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# **Employment analysis of PhD graduates from the University of Copenhagen 2008-2017**

Based on registry data from Statistics Denmark

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# 1 PhD graduates from the University of Copenhagen

With the 2006<sup>1</sup>Globalisation Agreement, Danish universities entered into an agreement with the Ministry of Higher Education and Science to boost the national research capacity in order to deliver on the goal of bringing public-sector research in Denmark in both quantity and quality to a level that would measure with the best in the world. This capacity building was, among other things, to result from a doubling of the 2010 PhD intake.

For the University of Copenhagen, this meant an increase from 435 PhD students in 2006 to a minimum of 870 in 2010 – a target the University exceeded by 63. In the six years from 2011 to 2016, the University's PhD intake varied across an average of 854 PhD students. Due to cutbacks at UCPH in 2016, the intake was reduced from 2016, where savings of DKK 105 million in the PhD area were to be realised up until 2018.

## Purpose of survey

The focal points of this PhD graduate survey are the following:

- Where do the University's PhDs find employment? In which industries or sectors are they employed and in which types of job?
- How long does it take from PhD graduation to the first job?
- What are PhDs paid in their first job?
- How many international PhDs from UCPH have stayed in Denmark, and how many left the country within the first year?
- How many Danish PhDs from UCPH have gone abroad, and how many have returned to Denmark within the first year?

In this graduate survey, most of the graphs are divided into Danish and international graduates. This is because almost 40% of the group of international students were listed as "not an employee" in many of the extracts we received from Statistics Denmark (DST). This is not solely because the international graduates are unemployed, it is also because DST cannot find the international graduates in their databases, either because they have left the country without informing the authorities or because they, for other reasons, are not found in the extracts focused on.

The survey is based on data extracts from Statistics Denmark in the years 2008-2016. Data from before 2008 is not of a comparable quality. 2017 is the latest available year because the data extract concerns PhDs who graduated in 2017 and up to one year after graduation, i.e. until the end of 2018.

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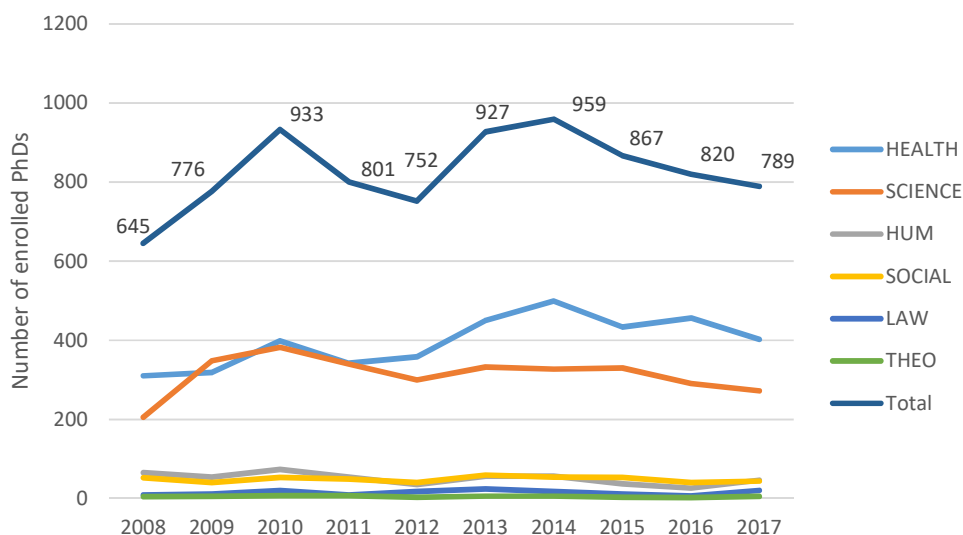
<sup>1</sup>The Agreement on the implementation of the globalisation funds was entered into on 2 November 2006 by the Liberal Party, the Conservative People's Party, the Social Democrats, the Danish People's Party and the Social Liberals.

Data has been aggregated in order to safeguard the individual graduate’s anonymity. A minimum of five individuals is required for a group before any information relating to employment is shown. For confidentiality purposes, employment data is not broken down on department level. However, each faculty report provides an overview of the number of graduates for each department. This version of the graduate survey also includes tables with only two time periods (2008-2012 and 2013-2017) also with regard to confidentiality.

As the populations from the Faculty of Law and the Faculty of Theology do not number the necessary five individuals in all years within the time frame, the Faculty of Theology has been combined with the Faculty of Humanities, and the Faculty of Law has been combined with the Faculty of Social Sciences when accounting for place of employment and conditions of employment. The Biotech Research and Innovation Centre (BRIC) has been combined with the Faculty of Health and Medical Sciences.

Chart 1 shows the development in the number of Danish and international PhD students enrolled in the period 2008-2017. As can be seen from the graph, the number of PhD students enrolled declined from 2014-2017, which, among other things, was a result of an Executive Board decision in 2013 to adjust the target figure from 930 to 820.

**Chart 1: Development in the number of enrolments of Danish and international PhD Students 2008-2017**



Source: UCPH PhD administration system, Fønix. NB: 2009 - 2015 follow the calendar year, previous years follow the academic year. LIFE and FARMA were individual faculties from 2007 to 2011, but has been merged with SCIENCE and HEALTH. Growth in enrolments are particularly evident in 2009 and 2010, as will be reflected in graduations in 2013 and 2014.

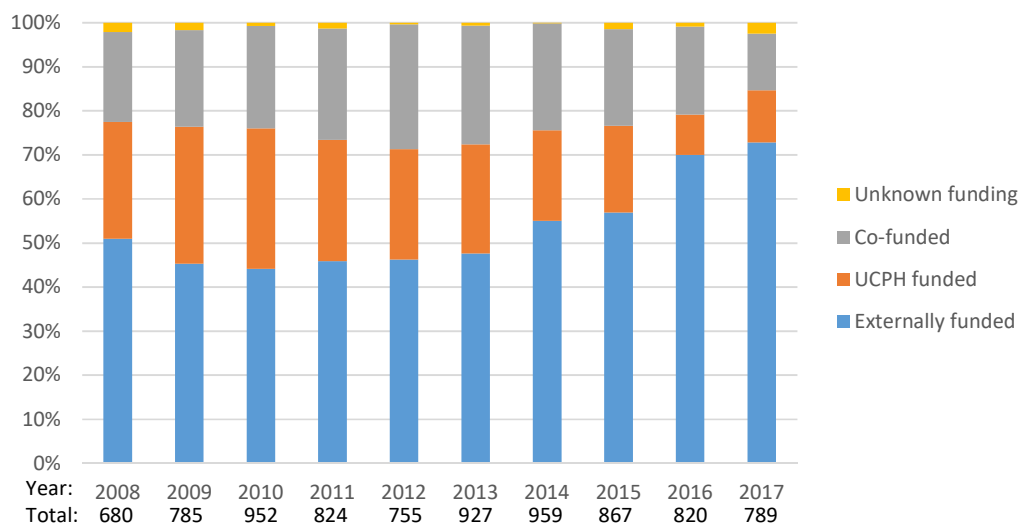
**Table 1: Development in the number of enrolments of Danish and international PhD Students 2008-2017**

|              | 2008       | 2009       | 2010       | 2011       | 2012       | 2013       | 2014       | 2015       | 2016       | 2017       |
|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| HEALTH       | 310        | 318        | 398        | 342        | 358        | 450        | 499        | 433        | 456        | 402        |
| SCIENCE      | 205        | 348        | 382        | 340        | 299        | 332        | 327        | 330        | 290        | 272        |
| HUM          | 65         | 54         | 73         | 54         | 35         | 56         | 56         | 37         | 26         | 46         |
| SOCIAL       | 52         | 40         | 53         | 49         | 40         | 59         | 54         | 53         | 40         | 44         |
| LAW          | 9          | 11         | 20         | 9          | 17         | 24         | 17         | 11         | 6          | 20         |
| THEO         | 4          | 5          | 7          | 7          | 3          | 6          | 6          | 3          | 2          | 5          |
| <b>Total</b> | <b>645</b> | <b>776</b> | <b>933</b> | <b>801</b> | <b>752</b> | <b>927</b> | <b>959</b> | <b>867</b> | <b>820</b> | <b>789</b> |

Source: UCPH PhD administration system, Fønix d. 25.09.18.

From 2008 to 2017, there was a development towards more and more PhD projects being externally funded. 51% was externally funded in 2008, with 73% in 2017.

**Chart 2: Funding of enrolled PhD students 2008-2017**



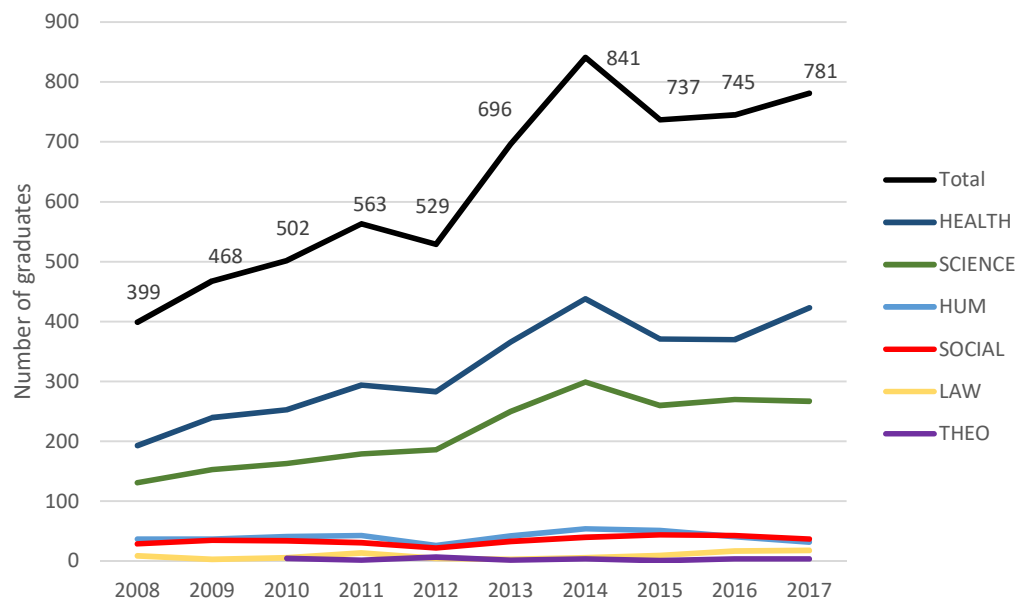
Source: UCPH PhD administration system, Fønix d. 10.02.20<sup>2</sup>

<sup>2</sup> There is a discrepancy between the total number of enrolled PhD students (Figure 1) and total funding of enrolled PhD students (Figure 2). The reason is that external funding may comprise several external funding sources, which is why the total in Figure 2 is higher than in Figure 1.

## 1.1 Development in PhD degrees awarded by UCPH in 2008-2017

As a consequence of the increased intake as indicated in the introduction, there was an increase in the number of degrees awarded by UCPH. The increase in 2013 and 2014 was a result of the mergers of SCIENCE and SUND with LIFE and FARMA, respectively.

Chart 3: PhDs awarded by faculty in in 2008-2017



Source: Statistics Denmark, November 2019

## 1.2 Employment rate for UCPH PhD graduates

The numbers for graduates' employment have been arrived at as follows: Graduates were first looked up in Statistics Denmark's employee register. If they were not found to be registered as employees within the first year of graduation, it was investigated whether they were registered as persons receiving public benefits. Failing that, they were looked up in the CVR register. Failing that, it was investigated whether they were registered as emigrants. Failing that, they were marked "Unknown."

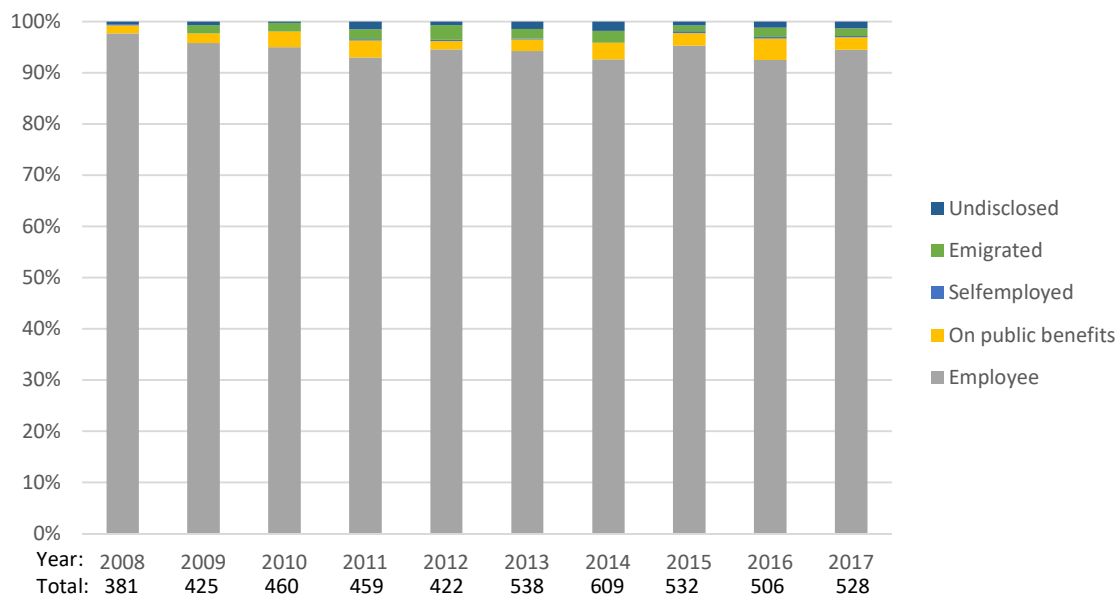
Charts 4 and 5 show the employment rate. In 2017, there were 45 Danish and international graduates registered as "on public benefits," corresponding to 4% of the year group. This group of graduates mainly consists of unemployment benefit recipients, but there is also a small number of sickness and maternity/paternity benefit recipients as well as people on holiday allowance or attending upgrading courses/continuing education. This means

that PhD unemployment is in line with the general unemployment for academics within 2-4 years of graduation<sup>3</sup>.

It is estimated that "Undisclosed" largely covers emigrants who have not registered their exit with the National Registration Office.

In the period 2008-2017, an average 95% of Danish PhD graduates were employees. Of the international graduates, an average 61% were employees in the period 2008-2016. The rate of emigrated Danes was at a stable level of about 2% during the entire period. For the international graduates there was a slight decrease from 22% in 2008 to 17% in 2017.

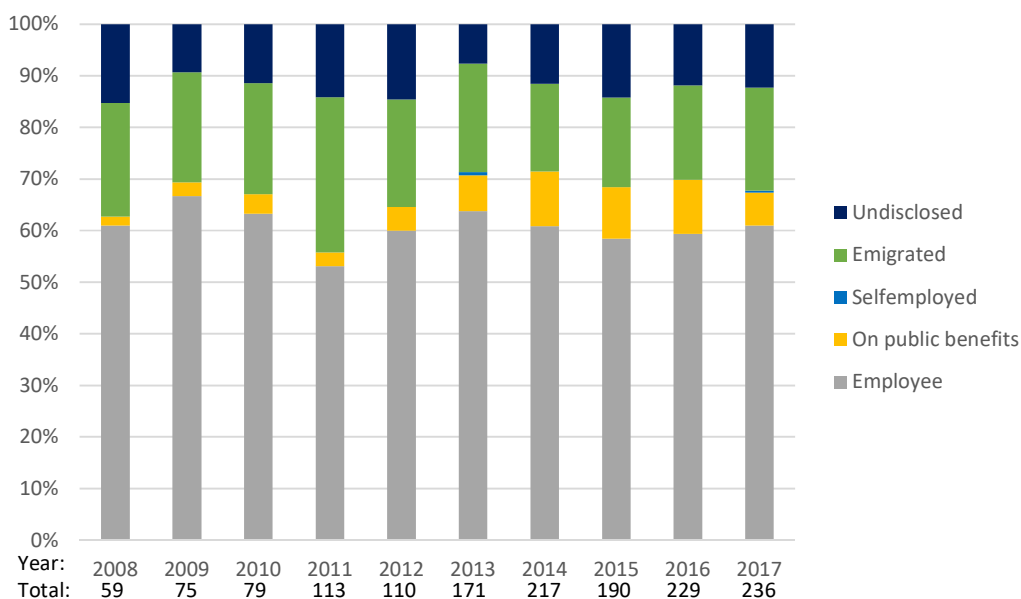
**Chart 4: Employment rate for Danish UCPH graduates 2008-2017, percent**



Source: Statistics Denmark, November 2019

<sup>3</sup>Data taken from the Confederation of Professional Associations' own statistics (time series and figures) dated 10 August 2017: <http://www.ac.dk/politik/beskaeftigelse-og-arbejdsmarked/akademikernes-ledighedsstatistik/tidsserier-og-sommerdimittender.aspx> (in Danish)

**Chart 5: Employment rate for international UCPH graduates 2008-2017, percent**



Source: Statistics Denmark, November 2019

**Table 2: Employment rate one year after graduation 2008-2017, number**

|                           | 2008       | 2009       | 2010       | 2011       | 2012       | 2013       | 2014       | 2015       | 2016       | 2017       |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <b>Employee</b>           |            |            |            |            |            |            |            |            |            |            |
| Danish                    | 372        | 407        | 437        | 427        | 399        | 507        | 564        | 507        | 468        | 499        |
| International             | 36         | 50         | 50         | 60         | 66         | 109        | 132        | 111        | 136        | 144        |
| <b>On public benefits</b> |            |            |            |            |            |            |            |            |            |            |
| Danish                    | 6          | 8          | 14         | 15         | 7          | 12         | 20         | 13         | 21         | 13         |
| International             | 1          | 2          | 3          | 3          | 5          | 12         | 23         | 19         | 24         | 15         |
| <b>Self Employed</b>      |            |            |            |            |            |            |            |            |            |            |
| Danish                    | 1          |            |            | 1          | 1          | 1          |            | 2          | 2          | 1          |
| International             |            |            |            |            |            | 1          |            |            |            | 1          |
| <b>Emigrated</b>          |            |            |            |            |            |            |            |            |            |            |
| Danish                    |            | 7          | 8          | 9          | 12         | 10         | 14         | 6          | 9          | 8          |
| International             | 13         | 16         | 17         | 34         | 23         | 36         | 37         | 33         | 42         | 47         |
| <b>Undisclosed</b>        |            |            |            |            |            |            |            |            |            |            |
| Danish                    | 2          | 3          | 1          | 7          | 3          | 8          | 11         | 4          | 6          | 7          |
| International             | 9          | 7          | 9          | 16         | 16         | 13         |            | 27         | 27         | 29         |
| <b>Total</b>              | <b>440</b> | <b>500</b> | <b>539</b> | <b>572</b> | <b>532</b> | <b>709</b> | <b>826</b> | <b>722</b> | <b>735</b> | <b>764</b> |

Source: Statistics Denmark, November 2019

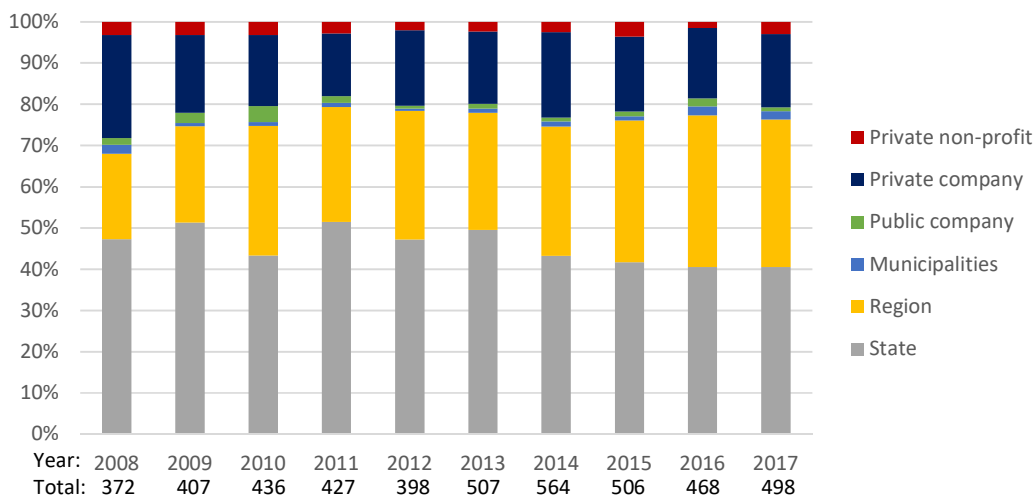


### 1.3 Sectoral breakdown for UCPH graduates' first job

Charts 6 and 7 show that 72% of Danish PhD graduates found their first job in the state sector and in the regions. International PhDs mainly found their first job in the state sector and in the private sector (55%).

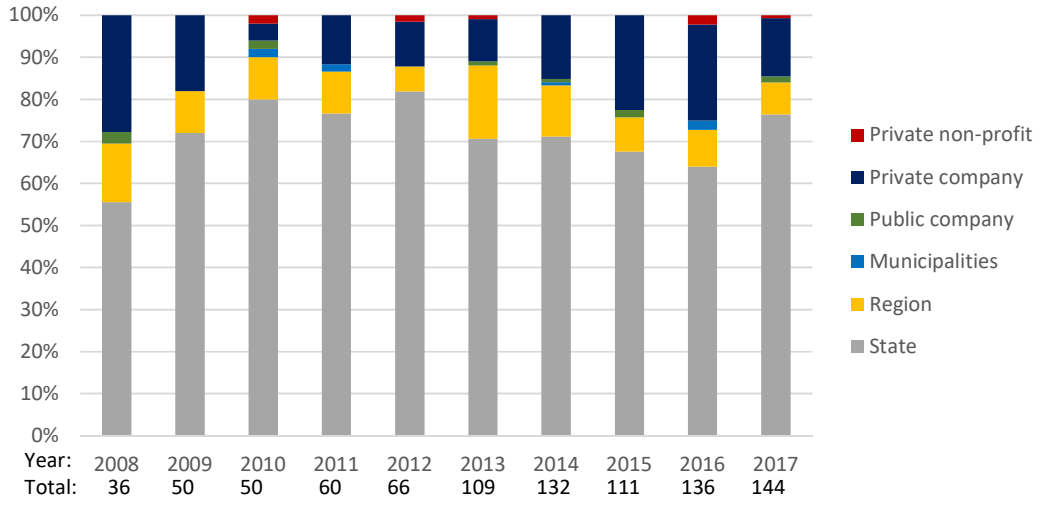
Charts 6 and 7 can be compared with Charts 15 and 16 (employee full-time/part-time), which show a strong tendency for part-time positions as PhD graduates' first job. The sectoral breakdown held against employment type indicates that a significant proportion of PhDs start their career as an employee, either in ordinary medical jobs at hospitals or in part-time positions at the University, most likely either to finalise an attachment formed during the PhD phase or to maintain an attachment until a more permanent employment opportunity arises.

**Chart 6: Sectoral breakdown for Danish employees in their first job 2008-2017, percent**



Source: Statistics Denmark, November 2019

**Chart 7: Sectoral breakdown for International employees in their first job 2008-2017, percent**

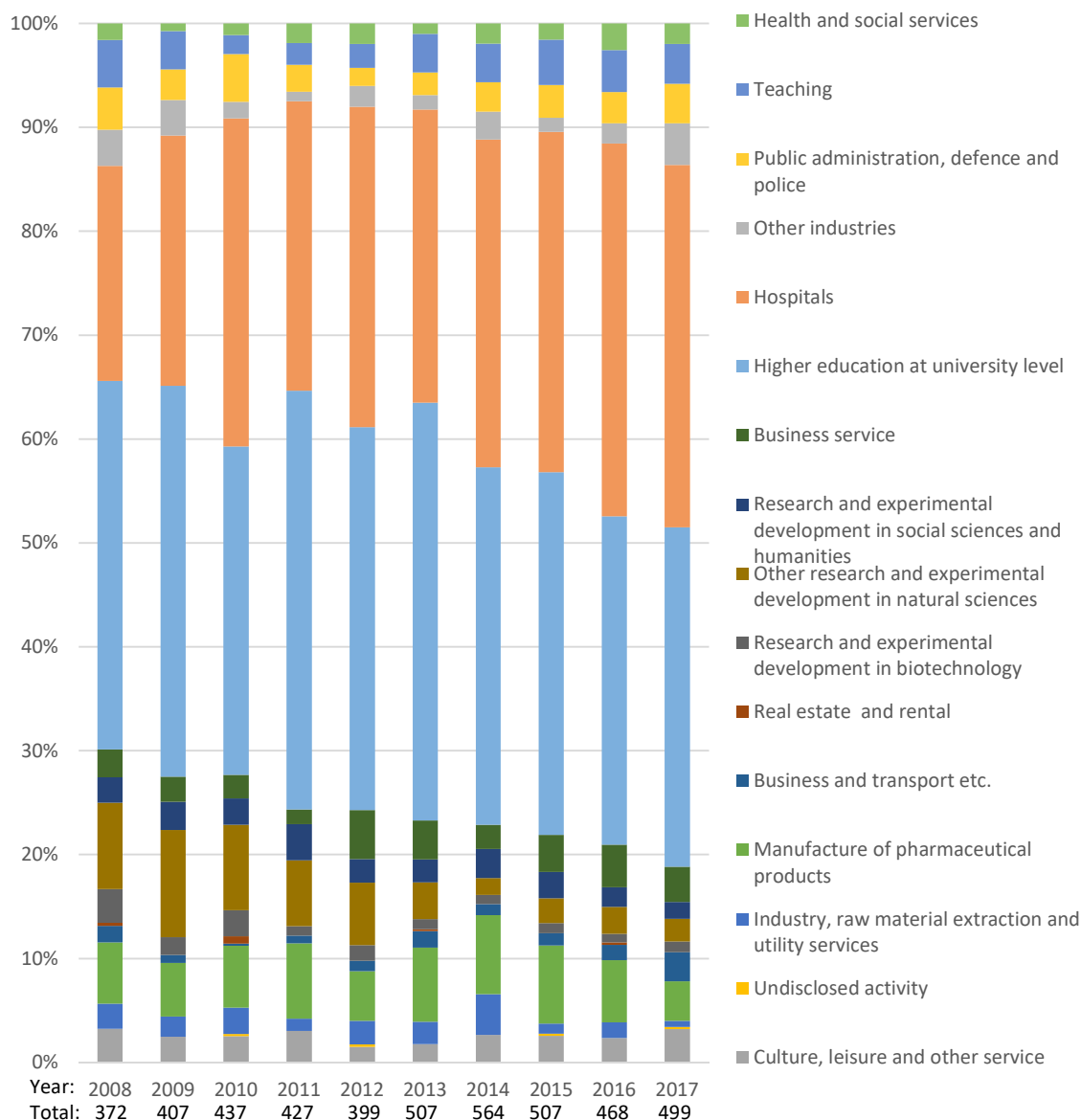


Source: Statistics Denmark, November 2019

## 1.4 Industry breakdown for UCPH PhD graduates' first job

In terms of industry breakdown among Danish PhD graduates from UCPH, the largest groups are "higher education at university level" (31%) and "hospitals" (33%)<sup>4</sup>.

**Chart 8: Industry breakdown for Danish employees in their first job 2008-2017, percent**

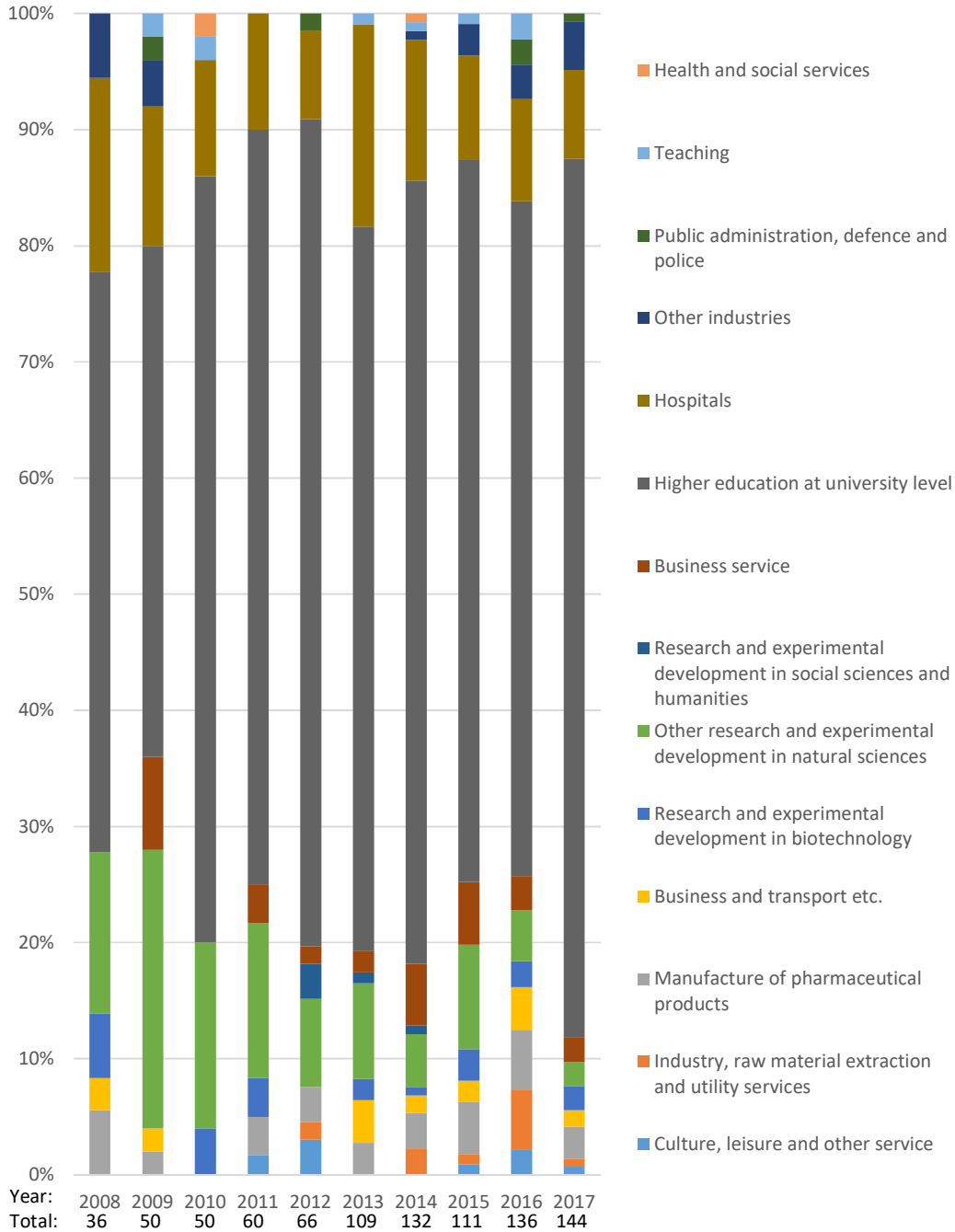


Source: Statistics Denmark, November 2019

<sup>4</sup> Employees are distributed according to the industry classification Danish Industry Code 2007. The institutions do their own reporting to Statistics Denmark and decide themselves to which industries they belong.

Across 2008-2017, around 46% of the international graduates who are registered as employees found work within “higher education at university level.”

**Chart 9: Industry breakdown for International employees in their first job 2008-2017, percent**

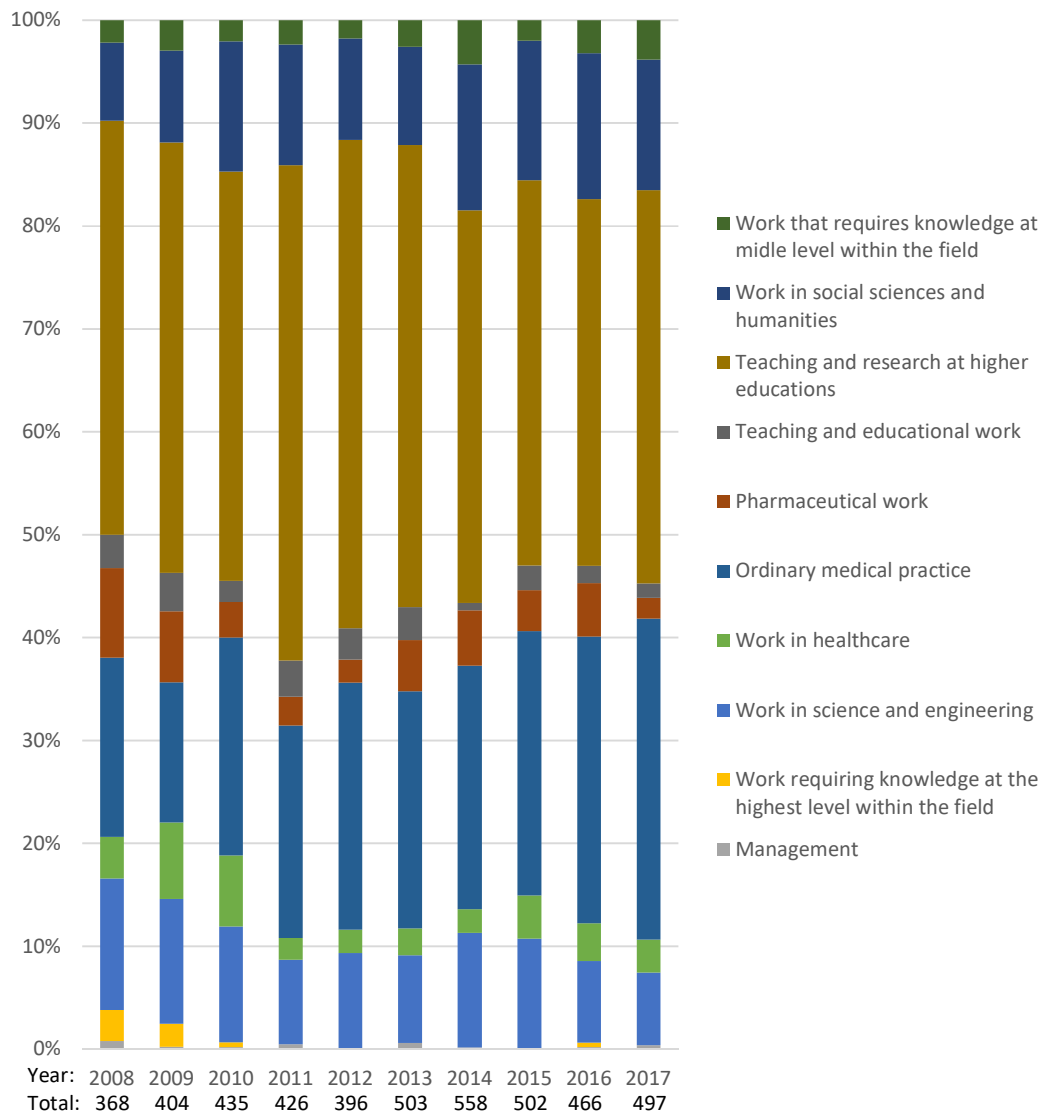


Source: Statistics Denmark, November 2019

## 1.5 Job functions performed by UCPH PhD graduates in their first job

In the period 2008-2017, an average 64% of the Danish PhD graduates were employed in teaching and research at higher education programmes and in general medical work<sup>5</sup>.

**Chart 10: Jobfunctions for Danish employees in their first job 2008-2017, percent**



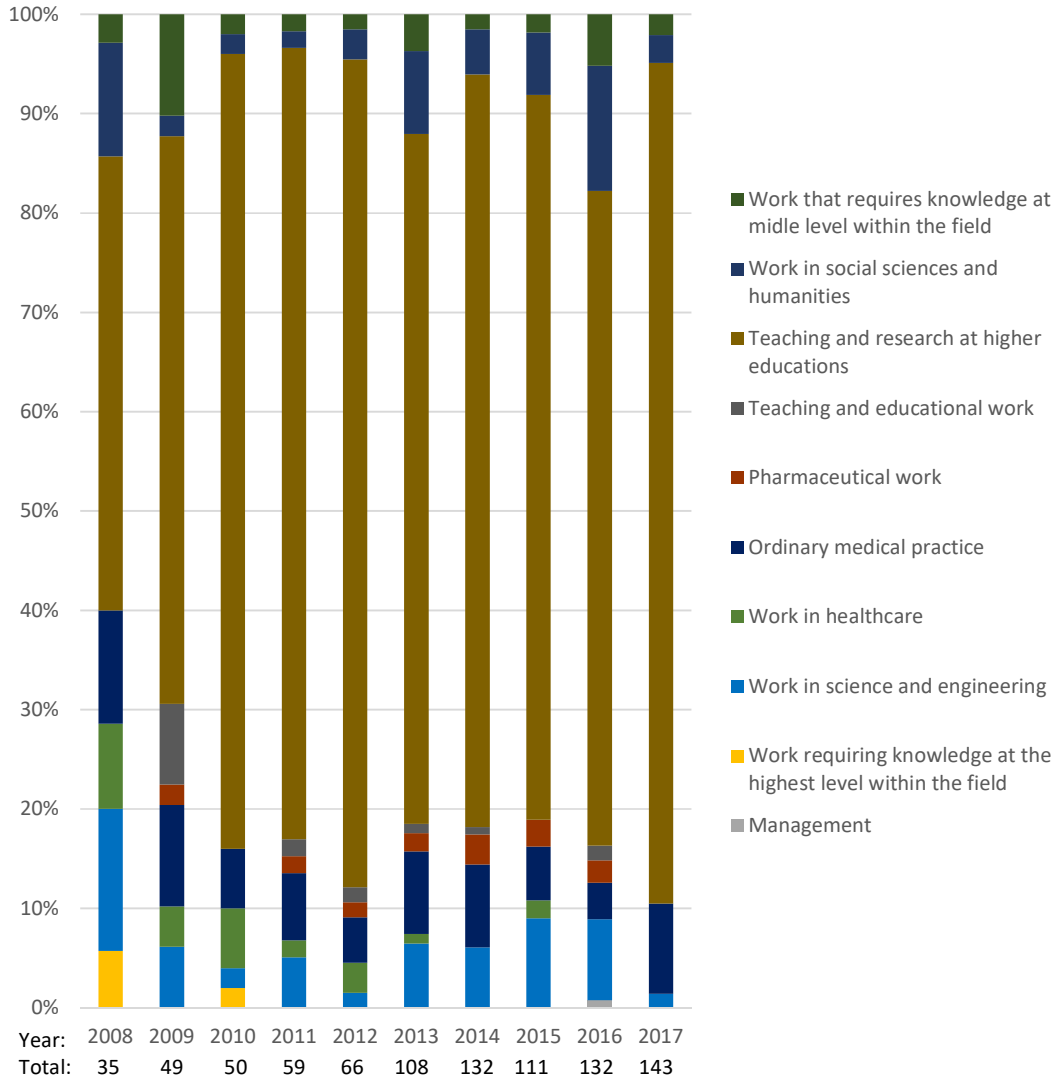
<sup>5</sup> Employees are distributed by the categories in the Danish version of the International Standard Classification of Occupations (DISCO-08). The employers report the job functions of their employees. The reason for the large proportion of "general medical work" is because SUND has the highest proportion of PhD graduates, and the majority of these graduates (31%) are within the group of "general medical work".

The group of "not employed" are not enclosed in this chart, the total is therefor smaller than in chart 8-10

Source: Statistics Denmark, November 2019

**Chart 11: Jobfunctions for international employees in their first job 2008-2017, percent**

In the period 2008-2017, an average 71% of the international PhD graduates registered as employees were occupied in teaching and research at higher education programmes<sup>6</sup>.



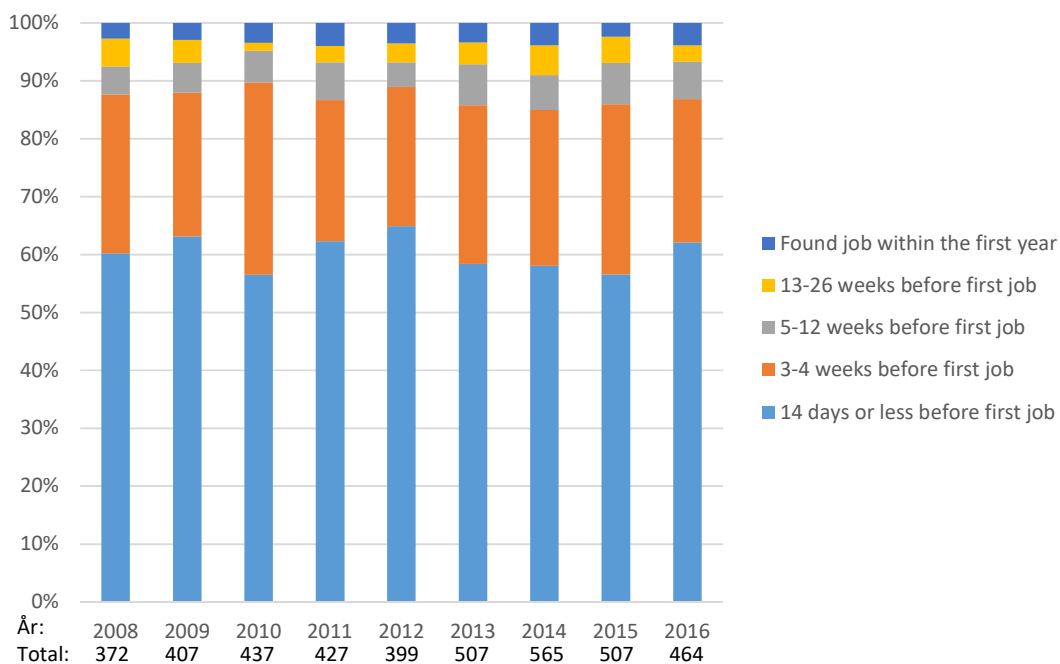
Source: Statistics Denmark, November 2019

<sup>6</sup> The group of "not employed" are not enclosed in this chart, the total is therefor smaller than in chart 8-10

## 1.6 Unemployment among UCPH PhD graduates 2008-2017

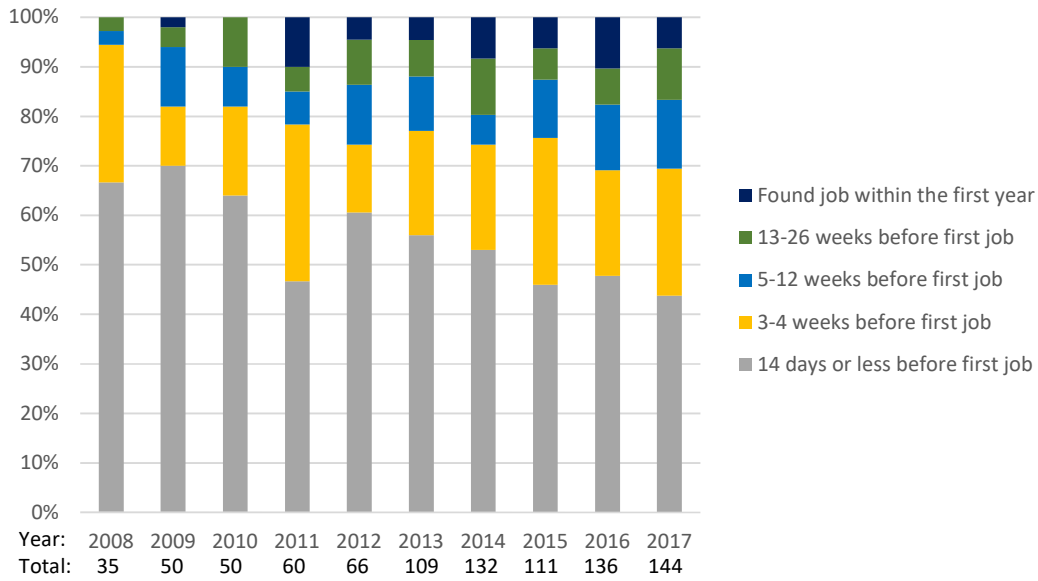
In 2017, 84% of Danish PhD graduates registered as employees found work within the first month of graduation. The same goes for 69% of the international PhD graduates registered as employees. After six months, the chart was 97% for the Danish employees and 94% for the international employees.

**Chart 12: Unemployment among Danish employees 2008-2017, percent**



Source: Statistics Denmark, November 2019

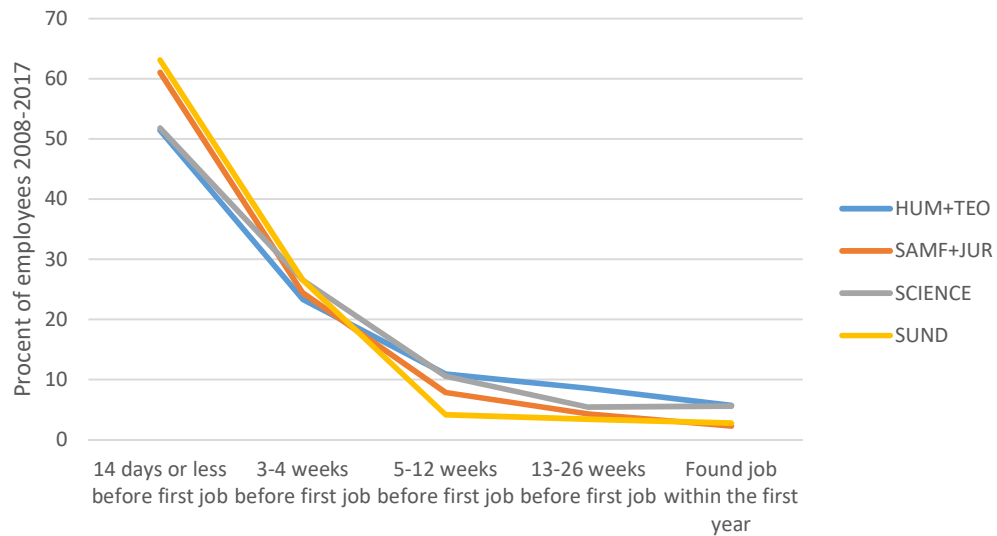
**Chart 13: Unemployment among international graduates 2008-2017, percent**



Source: Statistics Denmark, November 2019

If the period of unemployment is broken down by faculty rather than years, it turns out that graduates (Danish and international) from SUND and SOC.SCI + LAW generally found work a little sooner than graduates from SCIENCE and HUM + THEO, but generally the faculties followed the same trend.

**Chart 14: Time before first employment by faculty for Danish and international graduates of 2008-2017, percent**



Source: Statistics Denmark, November 2019

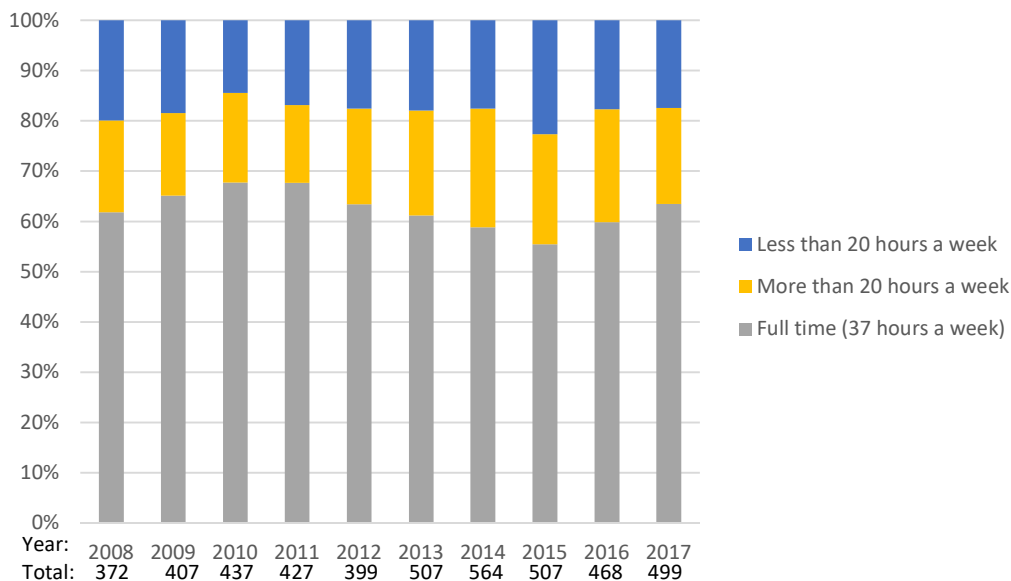


## 1.7 Type of employment for UCPH PhD graduates 2008-2017

The data set shows how many hours a week graduates were employed in their first job, but does not show whether it was fixed-term or permanent employment.

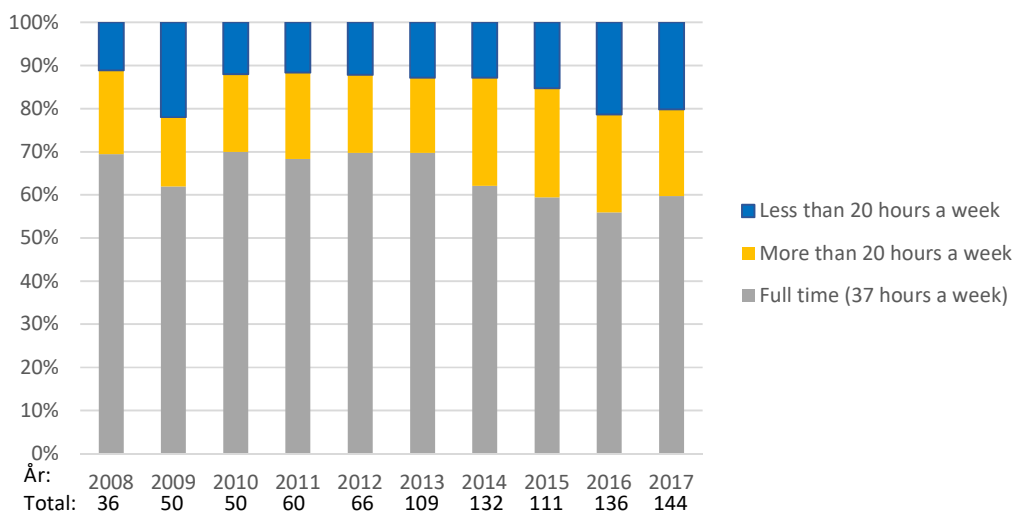
It must be kept in mind that this is the first job, and that part-time positions may be due to an association with the University, such as research assistant or assistant lecturer until a more permanent job opportunity arises. It should be noted that this tendency could also affect the relatively high number of graduates who found their first job at the University, see Charts 8 + 9.

**Chart 15: Type of employment for Danish UCPH graduates: full-time or part-time 2008-2017**



Source: Statistics Denmark, November 2019

**Chart 16: Type of employment for international UCPH graduates: full-time or part-time 2008-2017**



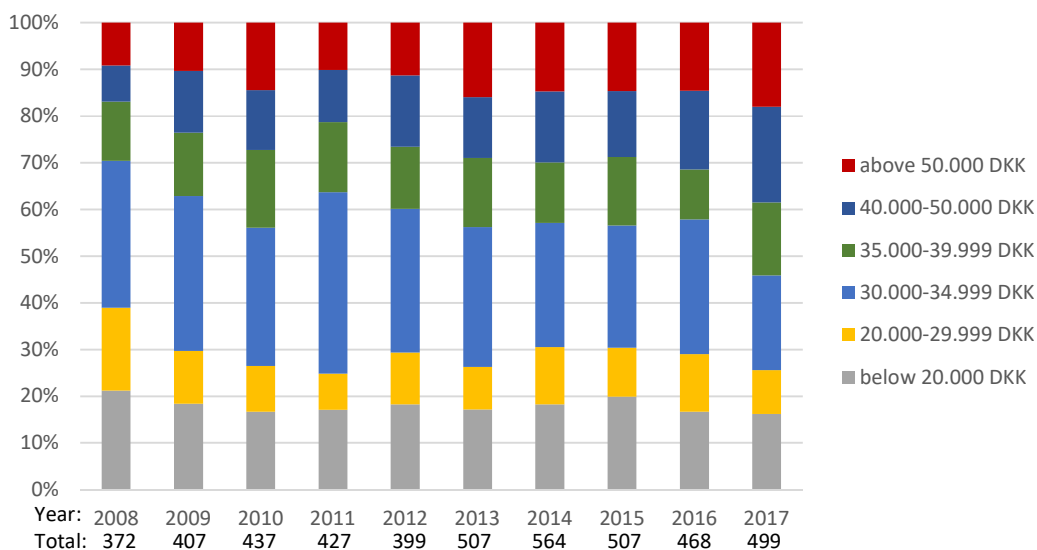
Source: Statistics Denmark, November 2019

## 1.8 Pay level for UCPH PhD graduates' first job

This survey has not extracted payroll data for graduates so a comparison is not possible. However, the think tank DEA has compared salaries among natural and health science PhD graduates in the private sector concluding that graduates within the first year of graduation are approximately 6% behind graduates with a corresponding work experience; but that five years later, they are 7% ahead of the same graduates (DEA, Job market after graduation for PhDs, December 2014).

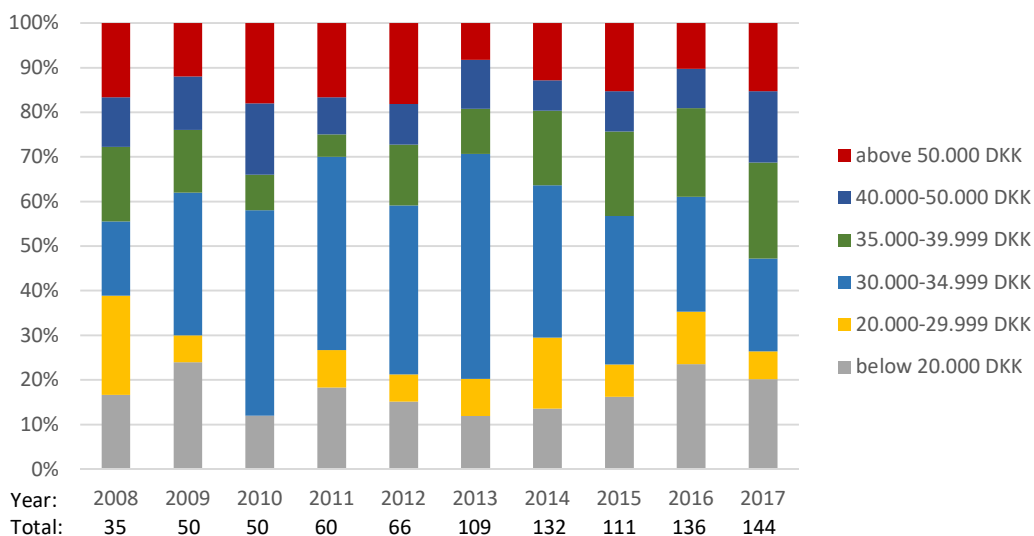
Looking at full-time graduates from the entire period, most of the Danish and international graduates were paid monthly salaries of DKK 30,000-35,000 (29% and 34%), respectively.

**Chart 17: Wage differentials for full-time Danish employees, percent (ex. pension) 2008-2017**



Source: Statistics Denmark, November 2019

**Chart 18: Wage differentials for full-time international employees, percent (ex. pension) 2008-2017**

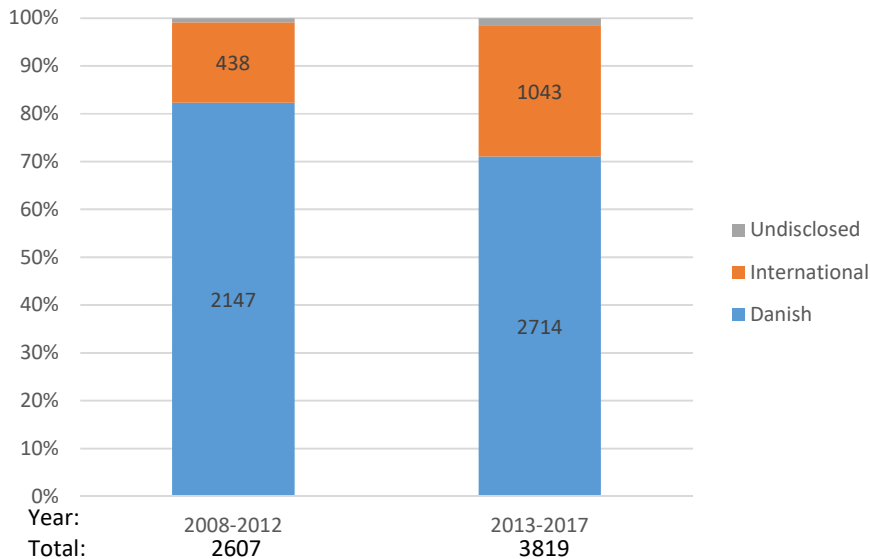


Source: Statistics Denmark, November 2019

## 1.9 UCPH PhD graduates outgoing and incoming

The proportion of international PhDs increased during the period, from 17% in the years 2008-2012 to 27% in the years 2013-2017.

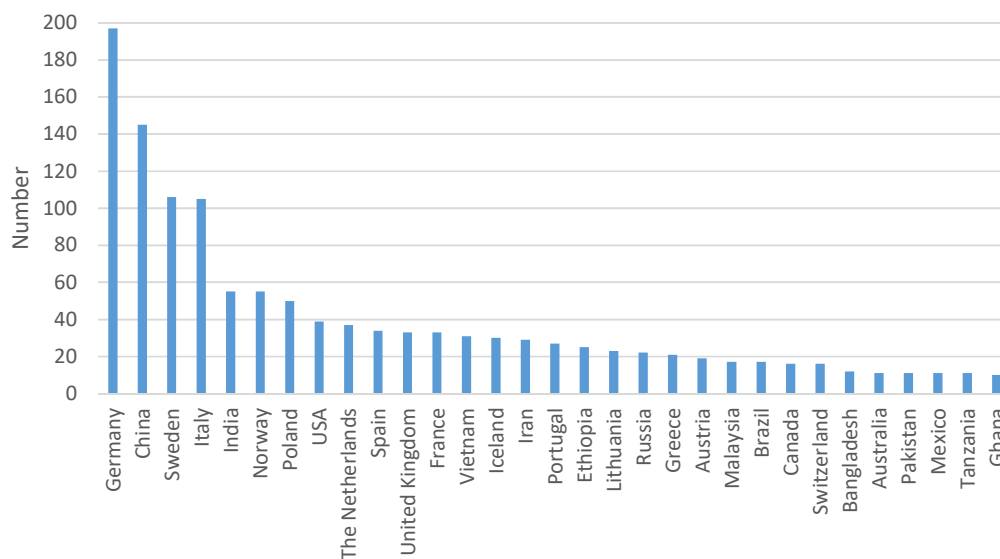
**Chart 19: Nationality 2008-2017, percent**



Source: Statistics Denmark, November 2019

The international PhDs held citizenships from 109 different countries, of which the most common were the following in the years 2008-2017.

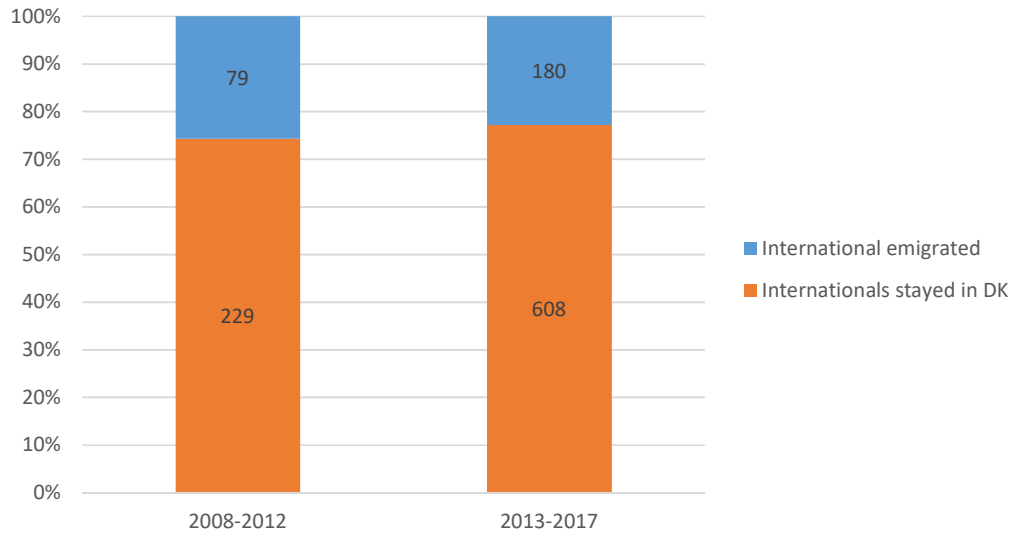
**Chart 20: Nationality of international graduates 2008-2017, number**



Source: Statistics Denmark, November 2019

In 2008-2012 26% of the international graduates emigrated from Denmark within the first year. In the 2013-2017 23% of the international graduates emigrated from Denmark within the first year.

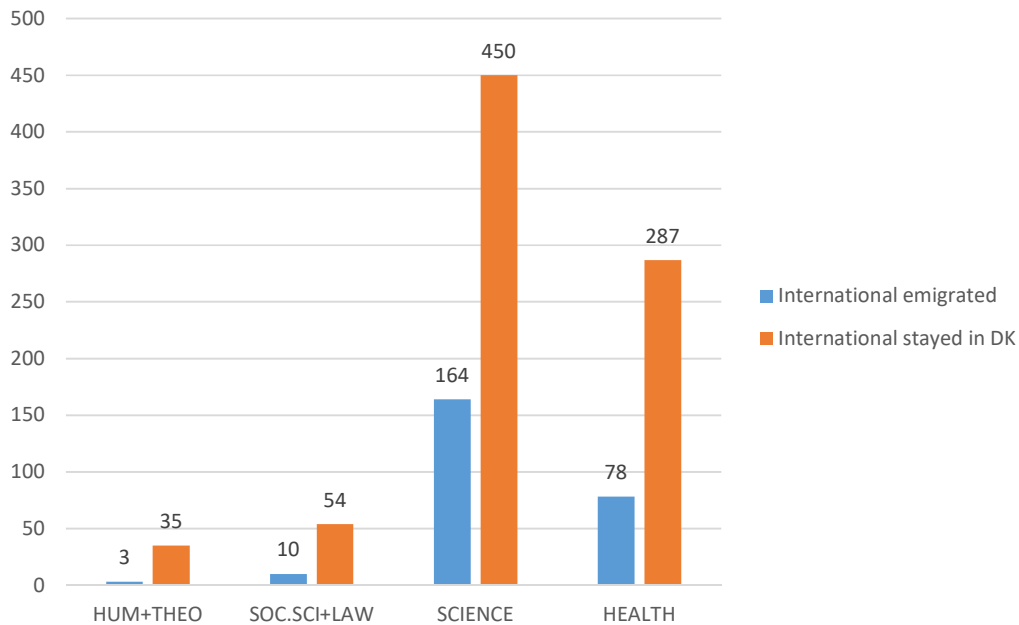
**Chart 21: International PhD graduates' movements in the first year, 2008-2012+2013-2017, percent**



Source: Statistics Denmark, November 2019

Chart 22 shows that the majority of UCPH graduates were from SCIENCE and HEALTH.

**Chart 22: International PhD graduates emigration by faculty 2008-2017, number**



Source: Statistics Denmark, November 2019

**Tabel 23: Percent of Danish and international PhD graduates 2008-2017, percent**

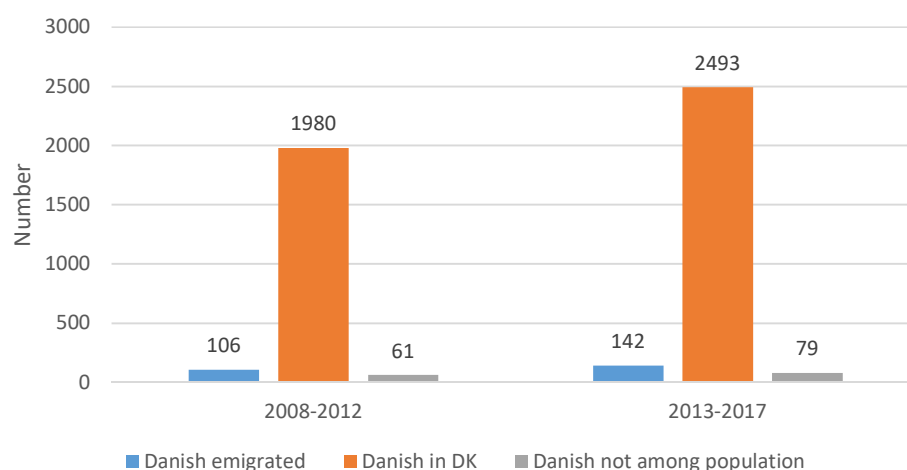
|                      | SCIENCE     | HEALTH      | HUM+THEO    | SOC.SCI+LAW |
|----------------------|-------------|-------------|-------------|-------------|
| <b>Danmark</b>       | 60%         | 84%         | 87%         | 85%         |
| <b>International</b> | 38%         | 15%         | 13%         | 15%         |
| <b>Undisclosed</b>   | 3%          | 1%          | 0%          | 0%          |
| <b>Total</b>         | <b>100%</b> | <b>100%</b> | <b>100%</b> | <b>100%</b> |

Source: Statistics Denmark, November 2019

### 1.10 Danish PhDs' international mobility

For the entire period of 2008-2016, an average 5% of the Danish PhDs went abroad within the first year of graduation<sup>7</sup>.

**Chart 24: Danish PhDs' international mobility 2008-2012 + 2013-2017**



Source: Statistics Denmark, November 2019

<sup>7</sup> Statistics regarding emigrations for Danish and international graduates are subject to uncertainty. The reason is that those who emigrate do not always report it, and there can be a delay in the actual registration of their emigration.

Statistics Denmark is operating with three categories when it comes to emigrations within the first year after graduation:

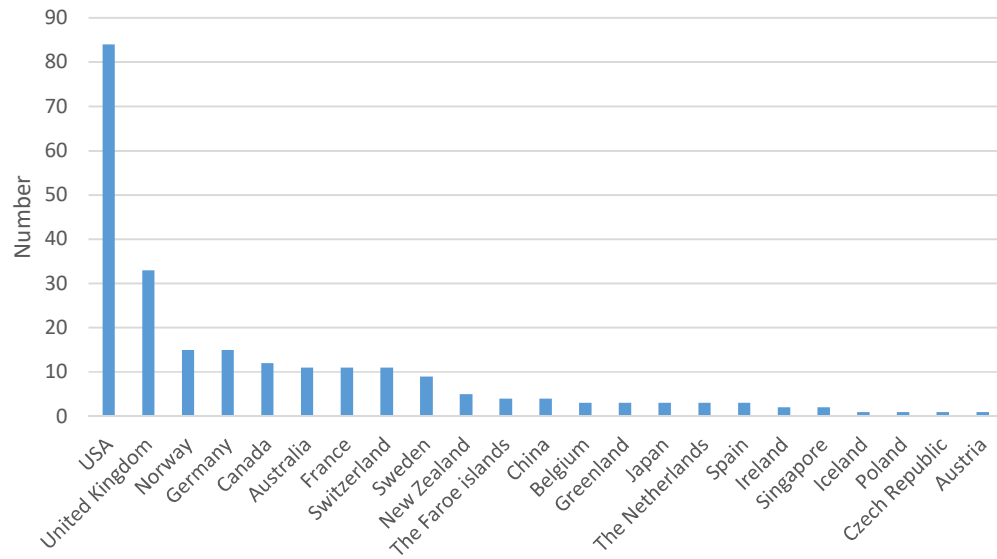
1: "Emigrated" means that the person only has an emigration date, persons who have a date of return before emigration date, persons who have emigrated -> returned and then emigrated.

2: "among population (in DK)" means persons who only have a re-entry date, persons who have returned, who are not in Statistics Denmark's register, but who are among population in the nearest quarter after the first year of graduation.

3: "Not among population" means that the persons are only within the population register before the end of the first year after graduation, only in the population register after the nearest quarter after the first year after graduation, are not to be found before or after the end of the first year after graduation.

The following countries were the most frequent destinations for outgoing PhDs from UCPH holding Danish nationality.

**Chart 25: Most frequent destinations for outgoing PhDs from UCPH holding Danish nationality 2008-2017**



Source: Statistics Denmark, November 2019

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