the field of humanities, and four per cent in the field of agriculture and forestry. In 2012, double the number of doctors of science in technology were educated, in the field of social sciences the number

of degrees grew by 74 per cent and in the field of humanities by nearly 50 per cent. The changes were smaller in other fields.

Where are the millennium doctors now?

At the end of the year in which the degree was attained, 84 per cent of the millennium doctors were employed, 11 per cent were unemployed or in the inactive population. Five per cent did not belong to the population. Thirty-six per cent of them were foreign citizens and the rest mainly Finns that had moved abroad. In 2011, 82 per cent of the millennium doctors were employed. One in ten were either in the inactive population or unemployed. The share of those not belonging to the population had grown by four percentage points.

Placement of employed millennium doctors by employer sector in 2000 to 2011



Of the millennium doctors, 44 per cent initially worked at the university but already in the year following graduation 50 doctors had moved to other sectors. By 2011 the universities only employed one-third of the target group. The share of the enterprise sector grew from 15 to 20 per cent and the other employer sector from six to 11 per cent during the review period. In central government, the share of millennium doctors grew from three to nine per cent at its highest in 2008, after which the share dropped to five per cent towards the end of the review period. Municipalities and joint municipal authorities, as well as central government research institutes have employed the target group evenly.

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Appendix tables

Appendix table 1. Tertiary degrees by the field of science in 1992, 2000 and 2012

| Tertiary degree | Fields of science | Year (completion of degree) | | |
|------------------------------|-----------------------------|-----------------------------|--------|--------|
| | | 1992 | 2000 | 2012 |
| Tertiary degrees total | Fields of science total | 40,675 | 37,225 | 53,302 |
| Doctorate | Fields of science total | 546 | 1,142 | 1,655 |
| | Natural sciences | 118 | 245 | 326 |
| | Engineering and technology | 88 | 152 | 307 |
| | Medical and health sciences | 178 | 330 | 366 |
| | Agricultural sciences | 24 | 43 | 48 |
| | Social sciences | 85 | 234 | 404 |
| | Humanities | 53 | 138 | 204 |
| Licentiate | Fields of science total | 680 | 746 | 179 |
| | Natural sciences | 153 | 177 | 27 |
| | Engineering and technology | 166 | 145 | 44 |
| | Medical and health sciences | 17 | 27 | 1 |
| | Agricultural sciences | 24 | 9 | 1 |
| | Social sciences | 205 | 269 | 84 |
| | Humanities | 115 | 119 | 22 |
| Higher level tertiary degree | Fields of science total | 10,285 | 12,404 | 16,093 |
| | Natural sciences | 915 | 1,377 | 1,582 |
| | Engineering and technology | 1,572 | 2,009 | 2,584 |
| | Medical and health sciences | 1,581 | 1,661 | 2,414 |
| | Agricultural sciences | 232 | 219 | 354 |
| | Social sciences | 4,371 | 4,980 | 6,552 |
| | Humanities | 1,614 | 2,158 | 2,607 |
| Other tertiary degrees | Fields of science total | 29,164 | 22,933 | 35,375 |

Appendix table 2. Population with a tertiary degree in 2000 and 2011

| Tertiary degree | Fields of science | 2000 | | 2011 | |
|------------------------|-----------------------------|---------|----------------|-----------|----------------|
| | | Total | of which women | Total | of which women |
| Tertiary degrees total | Fields of science total | 959,363 | 527,502 | 1 213,221 | 693,950 |
| Doctorate | Fields of science total | 14 ,11 | 4,375 | 26,795 | 11,317 |
| | Natural sciences | 3,226 | 874 | 5,873 | 2,164 |
| | Engineering and technology | 1,813 | 205 | 4,185 | 851 |
| | Medical and health sciences | 4,564 | 1,741 | 7,398 | 3,858 |
| | Agricultural sciences | 619 | 237 | 973 | 446 |
| | Social sciences | 2,390 | 785 | 5,520 | 2,621 |
| | Humanities | 1,499 | 533 | 2,846 | 1,377 |
| Licentiate | Fields of science total | 8,466 | 2,951 | 8,891 | 3,740 |
| | Natural sciences | 1,801 | 596 | 1,735 | 674 |
| | Engineering and technology | 2,203 | 337 | 2,333 | 446 |
| | Medical and health sciences | 226 | 175 | 244 | 190 |
| | Agricultural sciences | 202 | 86 | 157 | 65 |
| | Social sciences | 2,619 | 1,073 | 3,065 | 1,630 |
| | Humanities | 1,415 | 684 | 1,357 | 735 |

| Tertiary degree | Fields of science | 2000 | | 2011 | |
|------------------------------|-----------------------------|---------|----------------|---------|----------------|
| | | Total | of which women | Total | of which women |
| Higher level tertiary degree | Fields of science total | 223,751 | 111,838 | 342,061 | 187,712 |
| | Natural sciences | 23,628 | 11,194 | 35,751 | 17,544 |
| | Engineering and technology | 38,267 | 6,043 | 60,669 | 12,500 |
| | Medical and health sciences | 25,133 | 15,784 | 35,104 | 24,093 |
| | Agricultural sciences | 9,009 | 4,036 | 9,512 | 4,842 |
| | Social sciences | 89,321 | 47,120 | 142,769 | 85,165 |
| | Humanities | 38,393 | 27,661 | 58,256 | 43,568 |
| Other tertiary degrees | Field of science undefined | 713,035 | 408,338 | 835,474 | 491,181 |

Appendix table 3. Population with a tertiary degree by principal activity in 2011

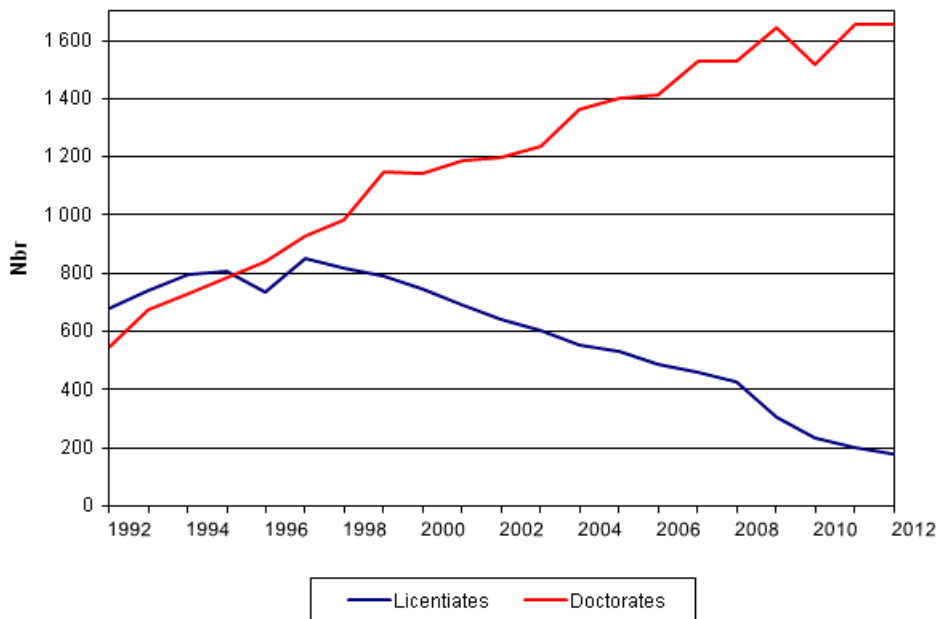
| Tertiary degree | Field of science | 16–74 year old population | In labour force | Employed | Unemployed | Not in labour force |
|------------------------------|-----------------------------|---------------------------|-----------------|----------|------------|---------------------|
| Tertiary degrees total | Fields of science total | 1 213,221 | 970,695 | 922,687 | 48,008 | 242,526 |
| Doctorate | Fields of science total | 26,795 | 22,321 | 21,686 | 635 | 4,474 |
| | Natural sciences | 5,873 | 4,851 | 4,654 | 197 | 1,022 |
| | Engineering and technology | 4,185 | 3,654 | 3,565 | 89 | 531 |
| | Medical and health sciences | 7,398 | 6,196 | 6,123 | 73 | 1,202 |
| | Agricultural sciences | 973 | 796 | 768 | 28 | 177 |
| | Social sciences | 5,520 | 4,578 | 4,436 | 142 | 942 |
| | Humanities | 2,846 | 2,246 | 2,140 | 106 | 600 |
| Licentiate | Fields of science total | 8,891 | 6,677 | 6,338 | 339 | 2,214 |
| | Natural sciences | 1,735 | 1,207 | 1,126 | 81 | 528 |
| | Engineering and technology | 2,333 | 1,866 | 1,785 | 81 | 467 |
| | Medical and health sciences | 244 | 183 | 179 | 4 | 61 |
| | Agricultural sciences | 157 | 108 | 104 | 4 | 49 |
| | Social sciences | 3,065 | 2,356 | 2,264 | 92 | 709 |
| | Humanities | 1,357 | 957 | 880 | 77 | 400 |
| Higher level tertiary degree | Fields of science total | 342,061 | 289,058 | 276,908 | 12,150 | 53,003 |
| | Natural sciences | 35,751 | 29,432 | 27,844 | 1,588 | 6,319 |
| | Engineering and technology | 60,669 | 52,298 | 50,097 | 2,201 | 8,371 |
| | Medical and health sciences | 35,104 | 30,221 | 29,815 | 406 | 4,883 |
| | Agricultural sciences | 9,512 | 7,638 | 7,329 | 309 | 1,874 |
| | Social sciences | 142,769 | 122,573 | 118,032 | 4,541 | 20,196 |
| | Humanities | 58,256 | 46,896 | 43,791 | 3,105 | 11,360 |
| Other tertiary degrees | Field of science undefined | 835,474 | 652,639 | 617,755 | 34,884 | 182,835 |

Appendix table 4. Employed population with tertiary level education in 2011

| Industrial activity 2008 | Tertiary degree total | Doctorate | Licensiate | Higher level tertiary degree | Other tertiary degree |
|--|-----------------------|-----------|------------|------------------------------|-----------------------|
| Toimialat yhteensä | 907,088 | 20,793 | 6,527 | 269,227 | 610,541 |
| Agriculture, forestry and fishing | 16,796 | 83 | 29 | 2,279 | 14,405 |
| Mining and quarrying | 1,281 | 16 | 9 | 304 | 952 |
| Manufacture of food, beverages and tobacco | 7,075 | 45 | 10 | 1,458 | 5,562 |
| Manufacture of textiles and leather | 1,953 | 1 | 5 | 256 | 1,691 |
| Manufacture of wood and paper, printing | 13,431 | 50 | 41 | 2,739 | 10,601 |
| Manufacture of coke and petroleum, rubber and plastic products | 4,277 | 22 | 28 | 996 | 3,231 |
| Manufacture of chemicals and pharmaceutical products | 7,160 | 321 | 100 | 2,629 | 4,110 |
| Manufacture of basic metals and metal products | 12,040 | 47 | 60 | 2,426 | 9,507 |
| Manufacture of computer, electronic and optical products, electrical equipment | 27,475 | 513 | 252 | 11,139 | 15,571 |
| Other machinery and equipment | 18,571 | 128 | 73 | 5,277 | 13,093 |
| Motor vehicles | 3,542 | 15 | 15 | 671 | 2,841 |
| Other manufacturing | 12,107 | 71 | 50 | 2,036 | 9,950 |
| Electricity, gas and water supply and waste management | 9,020 | 66 | 42 | 2,162 | 6,750 |
| Construction | 26,989 | 15 | 46 | 2,671 | 24,257 |
| Whole sale and retail trade, accommodation and food service | 92,697 | 309 | 158 | 13,282 | 78,948 |
| Transportation and storage | 23,284 | 33 | 30 | 3,023 | 20,198 |
| Computer programming and consultancy | 28,322 | 276 | 166 | 11,118 | 16,762 |
| Other information and communication | 24,291 | 172 | 101 | 8,096 | 15,922 |
| Financial and insurance activities | 31,008 | 149 | 127 | 8,864 | 21,868 |
| Research institutes in public sector | 8,155 | 1,804 | 377 | 4,019 | 1,955 |
| Other research and development | 3,212 | 405 | 85 | 1,532 | 1,190 |
| Professional and technical activities | 71,740 | 725 | 479 | 25,368 | 45,168 |
| Administrative and support service activities | 27,696 | 95 | 52 | 5,478 | 22,071 |
| Public administration | 74,195 | 1,041 | 759 | 25,816 | 46,579 |
| Universities | 27,168 | 7,950 | 1,135 | 12,785 | 5,298 |
| Other tertiary level education | 12,063 | 940 | 760 | 6,596 | 3,767 |
| Other education | 88,959 | 577 | 593 | 55,674 | 32,115 |
| Health and social services | 174,987 | 4,037 | 521 | 31,842 | 138,587 |
| Other industries | 49,257 | 632 | 324 | 15,959 | 32,342 |
| Industry unknown | 8,337 | 255 | 100 | 2,732 | 5,250 |

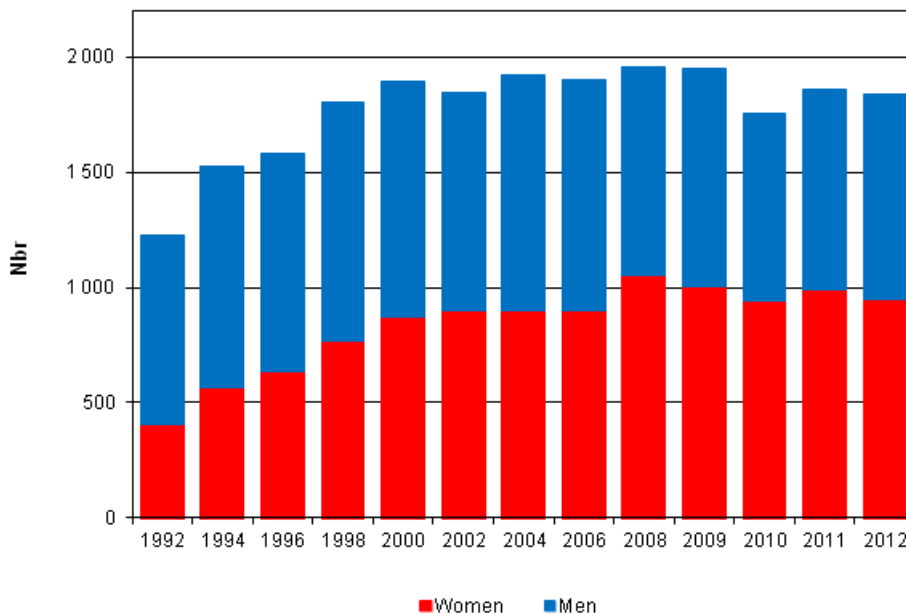
Appendix figures

Appendix figure 1. Doctorate and licentiate degrees in 1992–2012



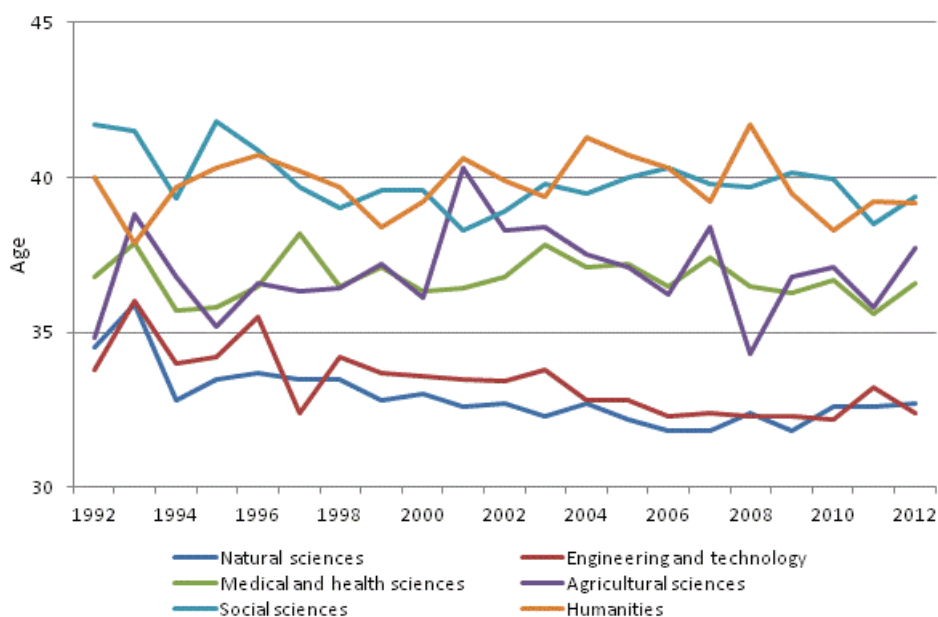
Doctorate degrees attained in 2012 numbered 1,655, which is about the same amount than in the previous year. The popularity of licentiate's degree continued to decline. Only 179 licentiate's degrees were completed in 2012.

Appendix figure 2. Doctorate level degrees by gender 1992–2012



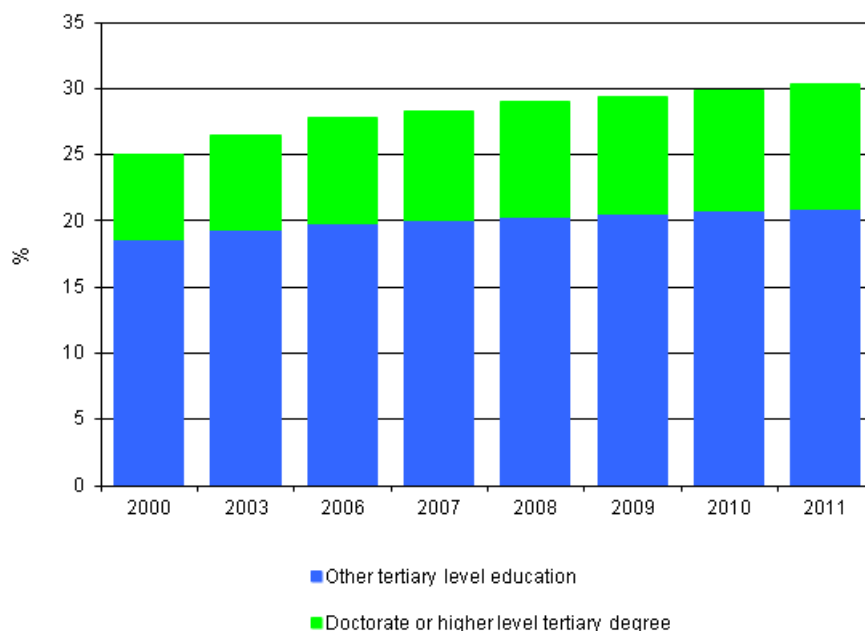
In 2012, 51 per cent of those having completed doctorate degrees were women. As recently as in the early 1990s, less than one-third of the completers of doctorate degrees were women.

Appendix figure 3. Persons with doctorate degree, median ages by the field of science in 1992–2012



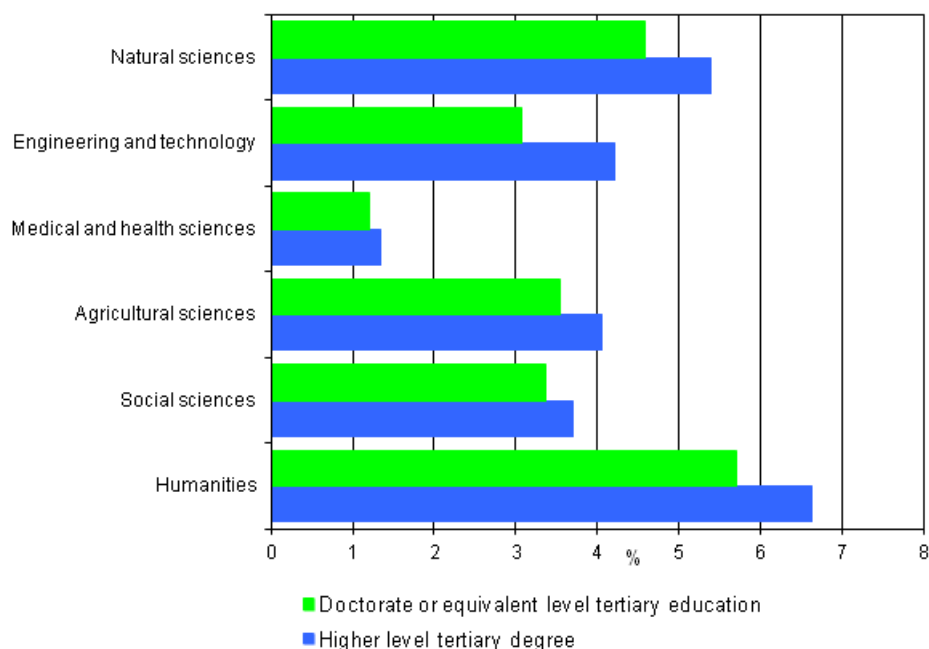
The youngest doctorate degree holders are found in the fields of natural sciences and technology. Their median age is about 32–33 years. The completers of doctorate degrees in the fields of social sciences, and humanities and arts are about seven years older.

Appendix figure 4. Persons with tertiary degrees as a proportion of the population aged 16 to 74 in 2000–2011



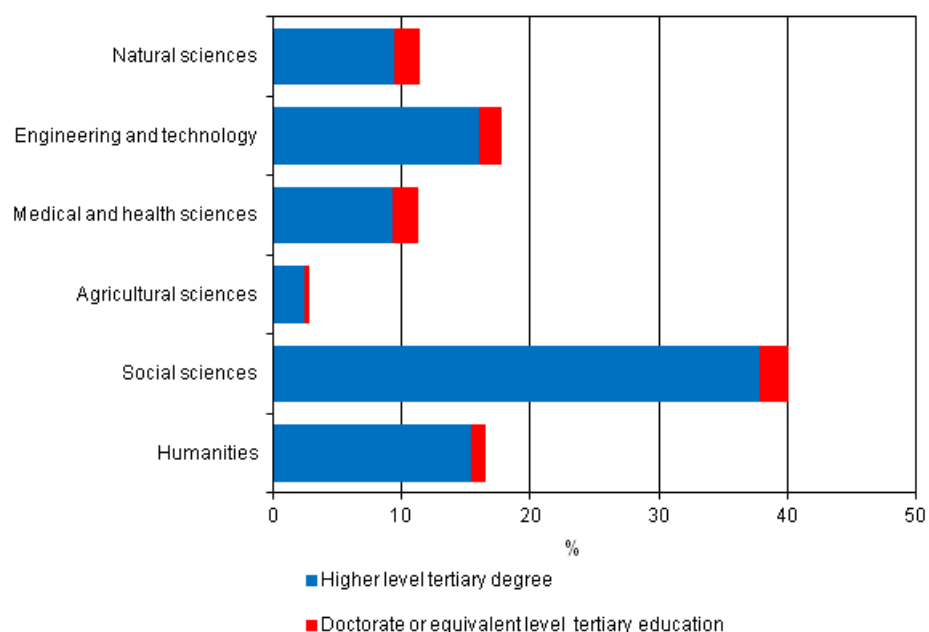
The share of the population with tertiary level degrees has grown steadily at the annual rate of 0.5 per cent throughout the 2000s. In 2011, 30.3 per cent of the population were highly educated. 9.4 per cent of the population had completed doctorate or higher level tertiary degrees.

Appendix figure 5. Unemployment rates of persons with doctorate level and higher level tertiary degree education by the field of science in 2011



The unemployment rate among the highly educated population was five percentage points lower than for the whole population. In 2011, 5.0 per cent of them were unemployed. At that time, the unemployment rate for the whole population was 9.9 per cent. The unemployment rate for those with higher level tertiary degrees was 4.2 per cent and for those with doctorate level degrees 3.4 per cent. The employment situation among the persons with the highest level of education was the best for those with degrees in medical and health sciences. Only one per cent of them were unemployed. The holders of degrees in humanities and arts, in turn, found it most difficult to become employed. Their unemployment rate was 6.6 per cent.

Appendix figure 6. Persons with doctorate level and higher level tertiary degree education as a percentage by the field of science in 2011



Forty per cent of the completers of higher or doctorate level education had degrees in social sciences. The large proportion of social sciences is explained by the fact that in addition to actual social sciences, this main group also includes education, law and business. The next largest groups of the highly educated population were found in both humanities and arts, and technology. Those with doctorate level degrees distribute more evenly across the fields of science. The fields of social, medical and health, and natural sciences each had around one-fifth of the persons with doctorate level degrees.

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Source: Human resources of science and technology 2012. Statistics Finland