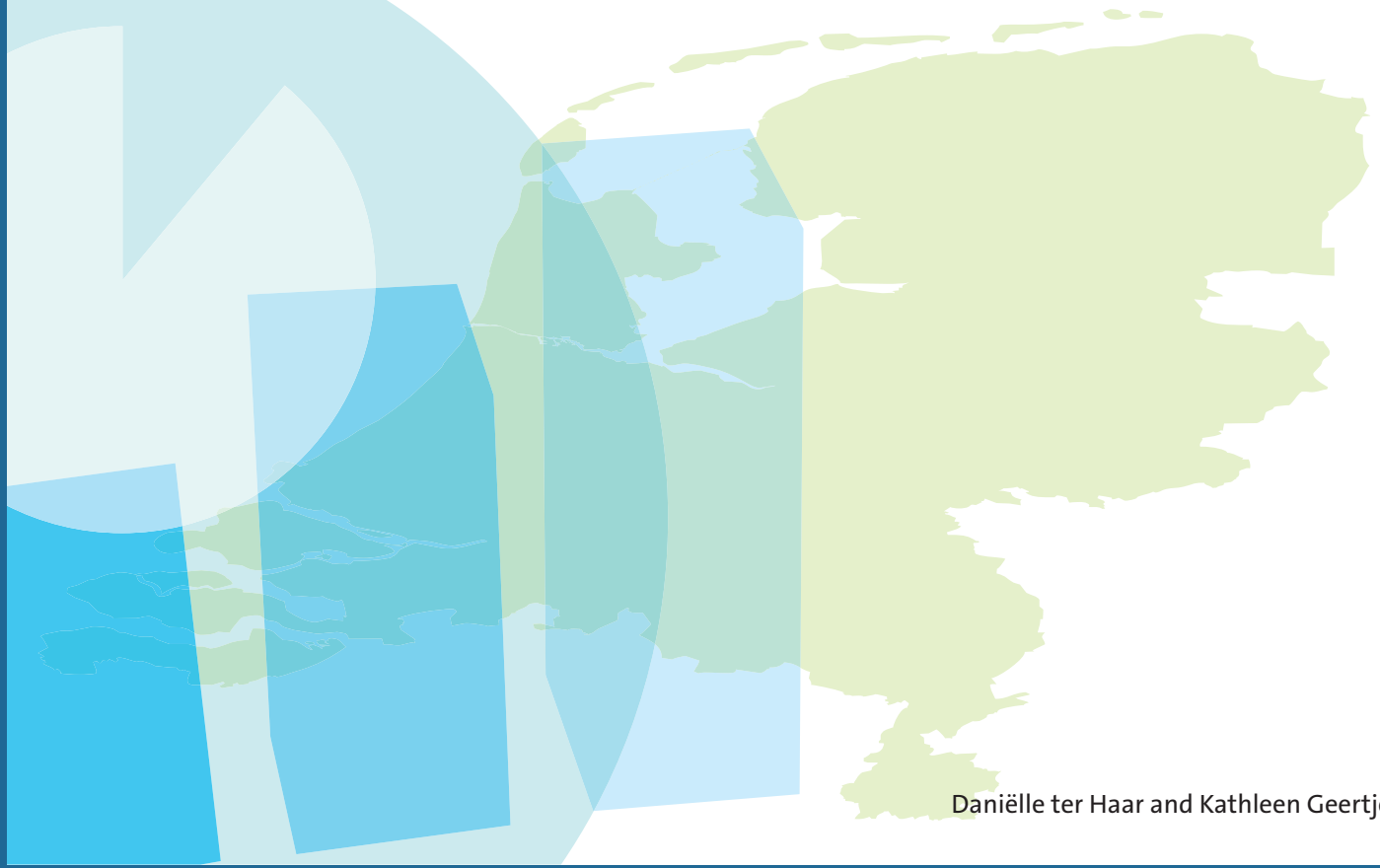
Careers of Doctorate Holders 2007

09



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Centre for Policy Related Statistics

Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2007–2008	= 2007 to 2008 inclusive
2007/2008	= average of 2007 up to and including 2008
2007/'08	= crop year, financial year, school year etc. beginning in 2007 and ending in 2008
2005/'06–2007/'08	= crop year, financial year, etc. 2005/'06 to 2007/'08 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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1 Introduction

The Dutch Ministry of Education, Culture and Science has asked Statistics Netherlands to update ten tables for the international Survey on Careers of Doctorate Holders (CDH).

The CDH is a joint project carried out by the Organisation for Economic Development and Cooperation (OECD), the Statistical Office of the European Commission (Eurostat) and UNESCO Institute for Statistics (UIS). Collecting information on doctorate holders is important, because they are considered to be crucial to the production, application and diffusion of knowledge in an international and national context. The objective of the project is to collect the most recent statistics on educational history, work experience and international mobility of doctorate holders throughout the world. Every country is asked to collect information on doctorate holders in their country. At the moment, participation in the project is voluntary. The ultimate goal is to cover the total population of doctorate holders worldwide.

In October 2007 Statistics Netherlands' Centre for Policy Statistics studied the possibilities of completing the 32 pre-defined tables for the CDH using information available at Statistics Netherlands. We were able to fill 17 of the 32 tables and presented them in the report "Careers of Doctorate Holders 2005, Feasibility study and first results".

The updated tables contain demographic information (so-called P tables) and information on inward mobility (IMOB tables). See figure 1 for an overview of these tables. The situation of the doctorate holders has been determined on 31 December 2007.

Figure 1. Overview of the tables

Number	Title
P1	Number of doctorate holders by sex and age class
P2[1]	Number of doctorate holders by type of citizenship and country of birth
P3	Number of doctorate holders by sex and country of citizenship
P4[1]	Number of doctorate holders by citizenship and age class
P5[1]	Number of doctorate holders by citizenship and field of doctorate degree
P6	Number of doctorate holders by sex and country of birth
P7[1]	Number of doctorate holders by country of birth and age class
P8[1]	Number of doctorate holders by country of birth and field of doctorate degree
IMOB1[1]	Number of doctorate holders by citizenship and length of stay in the country
IMOB2[1]	Number of doctorate holders by citizenship and previous country of residence

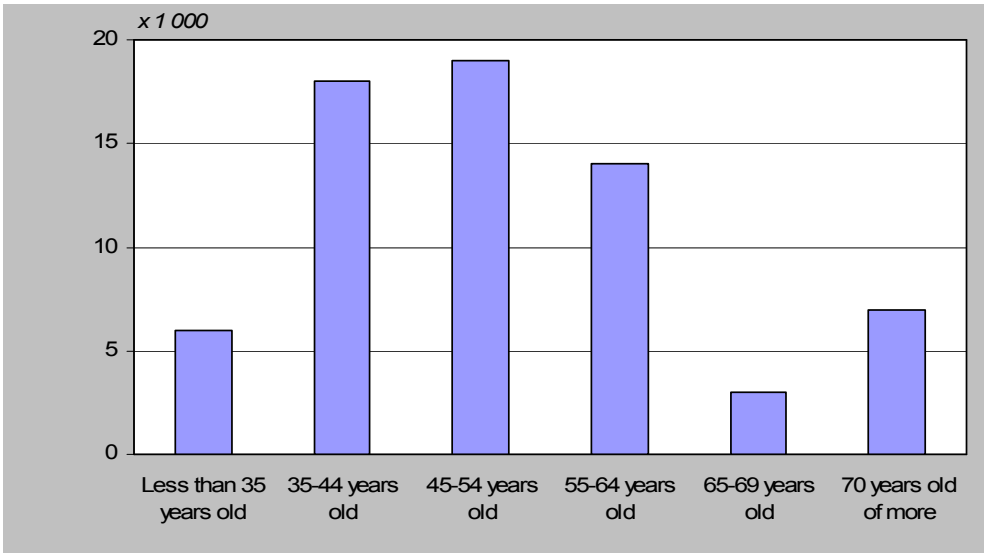
1) The tables deviate at some points from the requested tables. See chapter 3 "Quality of the results" for the differences.

Chapter 2 gives a summary of the results. Chapter 3 describes the research method and data sources. Chapter 4 gives an overview of the definitions and how they were operationalised to compute the tables. In chapter 5 a list of abbreviations and their Dutch translations is given.

2 Results

On 31 December 2007, 67 thousand people in the Netherlands had a doctorate[1]. More than a third (36 percent) were between 35 and 54 years old. One in ten doctorate holders were 70 years or older (7 thousand).

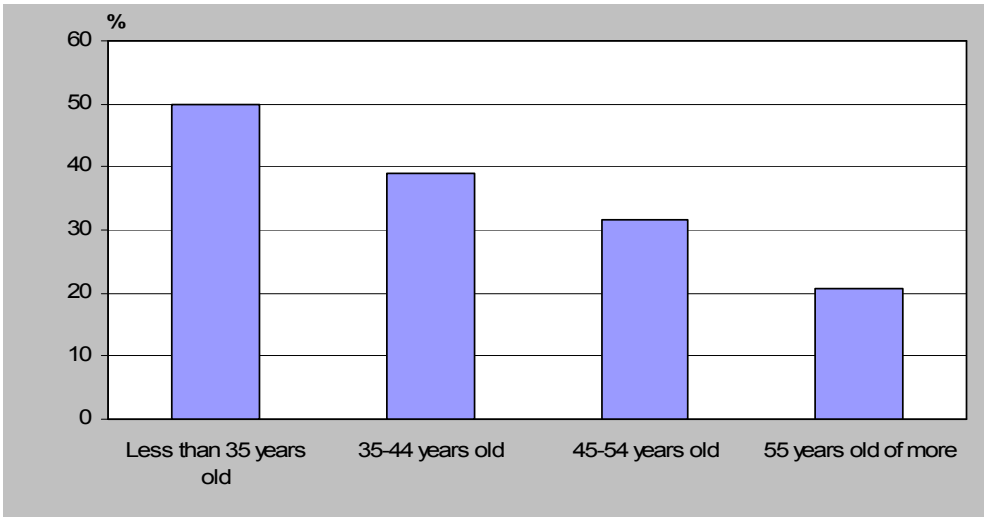
Figure 2. Doctorate holders by age class, 31 December 2007



More female doctorate holders

On average, one third of doctorate holders in the Netherlands are women. However, there is a clear age effect: one in two doctorate holders younger than 35 years are women compared with only one in five of those aged 55 and older.

Figure 3. Percentage of female doctorate holders by age class, ultimo 2007



[1] The results are not comparable with the results in "Careers of Doctorate Holders 2005". See chapter 3 section "Quality of the results" for an explanation.

3 Method and data sources

Target population

The target population of tables P1, P4 and P7 consists of all doctorate holders living in the Netherlands on 31 December 2007, excluding those living in institutions (institutional population). The target population of the remaining tables consists of all doctorate holdes *under 70 years of age*, living in the Netherlands on 31 December 2007, excluding those living in institutions.

Method

Data sources

The main data source is the Labour Force Survey (LFS).

The LFS is a year-round survey which covers the population aged 15 years and older resident in the Netherlands, excluding the institutional population. The survey collects data on some 120,000 respondents every year. This is the equivalent of 0.8 percent of the population of the Netherlands. The LFS asks mainly for information about previous and present education, employment situation and household characteristics.

The LFS is used to identify doctorate holders and to establish in which field they completed their degrees. All other information requested in the tables is taken from a register. Therefore, the LFS was extended with information on demographic characteristics (such as age, nationality and country of birth) from the Longitudinal Municipal Population Register (MPR-L). The Municipal Population Register (MPR) is a computerised population register used by all municipalities in the Netherlands to record vital events and migration. It was introduced on 1 October 1994. In principle, all persons living in a municipality are registered in the MPR. The register includes information on date of birth, gender, country of birth, address, household composition, immigration and emigration. The MPR-L is a longitudinal register, composed of all entries in the MPR from 1 January 1995. The MPR-L of 31 December 2007 is linked on a person-by-person basis to the LFS.

Identification method and weighting

The study determined the total number of doctorate holders resident in the Netherlands on 31 December 2007 with the so-called identification method. This is in contrast with the study “Careers of Doctorate Holders 2005, Feasibility study and first results”, where the average total of doctorate holders over the years 2004, 2005 and 2006 was determined (average method). The results of the two studies are not comparable, as the methods are quite different. The differences are explained in the section “Quality of the results” in chapter 3.

Series of LFS

The LFS is a sample survey, and as the number of doctorate holders in the Netherlands is quite small (roughly 70 thousand), the cell count in detailed classifications is too low to compute reliable results when using only one year of the LFS. As someone who has attained a doctorate remains a doctorate holder for the

rest of his/her life, it is possible to increase the sample survey of LFS 2007 with doctorate holders identified in LFS 2004, 2005 and 2006, thus reducing the margin of error and increasing the level on which it is possible to estimate reliable results. Overall in 2004, 2005, 2006 and 2007, there were 367,256 respondents to the LFS of whom 2,104 were doctorate holders living in the Netherlands on 31 December 2007.

Weighting the data

One doctorate holder in the sample survey of the LFS represents a group of doctorate holders with the same characteristics in the entire population of doctorate holders. To estimate the entire population weights must be used. In the LFS weights are available that ensure that the weighted population is consistent with the average number of persons aged 15 years and older in the Netherlands, excluding the institutional population (LFS weights). These LFS weights also partly correct for selective non-response. Normally, these LFS weights are used to calculate an average in a year. As in this study the total number of doctorate holders resident in the Netherlands on a reference date (31 December 2007) is calculated, the LFS weights must be adjusted.

The LFS weights in each year are adjusted in proportion to their sample size, in such a way that the new weights estimate the entire population of doctorate holders resident in the Netherlands on 31 December 2007. As the number of female doctorate holders increases every year, the ratio of male to female doctorate holders is taken into account.

Quality of the results

Statistics Netherlands completed the requested tables, with the exception of information on residential status. Information about residential status is not reliable because of the margin of error, which is explained further below. Information on citizen by birth is approached by information on the origin of doctorate holders (tables P2 and P3). In addition some categories had to be aggregated because the cell count was not sufficient.

Margin of error

As in every sample survey, the results are subject to a margin of error. Therefore, weighted totals based on 25 observations or fewer (equalling weighted totals around 1 thousand) are not published. The absolute totals in the tables are rounded to the nearest thousand. Calculating percentages on absolute totals smaller than 10 thousand must be done with care, as these percentages will have high margins of error.

Differences with previous study

Comparing the results of this study with the results of the feasibility study “Careers of Doctorate Holders 2005” the following must be taken into account:

- The identification method used in this study differs from the average method used in the feasibility study “Careers of Doctorate Holders 2005”. In the identification method, a series of years of the LFS is used to identify doctorate holders, and register information is used to determine the doctorate holders on a reference date and to determine their demographic

characteristics on the reference date. In the average method, a series of years of the LFS is also used, not only to identify whether respondents are doctorate holders, but also to determine their demographic identifications. In the average method average totals over the years are calculated. The identifcation method calculates more recent information about the doctorate holders, though as a consequence the results have larger margins of error.

- The identification method underestimates the number of immigrants. The average number of immigrants is represented by the sample survey, but because in this study a total is calculated for 31 December 2007, the number of immigrants is slightly underestimated, whereas the average method used in the study “Careers of Doctorate Holders 2005” overestimated the number of emigrants. The large difference in the number of doctorate holders under 45 years old in this report in comparison with the previous report can be partly explained by emigration. Young doctorate holders emigrate more often than older doctorate holders.
- Another difference between the two studies is the use of improved LFS weights in this study.

4 Definitions and operationalisation

This chapter presents the definitions used in computing the tables, and how they were operationalised. The definition is the definition as given in the CDH project. The operationalisation is how they were used in practice in this study. For each variable, the data source used the variables in the data source and the variables in the dataset used for this study are also described. Where applicable, differences between the definition as asked in the CDH project and the operationalisation in this study are noted.

Target population

The target population is defined using information from the LFS on highest completed level of education and information on the year the doctorate was awarded.

1. Doctorate holders 31 December 2007	
Tables	All
Source	LFS
Definition	Persons who have ISCED level 6 as their highest level of education
Operationalisation	Doctorate holders are all persons who: - have ISCED level 5 or 6 as their highest completed level of education, and - have stated that they have completed a doctorate, or have given information on academic education they have completed which is classified as a doctorate, and - the time elapsed between former attained educational degrees and the doctorate degree is consistent with the time to complete a doctorate. - are registered in the MPR-L ultimo 2007
Variable(s) in file	Doctorate holder
Classes in file	– yes – no
Remarks	As the level of education according to ISCED was not allocated correctly in the LFS for doctorate holders, the CDH definition could not be used. The definition was therefore operationalised as described, using several variables from the LFS, with the aim to approximate the CDH definition as close as possible.

Quality	Sufficient.

Demographic characteristics

Demographic information is taken from the MPR-L.

2. Gender	
Tables	P1, P3, P6
Source	MPR-L
Definition	Self-evident
Operationalisation	Self-evident
Variable(s) in file	Gender
Classes in file	– men – women
Publication variable(s)	Gender
Classes publication variable(s)	– men – women
Remarks	
Quality	Good

3. Age	
Tables	P1, P4, P7
Source	MPR-L
Definition	Self-evident
Operationalisation	Age on reference date (ultimo 2007)
Variable(s) in file	Date of birth
Classes in file	Self-evident
Publication variable(s)	Age
Classes publication variable(s)	– 15-34 years old – 35-44 years old – 45-54 years old – 55-64 years old – 65-69 years old – 70 years old or older
Remarks	
Quality	Good

4. Country of birth	
Tables	P2, P6, P7, P8
Source	MPR-L
Definition	Country in which the person was born.
Operationalisation	Self-evident
Variable(s) in file	Country of birth
Classes in file	Self-evident
Publication variable(s)	Country of birth, Netherlands Continent of birth Country of birth, EU Country of birth, OECD
Classes publication variable(s)	*Country of birth, Netherlands* – born in the Netherlands – not born in the Netherlands *Continent of birth* – born in Africa – born in North America – born in Central and South America – born in Asia – born in Europe – born in Oceania *Country of birth, EU* – born in EU country – born in non-EU country *Country of birth, OECD* – born in OECD country – born in non-OECD-country
Remarks	
Quality	Good.

5.Citizenship	
Tables	P2, P3, P4, P5, IMOB1, IMOB2
Source	MPR-L
Definition	Citizens are persons with the legal nationality of a country. Citizens of the Netherlands by birth are citizens of the Netherlands of whom at least one parent had the Dutch nationality at the moment of birth. Citizens of the Netherlands by naturalisation are Dutch citizens, but not by birth.
Operationalisation	Persons are a citizen of a country if they have the nationality of that country as their first nationality on the date of survey.
Variable(s) in file	First nationality
Classes in file	Self-evident
Publication variable(s)	Country of citizenship, Netherlands Continent of citizenship Country of citizenship, EU Country of citizenship, OECD
Classes publication variable(s)	*Country of citizenship, Netherlands* – Dutch citizens – citizens of other countries *Continent of citizenship* – African citizens – North-American citizens – Central- and South-American citizens – Asian citizens – European citizens – Oceanian citizens *Country of citizenship, EU* – citizens of EU countries – citizens of non-EU countries *Country of citizenship, OECD*

	– citizens of OECD countries – citizens of non-OECD countries
Remarks	
Quality	Good

6. Origin	
Tables	P2
Source	MPR-L
Definition	Origin gives information about the countries of birth of the parents.
Operationalisation	If both parents were born in the Netherlands, the person is native Dutch. If at least one of the parents is foreign born, the person has a foreign background.
Variable(s) in file	Country of birth of the mother Country of birth of the father
Classes in file	Self-evident
Publication variable(s)	Origin
Classes publication variable(s)	*Origin* – native Dutch – foreign background
Remarks	
Quality	Good

7. Length of stay in the country	
Tables	IMOB1
Source	MPR-L
Definition	Duration of stay in the Netherlands
Operationalisation	Length of consecutive period before date of survey in which person was registered in the MPR-L.
Variable(s) in file	Begin date and end date record
Classes in file	Self-evident
Publication variable(s)	Length of stay
Classes publication variable(s)	– less than 5 years

	– 5 - < 10 years – 10 years or more
Remarks	
Quality	Good

8. Previous country of residence	
Tables	IMOB2
Source	MPR-L
Definition	Country person stayed in before coming to the Netherlands.
Operationalisation	Country registered in the MPR-L as previous country of residence before the date of survey.
Variable(s) in file	Previous country of residence
Classes in file	Self-evident
Publication variable(s)	Previous continent of residence Previous country of residence, EU Previous country of residence, OECD
Classes publication variable(s)	*Previous continent of residence* – not applicable – Africa – North-America – Central- or South-America – Asia – Europe – Oceania *Previous country of residence, EU* – not applicable – EU country – non-EU country *Previous country of residence, OECD* – not applicable – OECD country – non-OECD country

Remarks	Previous country of residence is only defined for doctorate holders who moved into the Netherlands in the last nine years since only information from 1 January 1995 and onwards is available in the MPR-L.
Quality	Good

Information on doctorate

Information on the doctorate is taken from the LFS. If a doctorate holder has two or more doctorates, the information on the most recent doctorate was used.

9. Field of doctorate degree	
Tables	P5, P8
Source	LFS
Definition	The field of study in which the doctorate degree was completed.
Operationalisation	ISCED field of study as specified in the LFS.
Variable(s) in file	ISCED field of study, 3 digit
Classes in file	27 different classes
Publication variable(s)	ISCED field of study - 1 digit and 2 digit
Classes publication variable(s)	*ISCED field of study, 1 digit* – education – humanities and arts – social sciences, business and law – science (life sciences, physical sciences, mathematics and statistics and computing) – engineering, manufacturing and construction – agriculture – health and welfare – services *ISCED field of study, 2 digit* Subdivision of *ISCED field of study, 1 digit* into 23 classes.
Remarks	The required classification is the OECD field of science classification. This classification is not readily available at Statistics Netherlands. Therefore, in this feasibility study, the ISCED

	field of study was used.
Quality	Good

5 Abbreviations and translations

Abbreviation in English	Description	Abbreviation in Dutch
CDH	International survey on Careers of Doctorate holders	**CDH**
EUROSTAT	Statistical Office of the European Union	**EUROSTAT**
ISCED 1997	International Standard Classification of Education	**ISCED 1997**
LFS	Labour Force Survey	**EBB**
MPR-L	Longitudinal Municipal Population Register	**GBA-BUS**
OECD	Organisation for Economic Development and Cooperation	**OESO**
UIS	Unesco Institute for Statistics	**UIS**

6 References

Traag, T. en H.J. Dirven, Arbeidsmarktpositie van gepromoveerden, Sociaaleconomische trends, 4e kwartaal 2008, Statistics Netherlands, Den Haag.

Hersevoort, M., M. Rienstra and D. ter Haar, Careers of doctorate holders 2005 – feasibility study and first results, Centre for Policy Related Statistics, Statistics Netherlands, Den Haag.

Set of tables

Overview

Table P1
Doctorate holders by sex and age class, december 2007

	Total	Men	Women
	x 1 000		
Total	67	46	21
Less than 35 years old	6	3	3
35-44 years old	18	11	7
45-54 years old	19	13	6
55-64 years old	14	10	3
65-69 years old	3	3	.
70 years old or more	7	6	.

Table P2
Doctorate holders (15-69) by type of citizenship and country of birth, december 2007

	Total	Dutch			Foreign citizens	
		Total	Native Dutch	Foreign background	Total	o.w. citizens of EU countries
	x 1 000					
Total	60	58	50	8	2	1
Born in the Netherlands	55	54	49	5	.	.
Foreign born	5	4	1	3	1	1

Table P3
Doctorate holders (15-69) by sex and country of citizenship, december 2007

	Total	Men	Women
	x 1 000		
Total	60	40	20
Dutch citizens			
Total	58	39	19
Native Dutch	50	34	16
Foreign background	8	5	3
Foreign citizens			
Total	2	.	.
African citizens	.	.	.
North-American citizens	.	.	.
Central- and South-American citizens	.	.	.
Asian citizens	.	.	.
European citizens	1	.	.
Oceanian citizens	.	.	.
Citizens of EU countries	1	.	.
Citizens of non EU countries	.	.	.
Citizens of OECD countries	1	.	.
Citizens of non OECD countries	.	.	.

Table P4
Doctorate holders by citizenship and age class, december 2007

	Total	Dutch citizens	Foreign citizens
	x 1 000		
Total	67	65	2
Less than 35 years old	6	6	.
35-44 years old	18	17	.
45-54 years old	19	18	.
55-64 years old	14	13	.
65-69 years old	3	3	.
70 years old or more	7	7	.

Table P5
Doctorate holders (15-69) by citizenship and field of doctorate degree, december 2007

	Total	Dutch citizens	Foreign citizens
	x 1 000		
Total[1)]	60	58	2
Education	1	1	.
Teacher training and education science	1	1	.
Humanities and Arts	5	5	.
Arts	.	.	.
Humanities	4	4	.
Social sciences, business and law	13	12	.
Social and behavioural science	6	6	.
Business and administration	4	4	.
Law	3	3	.
Science	14	13	.
Life sciences	3	3	.
Physical sciences	8	8	.
Mathematics and statistics	1	1	.
Computing	1	1	.
Sciences, other	.	.	.
Engineering, manufacturing and construction	5	5	.
Engineering and engineering trades	3	3	.
Manufacturing and processing	.	.	.
Architecture and building	1	1	.
Agriculture	1	1	.
Agriculture, forestry and fishery	1	1	.
Veterinary	.	.	.
Health and welfare	20	20	.
Health	18	18	.
Social services	2	2	.
Services	1	1	.
Personal services	.	.	.
Environmental protection	.	.	.
Security services	.	.	.

1) The category 'Unknown' is suppressed, therefore the sum of the subtotals does not always equal the total.

Table P6
Doctorate holders (15-69) by sex and country of birth, december 2007

	Total	Men	Women
	x 1 000		
Total	60	40	20
Born in the Netherlands			
Total[1)]	55	37	17
Foreign born			
Total[1)]	5	3	2
Born in Africa	.	.	.
Born in North-America	.	.	.
Born in Central- or South-America	.	.	.
Born in Asia	2	1	.
Born in Europe	2	1	1
Born in Oceania	.	.	.
Born in EU country	2	1	1
Born in non EU country	3	2	1
Born in OECD country	2	1	1
Born in non OECD country	3	2	1

1) The category 'Unknown' is suppressed, therefore the sum of the subtotals does not always equal the total.

Table P7
Doctorate holders by country of birth and age class, december 2007

	Total	Born in the Netherlands	Foreign born
	x 1 000		
Total	67	60	6
Less than 35 years old	6	6	.
35-44 years old	18	16	2
45-54 years old	19	17	1
55-64 years old	14	12	1
65-69 years old	3	3	.
70 years old or more	7	6	.

Table P8
Doctorate holders (15-69) by country of birth and field of doctorate degree, december 2007

	Total	Born in the Netherlands	Foreign born
	x 1 000		
Total[1]	60	55	5
Education	1	1	.
Teacher training and education science	1	1	.
Humanities and Arts	5	4	.
Arts	.	.	.
Humanities	4	4	.
Social sciences, business and law	13	12	.
Social and behavioural science	6	5	.
Business and administration	4	4	.
Law	3	3	.
Science	14	13	1
Life sciences	3	3	.
Physical sciences	8	8	.
Mathematics and statistics	1	1	.
Computing	.	.	.
Sciences, other	.	.	.
Engineering, manufacturing and construction	5	4	.
Engineering and engineering trades	3	3	.
Manufacturing and processing	.	.	.
Architecture and building	1	1	.
Agriculture	1	1	.
Agriculture, forestry and fishery	1	1	.
Veterinary	.	.	.
Health and welfare	20	18	2
Health	18	16	2
Social services	2	2	.
Services	1	1	.
Personal services	.	.	.
Environmental protection	.	.	.
Security services	.	.	.

1) The category 'Unknown' is suppressed, therefore the sum of the subtotals does not always equal the total.

Table IMOB1
Doctorate holders (15-69) by citizenship and length of stay in the country, december 2007

	Total	Dutch citizens	Foreign citizens
	x 1 000		
Total	60	58	2
Less than 5 years	.	.	.
5 -< 10 years	3	2	.
10 years or more	57	56	1

Table IMOB2

Doctorate holders (15-69) by citizenship and previous country of residence, december 2007[1)]

	Total	Dutch citizens	Foreign citizens
	x 1 000		
Total[2)]	60	58	2
Not applicable	55	54	.
Africa	.	.	.
North-America	.	.	.
Central- or South-America	.	.	.
Asia	.	.	.
Europe	2	2	.
Oceania	.	.	.
Not applicable	55	54	.
EU country	2	2	.
Non EU country	2	1	.
Not applicable	55	54	.
OECD country	3	3	.
Non OECD country	.	.	.

1) Previous country of residence is only calculated for persons who moved into the country from 1995 onwards.
2) The category 'Unknown' is suppressed, therefore the sum of the subtotals does not always equal the total.