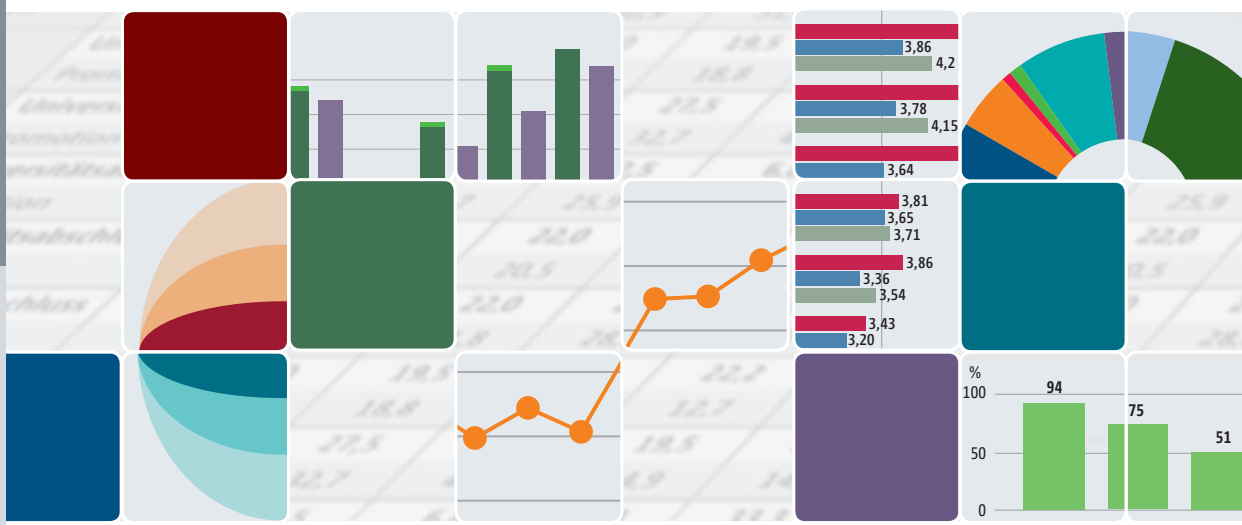
Consortium for the National Report on Junior Scholars

2017 National Report on Junior Scholars



Statistical Data and Research Findings on Doctoral Students and Doctorate Holders in Germany

Overview of Key Results

2017

wbv

BuWiN 2017 is published by an independent academic consortium under the direction of the Institute for Innovation and Technology *(iit)* as part of VDI/VDE-IT.

Within the consortium the iit was represented by Dr. Stefan Krabel, Dr. Nicolas Winterhager, Dr. Alexandra Shajek, Dr. Ina Lindow and Nadine Birner.

The other members of the consortium were:
Bavarian State Institute for Higher Education Research and Planning *(IHF)*, represented by Dr. Lydia Hartwig and Volker Banschbach

German Centre for Higher Education Research and Science Studies *(DZHW)*, represented by Dr. Georg Jongmanns (with *HIS-HE* from January 2015), Karl-Heinz Minks (until January 2016), Kolja Briedis (from February 2016) and Prof. Stefan Hornbostel (until December 2015 as representative of the Institute for Research Information and Quality Assurance, *iFQ*)

Institute for Research on Higher Education at Martin Luther University Halle-Wittenberg *(HoF)*, represented by Dr. Anke Burkhardt

International Centre for Higher Education Research Kassel *(INCHER-Kassel)*, represented by Prof. Georg Krücken and Dr. Anna Kosmützky

Federal Statistical Office *(Destatis)*, represented by Heinz-Werner Hetmeier and Miriam Wolters (in each case until September 2015), and by Pia Brugger and Sascha Hähnel (in each case from November 2015)

Other bodies contributing to BuWiN 2017
The consortium was advised by an Academic Advisory Board chaired by **Prof. Karl Ulrich Mayer.**

The other members of the council were:
- Prof. Jutta Allmendinger *(Berlin Social Science Centre, WZB)*
- Prof. Bernd Fitzenberger *(Humboldt University of Berlin)*
- Prof. Barbara Kehm *(Glasgow University)*
- Prof. Stefan Kuhlmann *(Twente University)*
- Prof. Kai Maaz *(German Institute for International Educational Research, DIPF)*
- Prof. emer. Amélie Mummendey *(Friedrich Schiller University Jena)*
- Prof. Beatrice Rammstedt *(Leibniz Institute for the Social Sciences, GESIS)*
- Prof. Ernst-Ludwig von Thadden *(Mannheim University)*
- Prof. Andrä Wolter *(Humboldt University of Berlin)*

The consortium also coordinated its work with a steering group consisting of representatives of the following institutions:
- Federal Ministry of Education and Research *(BMBF)*
- German Research Foundation *(DFG)*
- Higher education/science ministries of the federal states, represented by the Brandenburg State Ministry for Science, Research and Culture *(MWFK)*
- German Rectors' Conference *(HRK)*
- Standing Conference of the Ministers of Education and Cultural Affairs *(KMK)*
- German Council of Science and Humanities *(WR)*

Accompanying studies relating to BuWiN 2017
BuWiN 2017 was produced on the basis of accompanying studies to which the following authors contributed:

Dr. Nicolas Winterhager, Nadine Birner, Dr. Christoph Bogenstahl and Dr. Stefan Krabel *(Institute for Innovation and Technology, iit)*

Kerstin Jahn, Steffen Jaksztat and Dr. Maike Reimer *(Bavarian State Institute for Higher Education Research and Planning, IHF)*

Dr. Anke Burkhardt, Gunter Quaisser, Barbara Schnalzger and Christoph Schubert *(Institute for Research on Higher Education at Martin Luther University Halle-Wittenberg, HoF)*

Dr. habil. Christiane Gross, Dominika Urbanski and Laura Schoger; with the collaboration of Sarah Hentrich *(Institute of Sociology, ISH – Leibniz University of Hanover)*

Nicolai Netz and Hendrik Schirmer *(German Centre for Higher Education Research and Science Studies, DZHW)*

Jakob Tesch, Dr. Nathalie Huber, Jörg Neufeld, Paul Donner, Valeria Aman and Dr. Stephan Gauch; with the collaboration of Fabian Bremer, Stefanie Hobohm, Justus Maximilian Karl Rathmann and Madeleine Siegel *(German Centre for Higher Education Research and Science Studies, DZHW)*

Wolfgang Auer, Anita Fichtl, Dr. Timo Hener, Dr. Marc Piopiunik and Prof. Helmut Rainer *(ifo Institute – Leibniz Institute for Economic Research at the University of Munich)*

Janine Lange, Dr. Anja Oppermann and Dr. Antje Wegner *(German Centre for Higher Education Research and Science Studies, DZHW)*

Abbreviations:

BB	=	Brandenburg
BE	=	Berlin
BW	=	Baden-Wuerttemberg
BY	=	Bavaria
HB	=	Bremen
HE	=	Hesse
HH	=	Hamburg
MV	=	Mecklenburg-Western Pomerania
NI	=	Lower Saxony
NW	=	North Rhine-Westphalia
RP	=	Rhineland-Palatinate
SH	=	Schleswig-Holstein
SL	=	Saarland
SN	=	Saxony
ST	=	Saxony-Anhalt
TH	=	Thuringia

Published by: Consortium for the National Report on Junior Scholars

The abridged version is based on the publication: 2017 National Report on Junior Scholars – Statistical Data and Research Findings on Doctoral Students and Doctorate Holders in Germany (Bundesbericht Wissenschaftlicher Nachwuchs 2017 – Statistische Daten und Forschungsbefunde zu Promovierenden und Promovierten in Deutschland)
Bielefeld 2017, 296 pages, € 49.90 (D)
ISBN 978-3-7639-5850-4, Order no. 6004603

Overall production and publication:
W. Bertelsmann Verlag GmbH & Co. KG
P.O. Box 10 06 33, 33506 Bielefeld
Telephone: +49 (0)5 21 9 11 01-11
E-mail: service@wbv.de
Internet: wbv.de

Design: Marion Schnepf, lokbase.com

This publication is freely available for downloading from **buwin.de**

The project on which this report is based was funded by the Federal Ministry of Education and Research (BMBF).

SPONSORED BY THE

Federal Ministry of Education and Research

Introduction

Junior scholars make a telling contribution to developing scientific and social insights and to innovation. They are also key to satisfying the future demand of the modern knowledge society for highly skilled labour. For these reasons, it is especially important to report on the situation of junior scholars as well.

Following the publication of the first National Report on Junior Scholars (Bundesbericht Wissenschaftlicher Nachwuchs – BuWiN) in 2008, the parliamentary sitting of 18 June 2009 called on the federal government to report regularly, at least once every legislative session, on the situation of junior scholars in Germany, focusing each time on different aspects. This 2017 edition of BuWiN is the third; the second one was published in 2013.

The purpose of the report is to process and analyse the available findings and data concerning young academics in Germany. It thus produces a body of empirical basic knowledge for academics, serves as a relevant steering instrument for the federal and state governments as well as scientific institutions and funding organisations. Further, the report serves as a point of reference for young scholars themselves.

This report focuses on the training and career development of researchers from initial graduation through to their doctorate, and follows their progression in the subsequent phase of further academic training and activity through to the transition to permanent employment in the academic or non-academic labour market. In particular, the BuWiN 2017 focuses on the compatibility of family life and an academic career, which is analysed in a separate chapter.

Given that this is a national report, it focuses on developments at national level. It predominantly analyses official statistics that are representative for the whole of Germany, alongside information collected by regular surveys, in order to facilitate comparisons with the preceding reports and, with a view to future reports, to ensure continuity. If critical research questions could not be resolved with the aid of the official statistics and regular surveys alone, reference was also made to the results of individual studies by consulting literature reviews. Apart from some exceptions, consideration was given to studies and data sets produced in the period up to 1 January 2016.

The report seeks to put the findings in context by undertaking systematic comparisons with information on junior scholars from a variety of sources and by referencing selected peer groups. In addition, the data are presented – where possible and helpful – separately by subject group, type of organisation (e.g. higher education (HE) institutions and non-university research facilities[1]), training and career phase, and by gender. Finally, some of the results for Germany are presented in their international context.

BuWiN 2017 is published by an independent academic consortium under the direction of the Institute for Innovation and Technology (iit). Alongside the iit, the consortium consists of representatives of the following academic institutions:

- Bavarian State Institute for Higher Education Research and Planning (IHF)
- German Centre for Higher Education Research and Science Studies (DZHW)
- Institute for Research on Higher Education at Martin Luther University Halle-Wittenberg (HoF)
- International Centre for Higher Education Research Kassel (INCHER-Kassel)
- Federal Statistical Office (Destatis)

The consortium is jointly responsible for the report and was advised by an Academic Advisory Board chaired by Prof. Karl Ulrich Mayer. It also coordinated its work on the report with a steering group consisting of representatives of the following institutions:

- Federal Ministry of Education and Research (BMBF)
- German Research Foundation (DFG)
- German Rectors' Conference (HRK)
- Higher education/science ministries of the federal states, represented by the Brandenburg State Ministry for Science, Research and Culture (MWFK)
- Standing Conference of the Ministers of Education and Cultural Affairs (KMK)
- German Council of Science and Humanities (WR)

In addition, interim stages of the work were discussed in two meetings with prospective BuWiN users.

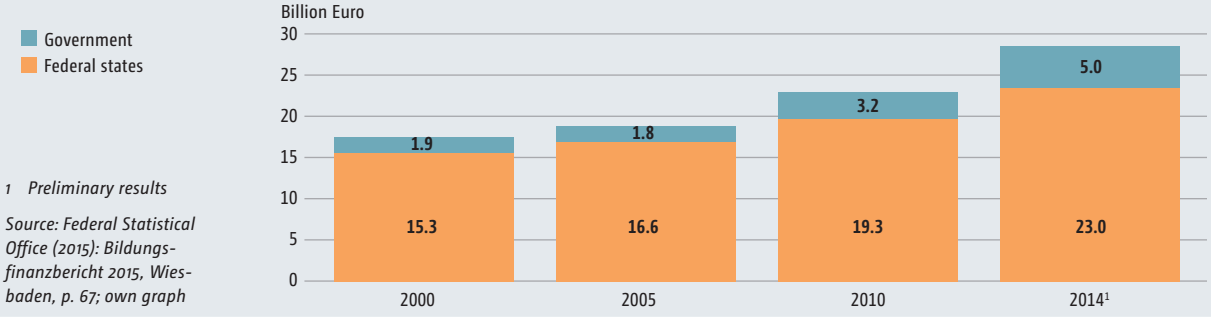
1 The non-university research facilities include the four major scientific bodies, namely Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (FhG), Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V. (HGF), Max-Planck-Gesellschaft e.V. (MPG), and institutes overseen by Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz e.V. (WGL).

A Framework conditions underpinning junior scholars' training and comments concerning methodology

A1 Training and support for junior scholars in Germany

- **HE institutions and non-university research facilities are the main providers of training for young scientists:** The number of doctoral students and doctorate holders in universities is rising continuously. To an increasing extent, universities of applied sciences are training doctoral candidates as well, and cooperative procedures leading to the award of a doctoral degree are being conducted jointly with the universities and equivalent HE institutions. Furthermore, in 2014, 10% of all students completing a doctoral degree were supervised jointly by non-university research organisations and universities.
- **Extensive reform initiatives relating to career and training structures:** In recent years extensive reform initiatives targeting HE institutions and non-university research facilities have been implemented in the form of legislative amendments and support programmes, in particular the amendment to the Law on Fixed-term Contracts in Higher Education and Research (WissZeitVG) that came into force on 17 March 2016, and the Junior Scholars' Support Programme (so called tenure track programme) adopted by the federal government and the federal states by way of the administrative arrangement of 16 June 2016.
- **Amendment to Article 91b Basic Law (GG):** Whereas non-university research organisations are predominantly financed by the federal government through institutional funding, public sector HE institutions obtain their basic funding from the budgets of the federal states. At the same time, the federal government is contributing more and more to the funding of HE institutions, especially through fixed-term support programmes (**Fig. 1**). One of the factors triggering a fresh approach to HE funding by the federal government has been the amendment to Article 91b GG that took effect on 1 January 2015, which has substantially extended the scope for cooperation between the federal government and the federal states in the higher education sector. On the basis of specific arrangements the federal government together with the states can now permanently fund HE institutions or parts of them in cases of national significance. According to the explicit legislative intent, the federal government – in collaboration with the federal states – can support new measures within the framework of basic funding in the future, for example with a view to bolstering the future prospects of junior scholars.

Fig. 1: Public expenditure on HE institutions 2000 to 2014 by governmental body (in billion euros)



1 *Preliminary results*

Source: Federal Statistical Office (2015): Bildungsfinanzbericht 2015, Wiesbaden, p. 67; own graph

A2 Key topics relating to the training of junior scholars

- **Six topic areas:** Six areas have been identified that are of key significance for sustaining the performance and competitiveness of the HE and non-university research sector in the long term, safeguarding the international appeal of an academic career in Germany and ensuring the high quality of training for junior scholars. These topic areas are also subject of a general public debate with varying degrees of intensity. They were pinpointed by monitoring both the German press and media releases issued by science policy actors. The topics are addressed again later together with empirical data, in Parts **B** and **C** of the report.
- **Planning for an academic career:** The existence of a sound basis for young doctorate holders to map out an academic career is a major topic of the public debate concerning junior scholars (see also Chapter **B6**). One of the principal inhibiting factors discussed is the bottleneck caused by the plethora of junior scholars on the one hand, and the relatively small number of professorships to be filled or becoming vacant on the other.
- **Working and employment conditions:** One of the aspects of the debate concerning working and employment conditions is the very high proportion of junior scholars who are employed on fixed-term contracts (see Chapter **B2**). HE institutions and non-university research facilities are also criticised for regularly offering very short-term employment contracts. A third topic that arises in this context is the question of appropriate remuneration in higher education, in particular for part-time lecturers and doctoral students without a regular employment contract with an HE institution or non-university research facility. Fourth, a critical view is taken of the fact that the actual number of hours worked by junior scholars, especially doctoral candidates, far exceeds their contractual working hours.
- **Internationalisation:** When the topic of internationalisation is being discussed, it is assumed that a variety of internationalisation aspects contribute to an increase in the performance and competitiveness of the German HE and non-university research sector. Among the aspects that are highlighted in this context are the distinct international mobility of German junior scholars (see Chapter **B7**), the large proportion of foreign doctoral students and post-docs in Germany, and the international compatibility of career and personnel structures in German HE institutions and non-university research facilities.
- **Quality assurance during academic training:** Quality issues relating to doctoral studies have been a subject of debate for some time including, in particular, high drop-out rates, long study duration, and the inadequate teaching of key skills for the (non-academic) labour market. Various aspects have been highlighted with a view to improving the quality of doctoral studies, such as the procedures for selecting doctoral candidates, the intensity and quality of supervision, and the development of skills in the academic work undertaken during the doctoral process (see Chapters **B3** and **B4**).
- **Equal opportunities:** The public debate concerning equal opportunities focuses primarily on gender equality. It concentrates, in particular, on the fact that the proportion of women pursuing an academic career declines on the higher rungs of the career ladder. This is generally believed to be an indication that women still lack equality with men as regards access to professorships. Other aspects of equal opportunities are seldom highlighted, including possible discrimination based on ethnic, social or regional background, sexual orientation, age, illness or disability.

- **Compatibility of family life and academic career:** The public debate concerning the challenge of striking a balance between family life and an academic career (see Part **C**) highlights two issues in particular. First, the challenge is seen to arise from the uncertain prospects offered by an academic career and, as described above, the working and employment conditions in HE institutions and non-university research facilities, which are regarded as difficult to reconcile both with the decision to raise a family and with the practicalities of childcare. The second major issue is the discrimination of female academics, as outlined above. In this respect it is assumed that, as they ascend the career ladder, women – because they wish to start, or have already started, a family – are more likely than men to turn their backs on the HE and non-university research sector. By the same token, women wishing to pursue an academic career more often remain childless and single.

A3 Terminology and concepts

- **Controversial definitions of junior scholar:** In the narrow sense, the German collective term for junior scholar or young scientist, namely wissenschaftlicher Nachwuchs, describes a person who is undergoing academic training, i.e. seeking to obtain a doctoral degree or, as a post-doc, working in an HE institution or non-university research facility with the aim of becoming a professor or leading academic. The term regularly attracts criticism, however, because it is used to designate a group of people who are already highly qualified and, as a general rule, in regular employment (e.g. as research and teaching assistants at an HE institution). It is also used frequently to include scholars who do not wish to become a professor or leading academic, or whose training and career goals cannot be unequivocally determined for want of information. A large proportion of junior scholars step down from posts in HE institutions and non-university research facilities to pursue a career outside the academic sector. It is questionable in which area and in which position such individuals can legitimately be regarded – as implied by the German term – as destined for an academic career.

- **Junior scholars in the narrow sense and prospects:** Alongside junior scholars in the narrow sense, in other words doctoral candidates and post-docs at HE institutions and non-university research facilities, the report and empirical analyses also give consideration to the prospects of young scientists in general. This perspective includes all HE graduates and doctorate holders, in particular those who are engaged in scientific work in the field of research, development and/or academic teaching, but not studying for a doctor's degree and not employed by an HE institution or non-university research facility. Giving consideration to the prospects of junior scholars is significant in connection with various issues, such as questions concerning the appointment of professors by universities of applied sciences.

B Results of monitoring junior scholars

Basic information relating to junior scholars

B1 Number of junior scholars and socio-demographic characteristics

- **Number of scholars can be approximated:** For the purposes of identifying junior scholars, various aids have to be applied in the data sets, in particular age limits. In this way the number of junior scholars and their prospects can be quantified approximately (**Tab. 1**).
- **Significant increases over time:** Apart from academics with habilitations (a formal post-doctoral award making the holder eligible for a professorship), the number of junior scholars has increased significantly over time. This applies, in particular, to the largest group of junior scholars, namely those in HE institutions, which has expanded by 76% since 2000. In contrast, the number of professors at HE institutions has risen by only 21% (**Tab. 2**).

Tab. 1: Number of junior scholars and prospects (in persons)

Group of junior scholars/prospects	Up to 34 years old	35 to 44 years old	Data source/comments
HE graduates	1,664,000	–	Micro census 2014; only graduates eligible for doctoral studies, universities (diploma, master's) and universities of applied sciences (master's).
Doctoral students	196,200		Federal Statistical Office (2016): Promovierende in Deutschland – Wintersemester 2014/2015, Wiesbaden; no age limit
Doctorate holders	354,000		Micro census 2014
Arts and science staff (excluding professors) working in HE institutions (main occupation)	109,880	35,047	Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; staff with term contracts; doctor's qualification not recorded
Academics at non-university research and scientific institutions elsewhere in the public sector	24,729	13,875	Federal Statistical Office (2016): Ausgaben, Einnahmen und Personal der öffentlichen und öffentlich geförderten Einrichtungen für Wissenschaft, Forschung und Entwicklung, Sonderauswertung, Wiesbaden; up to 34 years old: not doctorate holders; 35 to 44 years old: doctorate holders
Academics in the private sector	58,926	67,737	Stifterverband für die Deutsche Wissenschaft (2016): Sondererhebung 2013, Fokus wissenschaftliches FuE-Personal, Sonderauswertung, Essen
Junior professors	1,613		Federal Statistical Office (2015): Personal an Hochschulen 2014 – Fachserie 11, Reihe 4.4, Wiesbaden; no age limit
Junior research group leaders	921		Joint Science Conference (GWK) (2015): Pakt für Forschung und Innovation Monitoring-Bericht 2015 (Berichtsjahr 2014); and German Research Foundation (DFG) (2016): Emmy Noether-Geförderte für den Bundesbericht Wissenschaftlicher Nachwuchs (BuWiN) 2017, Sonderauswertung, Bonn; no age limit
Doctoral degree holders with habilitation	6,205		Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden
Temporary professors (W2, W3)	2,026		Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; only public sector and state-recognised universities and equivalent HE institutions; no age limit

Source: Own table

Tab. 2: Arts and science staff working in HE institutions (main occupation) 2000 to 2014 by age group (in persons)

	2000	2005	2010	2014	Increase (2000–2014)
	number				in %
Arts and science staff (excluding professors) up to 44 years old with fixed-term contracts at HE institutions	82,403	87,344	128,547	144,927	76
… of whom up to 34 years old	57,613	60,524	98,052	109,880	91
… of whom 35 to 44 years old	24,790	26,820	30,495	35,047	41
In comparison: professors	37,794	37,865	41,462	45,749	21

Source: Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; for professors: Federal Statistical Office (various): Personal an Hochschulen 2014 – Fachserie 11, Reihe 4.4, Wiesbaden; own table

Tab. 3: Proportion of women in various groups of junior scholars and prospects in 2014 by subject group (in %)

Subject groups	HE degree awards conferring eligibility for doctoral studies	Doctoral students	Doctoral degree awards	Junior professorships	Habilitations	Appointments to W2 posts	Appointments to W3 posts
	in %						
Languages and cultural studies	74	61	57	56	43	44	47
Sport	46	.[1]	38	36	45	50	0
Law, economics and social sciences	52	43	38	35	25	43	35
Mathematics, natural sciences	39	41	40	30	21	22	25
Human medicine/health sciences	63	58	60	35	25	29	15
Veterinary medicine	83	79	84	56	80	0	0
Agriculture, forestry and food science	60	59	52	59	40	43	0
Engineering	23	21	19	33	15	10	8
Art, art studies	64	66	63	51	40	42	67
Total	48	44	45	40	28	34	28
n =	*153,888*	*196,200*	*28,147*	*1,613*	*1,627*	*243*	*241*

1 Figure unknown or confidential.

Sources: For HE graduates: Federal Statistical Office (2016): Prüfungen an Hochschulen, Sonderauswertung, Wiesbaden; for doctoral students: Federal Statistical Office (2016): Promovierende in Deutschland – Wintersemester 2014/2015, Wiesbaden; for doctoral degree awards: Federal Statistical Office (2015): Prüfungen an Hochschulen 2014 – Fachserie 11, Reihe 4.2, Wiesbaden; for habilitations: Federal Statistical Office (2015): Personal an Hochschulen 2014 – Fachserie 11, Reihe 4.4, Wiesbaden; for junior professorships and W2 and W3 appointments: Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; own table

Tab. 4: Average (arithmetic mean) age of various groups of junior scholars and prospects in 2014 by subject group

Subject groups	HE degree awards conferring eligibility for doctoral studies	Doctoral degree awards	Junior professorships (new appointments)	Habilitations	New appointments to W2 posts	New appointments to W3 posts
Languages and cultural studies	29.7	35.8	37.5	42.3	43.3	44.9
Sport	28.6	35.1	37.5	39.4	51.0	.[1]
Law, economics and social sciences	28.5	33.2	34.2	40.4	40.4	39.6
Mathematics, natural sciences	27.5	31.4	34.3	40.5	39.3	40.7
Human medicine/health sciences	29.2	31.7	34.7	40.2	41.7	42.5
Veterinary medicine	27.7	31.7	.[1]	43.4	.[1]	48.0
Agriculture, forestry and food science	27.8	33.4	.[1]	44.8	39.1	44.4
Engineering	27.9	33.6	35.7	44.1	41.5	43.5
Art, art studies	29.3	38.6	37.5	43.3	44.8	48.3
Total	28.4	32.6	35.2	40.9	41.4	42.4
n =	*153,888*	*28,147*	*82*	*1,627*	*243*	*241*

1 Figure unknown or confidential.

Sources: For HE and doctoral degree awards: Federal Statistical Office (2016): Prüfungen an Hochschulen, Sonderauswertung, Wiesbaden; for habilitations: Federal Statistical Office (2015): Personal an Hochschulen 2014 – Fachserie 11, Reihe 4.4, Wiesbaden; for junior professorships and W2 and W3 appointments: Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; own table

- **Declining proportion of women in higher stages of training and career:** Apart from some exceptions, a notable decline is apparent in the proportion of women ascending the training and career ladder (leaky pipeline). The proportion of women also differs among individual subject groups (**Tab. 3**).
- **Average age varies according to subject group:** The average age of junior scholars in the various stages of training and career differs markedly between subject groups (**Tab. 4**).

B2 Working and employment conditions

- **Appealing working contexts, problematic employment conditions:** The working conditions of research and teaching staff in HE institutions and non-university research facilities are rather attractive. Among the benefits are flexibility in terms of working time and interesting subject matter. Altogether, these and other factors make an academic career extremely attractive from the perspective of junior scholars. The employment conditions for junior scholars, on the other hand, are considered to be rather problematic.

Fixed-term contracts

- **Very high proportion of fixed-term contracts for junior scholars:** Of the junior scholars working in HE institutions, 93% have fixed-term contracts. The corresponding figure for those working in non-university research facilities is 84%. Even allowing for age and qualifications, the proportion of employees with fixed-term contracts in other sectors of the labour market is much lower.
- **Increase in fixed-term contracts for academic staff paid out of regular university budgets (basic funding) as well:** The large quota of fixed-term contracts in HE institutions reflects an increase in the proportion of research and teaching assistants financed by external funds, as these funds are generally granted for time-limited projects. Employees who are financed in this way are thus more likely to have fixed-term contracts. Nonetheless, it is notable that the proportion of fixed-term contracts for research and teaching assistants paid out of basic institutional funding has increased over time as well (**Tab. 5**).
- **Barely any difference in proportion of fixed-term contracts between subject groups and genders:** The proportion of fixed-term contracts in the individual subject groups differs only marginally. In addition, female junior scholars employed by non-university research facilities or HE institutions are no more likely to have a fixed-term contract than their male counterparts (**Figs. 2 and 3**).

Tab. 5: Research and teaching assistants working in HE institutions (main occupation) 2000 to 2014 by type of funding and term of employment (in %)

Contract	2000		2005		2010		2014	
	Basic funding	External funding	Basic funding	External funding	Basic funding	External funding	Basic funding	External funding
	in %							
Permanent	37	6	32	10	25	2	25	2
Temporary	63	94	68	90	75	98	75	98

Source: Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; own table

Fig. 2: Proportion of arts and science staff working in HE institutions (main occupation) (up to 44 years old, excluding professors) with fixed-term contracts in 2014 by gender and subject group (in %)[1]

1 The percentages indicate the proportion of the total number of male/female employees in the relevant subject group who have fixed-term contracts.

2 Other subject groups: Sport; agriculture, forestry and food science; art, art studies; central facilities

Source: Federal Statistical Office (2016): Personal an Hochschulen, Sonderauswertung, Wiesbaden; own graph

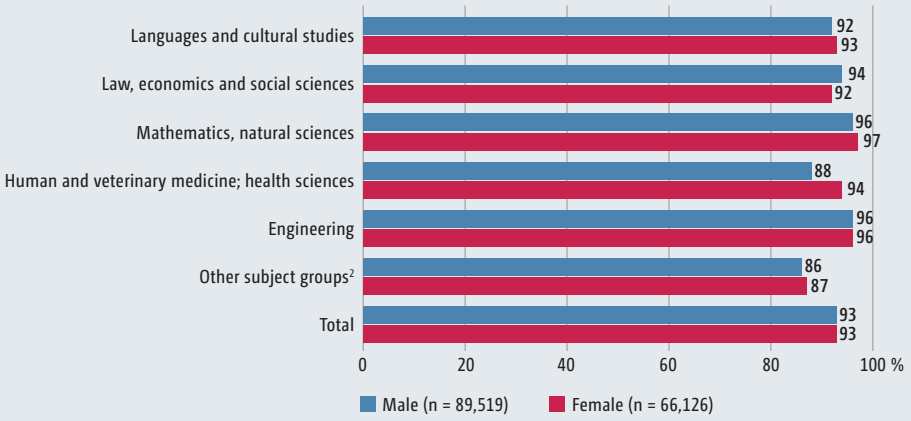
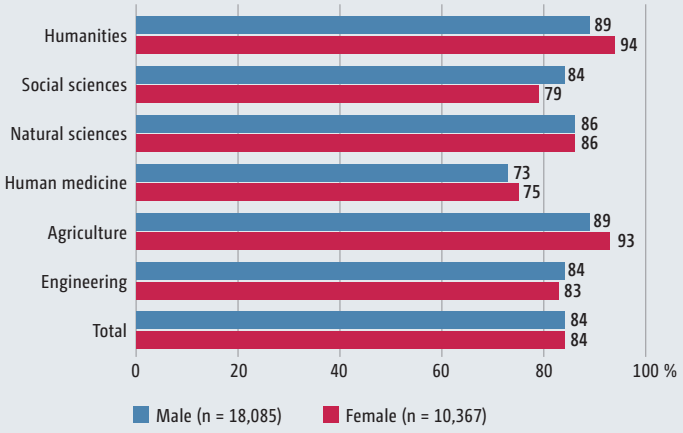


Fig. 3: Proportion of academic staff working in non-university research facilities[1] (pre-docs up to 34 years old, post-docs from 35 to 44 years old) with fixed-term contracts in 2013 by gender and subject group (in %)[2]

1 The non-university research facilities include only the four major scientific bodies, namely Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. (FhG), Hermann von Helmholtz-Gemeinschaft Deutscher Forschungszentren e.V. (HGF), Max-Planck-Gesellschaft e.V. (MPG), and institutes overseen by Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz e.V. (WGL).

2 The percentages indicate the proportion of the total number of male/female employees in the relevant subject group who have fixed-term contracts.

Source: Federal Statistical Office (2016): Ausgaben, Einnahmen und Personal der öffentlichen und öffentlich geförderten Einrichtungen für Wissenschaft, Forschung und Entwicklung, Sonderauswertung, Wiesbaden; own graph



Contract durations

- **Only little information available on contract durations:** The extent of data relating to contract terms is limited. The most extensive, but non-representative, study shows that 53% of all employment contracts (new contracts and renewals) with junior scholars at HE institutions and 50% of the contracts with young scientists employed by non-university research facilities have a term of less than one year.
- **Short-term contracts not only for junior scholars:** Comparable data from the Micro census 2011 indicate that 42% of all employed HE graduates with fixed-term contracts in Germany have a contract for less than one year. This demonstrates that short-term contracts are by no means exclusive to junior scholars. On the other hand, fixed-term contracts are generally concluded with junior scholars at HE institutions and non-university research facilities. Typically, these are not based on the Law concerning Part-Time and Short-Term Employment (TzBfG), but based on the WissZeitVG. In principle, therefore, much longer periods of temporary employment, encompassing a succession of fixed-term contracts with one or several institutions, are possible.

Income and working hours

- **Doctoral students generally not at risk of poverty:** Doctoral students dispose of an average monthly net income amounting to 1,261 euros and are generally not at risk of poverty. However, 12% of doctoral candidates have particularly low incomes of less than 826 euros, which is the poverty threshold defined by the Micro census 2010. Incomes at this level are much more prevalent in the humanities and cultural sciences than in other disciplines.
- **Contractual working hours vary among subject groups:** As regards the proportion of full-time employees among the academic staff at HE institutions and non-university research facilities, a clear division exists between the natural sciences and technical subjects on the one hand (majority of full-time employees), and the humanities and cultural sciences on the other (large proportion of part-time employees). In HE institutions the proportion of full-time employees (defined here as those working at least 2/3 of the regular hours of a full-time employee) varies between 42% in languages and cultural studies, and 82% in engineering. In non-university research facilities the full-time quota (defined here as those working more than 1/2 of the regular hours of a full-time employee) lies within a range of 49% in the humanities to 72% in engineering.
- **Women more often employed part-time:** Across all subject groups, women are employed part-time more often than men. In total, 56% of female and 71% of male junior scholars work full-time in non-university research facilities. In HE institutions 68% of male junior scholars, but only 54% of female junior scholars, are working full-time.

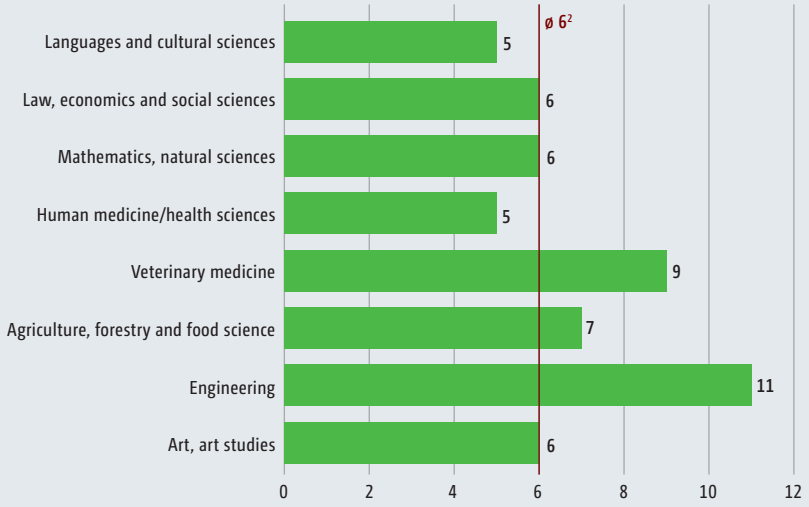
Contractual and actual working hours

- **Doctoral students employed predominantly in HE institutions:** 83% of doctoral candidates are in employment. Of these, 77% are working for HE institutions. Following well behind as the second and third largest employers of doctoral students are (non-profit) non-university research facilities (7%) and business (6%). Some 11% of doctoral candidates indicate that they are employed by „other organisations".
- **Doctoral students work unpaid overtime:** Doctoral candidates work additional hours without pay. This applies in particular to those who are employed as research and teaching assistants by HE institutions and non-university research facilities.
- **Majority of working hours are used for doctoral studies:** Across all employment and subject groups, doctoral students can use the majority of their working hours to pursue their studies. Of the 7.7 daily working hours, they use an average of 4.5 hours (58%) to further their doctoral studies, 1.3 hours for other research activities, 1 hour for teaching and supervision, and 0.9 hours for administration.

B3 Qualification conditions for doctoral students

- **On average one professor supervises six doctoral candidates:** Each professor supervises an average of six doctoral students (**Fig. 4**). Considerable differences exist, however, among and within subject groups. The average number of supervised doctoral candidates per professor ranges from 5 in languages and cultural studies to 11 in engineering. Whereas there are 3,500 professors who are not supervising any doctoral candidates, there are also as many as 1,100 professors who are supervising 21 or more doctoral students.

Fig. 4: Number of doctoral students supervised per professor in 2014/15 by subject group[1]



1 Sport is not shown as a subject group because relevant figures are unavailable, insufficiently reliable, unknown, or confidential.

2 The average value of 6 doctoral students for each professor includes the sport subject group.

Source: Federal Statistical Office (2016): Promovierende in Deutschland – Wintersemester 2014/2015, Wiesbaden; own graph

- **23% of doctoral candidates pursuing structured programmes:** Recent surveys indicate that 23% of doctoral students are enrolled in a structured doctoral programme. However, formal membership in a doctoral programme does not always adequately indicate whether any, or which specific, elements of structured formats actually exist during the course of study. First, considerable differences exist in this respect within the various structured programmes. Second, a candidate can take part in a programme or attend individual sessions without necessarily being a formal member. And third, alongside the distinct individual and structured programmes, numerous hybrid forms of doctoral study exist in practice.
- **53 to 76% of doctoral candidates supported by multiple supervisors:** Doctoral students are supported by more than one supervisor as a rule. Depending on the discipline, the proportion of candidates receiving this form of support varies between 53 and 76%. Those belonging to structured programmes are more likely to be supported by more than one supervisor. The differences between subject groups are substantial. In biology, 73% of students have multiple supervisors, and 40% of candidates are supported by three or more supervisors. In law, multiple supervisors are the exception – here the ratio stands at just 19%.

Tab. 6: General satisfaction with support during doctoral studies (in %[1])

	ProFile 2011	WiNbus 2011
	in %	
(Very) satisfied	65	55
Neither satisfied nor dissatisfied	22	26
Not (at all) satisfied/(highly) dissatisfied	14	19
n =	*2,304*	*2,824*

1 Deviations from 100% are due to rounding.

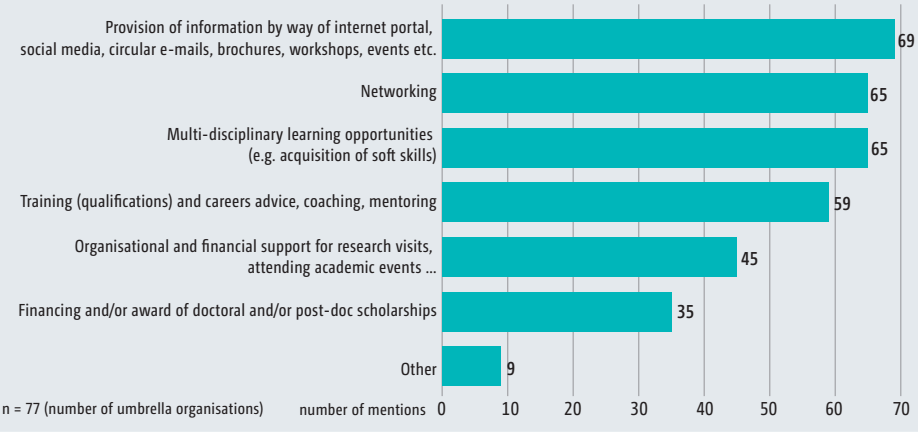
Sources: ProFile 2011: Sonderauswertung zu Hauss, K./Kaulisch, M./Zinnbauer, M./Tesch, J./Frässdorf, A./Hinze, S./Hornbostel, S. (2012): Promovierende im Profil: Wege, Strukturen und Rahmenbedingungen von Promotionen in Deutschland; WiNbus 2011: Jaksztat, S./Pressler, N./Briedis, K. (2012): Promotionen im Fokus. Promotions- und Arbeitsbedingungen Promovierender im Vergleich, Hanover, p. 35; own table

- **Doctoral students predominantly satisfied with support:** Between 55 and 65% of doctoral candidates are either generally or very satisfied with the support they receive. Only a small proportion (between 14 and 19%) are dissatisfied with the support (**Tab. 6**). No differences in satisfaction are discernible between subjects, genders or programme types.
- **Doctoral degree awarded after 3.5 to 4.5 years:** It takes between 3.5 and 4.5 years to obtain a doctoral degree (from the beginning, as stated by the candidate, until the oral examination). Although structured formats generally have slightly shorter study periods, only marginal differences exist between the various types of study. As a rule, engineering doctorates take the longest time to complete and doctoral degrees in the natural sciences the shortest. There are generally no gender differences.
- **Completion rates of doctoral degrees between 57 and 67%:** Hardly any reliable information exists on doctoral degree completion and drop-out rates. The available data indicate a completion rate between 57 and 67%. Completion rates in the natural sciences and medicine are above average.

B4 Institutional umbrella organisations supporting doctoral studies

- **History of HE institutions with umbrella organisations to support doctoral studies since 2000:** Umbrella organisations embedded within HE institutions fulfil a dual function. First, they bring together and coordinate the various support programmes and measures for junior scholars offered by the host institution. And second, they support structured doctoral studies in particular with administrative, personnel, financial and/or thematic resources. The earliest record of such an umbrella organisation being established dates back to the year 2000. A continuous stream of foundations took place from 2005 onwards. An upward trend in the overall number persisted until 2009, which marked the start of a decline in new organisations. In 2015, 90 umbrella organisations existed at 69 of the HE institutions entitled to award doctorates.
- **Majority of umbrella organisations are permanent; public sector funding predominates:** 80% of all umbrella organisations are established without limitation in time. Only 20% have been established for a limited time . They are typically financed by a mix of public (federal state) and private sector funding. 55% of the umbrella organisations receive more than 75% of their funding from public budgets. The average payroll consists of around two full-time equivalents each for academic and other staff.

Fig. 5: Number of umbrella organisations supporting junior scholars[1] and services offered in 2015



1 *Support for junior scholars: supervision and support of junior academic staff*

Source: HoF survey 2015

- **Numerous duties and target groups:** The umbrella organisations carry out numerous activities (**Fig. 5**) and perform diverse services for a broad target group, ranging from HE graduates to junior professors.
- **Quality assurance measures and procedures established across the board:** Quality assurance (QA) measures and procedures exist across the board in the umbrella organisations, which indicates that they have become increasingly professional. The most common QA activity is regular reporting to senior lead institutions. The next most regularly implemented measures are internal evaluation and continuous monitoring.

Transitions to academic training and decisions during career progression

B5 Decisions and transitions to doctoral studies

- **Proportion of doctorates varies by subject group:** The value and the prevalence of doctoral degree awards differ – substantially in some cases – from one subject group to the next. In human medicine/health sciences, mathematics and natural sciences, in particular, an above-average proportion of doctorates are awarded (**Tab. 7**). This may be attributable to differences according to which subject-specific labour markets reward doctoral degrees or regard their lack negatively. Concerning the demand side differences may also occur in terms of the number of and resources for doctoral positions and opportunities. The breakdown of doctoral degree awards by gender shows that women are a little less likely to obtain a doctorate than men in almost every subject group.

Tab. 7: Proportion of doctorates by gender and subject group (in %)[1]

Subject groups	Overall proportion of doctorates (men and women)	Proportion of doctorates (women)
	in %	
Languages and cultural studies	13	10
Sport	7	7
Law, economics and social sciences	9	7
Mathematics, natural sciences	40	39
Human medicine/health sciences	63	61
Veterinary medicine	52	50
Agriculture, forestry and food science	22	18
Engineering	19	13
Art, art studies	4	4
Total	**22**	**19**

1 *The proportion of doctorates is an approximation based on the ratio of doctorates awarded to the number of HE degree awards conferring eligibility for doctoral studies four years earlier. The table gives consideration to HE degree awards conferring eligibility for doctoral studies from 2003 to 2010, and doctorates awarded in the period from 2007 to 2014.*

Source: Federal Statistical Office (various): Prüfungen an Hochschulen 2014 – Fachserie 11, Reihe 4.2, Wiesbaden; own table

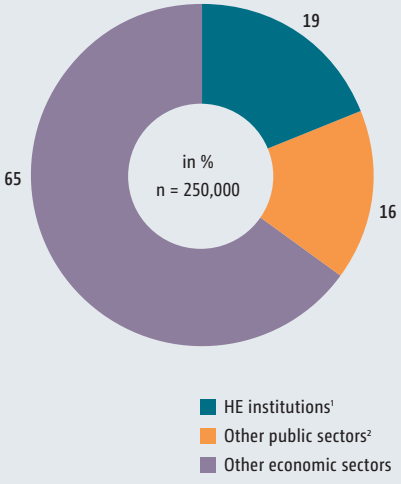
- **Factors influencing the decision to undertake doctoral studies:** The results of a literature review and analysis show that the following factors influence the probability of an undergraduate progressing to doctoral studies:
  - **Age upon completion of HE studies:** The older the student is upon completion of undergraduate studies, the less likely the progression to doctoral studies.
  - **Gender:** Male HE graduates are more likely to commence doctoral studies than their female counterparts (given otherwise similar circumstances).
  - **Performance as an undergraduate:** A positive correlation exists between a student's performance as an undergraduate – measured by degree classification – and the progression to doctoral studies.
  - **Working as a research assistant while studying:** A positive correlation exists between working as a research assistant while studying and the progression to doctoral studies.
  - **Personal preferences and perceived high level of self-efficacy:** Among the factors increasing the probability of progression to doctoral studies are a student's personal preferences for academic work and the belief that he/she possesses the necessary skill set.

B6 Career paths and prospects of junior doctorate holders

- **Doctorate holders predominantly engaged in private sector:** 65% of employed doctorate holders under the age of 45 work in the private sector, 19% in HE institutions, and 16% elsewhere in the public sector[2] (**Fig. 6**).
- **Employed doctorate holders only seldom engaged in research and development:** A total of 17% of employed doctorate holders state research and development as their predominant activity.
- **30% of professors will retire between 2015 and 2024:** The number of professors approaching retirement age can be regarded as an indicator of how many professorships at universities and equivalent HE institutions will be available in each subject group for junior scholars in the future. From 2015 to 2024, 7,866 professors will retire for age reasons (**Tab. 8**). This figure corresponds to 30% of all current professors. The

2 This last-named segment in principal also includes non-university research facilities.

Fig. 6: Employed doctorate holders under the age of 45 in 2015 by economic sector (in %)



1 Includes economic division 72 (research and development) and economic sector 85.4 (tertiary and post-secondary education, non-tertiary education).

2 Includes, alongside economic division 84 (public administration, defence and social security), which is taken into account without further restrictions, economic divisions 35 (energy supply), 36 (water energy), 37 (sewerage), 38 (waste collection, treatment and disposal activities; materials recovery), 39 (remediation activities and other waste management services), 85 (education) excluding economic group 85.4 (tertiary and post-secondary, non-tertiary education), 87 (residential care activities, excluding convalescent homes and holiday retreats), 88 (social work activities without accommodation), and 91 (libraries, archives, museums, and botanical and zoological gardens), as well as economic groups 86.1 (hospitals) and 86.9 (other human health activities) if the employee indicated that he/she was working in the public sector. Employees in other branches of the economy stating that they worked in the public sector were disregarded.

Source: Federal Statistical Office (2016): Micro census, Sonderauswertung, Wiesbaden; own graph

Tab. 8: Proportion of professors entering retirement between 2015 and 2024 by subject group (absolute figures and in %)

Subject groups	Professors working in universities (including teacher training and theological colleges) and art schools (main occupation) in 2014	Professors retiring for age reasons in the period 2015–2024	Share of the total number of professors in 2014 retiring in the period 2015–2024
	in persons		in %
Languages and cultural studies	5,798	1,735	30
Sport	245	79	32
Law, economics and social sciences	4,226	879	21
Mathematics, natural sciences	6,691	1,865	28
Human medicine/health sciences[1]	3,333	1,034	31
Veterinary medicine	[2]	73	
Agriculture, forestry and food science	448	169	38
Engineering	2,610	952	36
Art, art studies	2,825	991	35
Central facilities (excluding clinic-specific facilities)[1]	388	83	21
Central facilities of university hospitals (human medicine only)	20	6	30
Total	26,584	7,866	30

1 Excludes art schools because their figures for the subject groups human medicine and central facilities (excluding clinic-specific facilities) were not disclosed.
2 Figure unknown or confidential.

Source: Federal Statistical Office (2014): Fachserie 11, Reihe 4.4 (Wiesbaden), own table

proportion varies between 21% in law, economics and the social sciences, and 38% in agriculture, forestry and food science. Disregarding the medical disciplines (human medicine/health sciences and veterinary medicine as well as professorships in central facilities of university hospitals), the proportion of retiring professors (29%) varies only marginally across all subject areas.

- **Professorship positions dependent on research performance:** Junior scholars appear to improve their chances of being awarded a professorship if they finish a habilitation within a short period of time or at a relatively young age and are able to present a large portfolio of specialist publications. Gender does not have a significant influence on either the probability of being appointed professor or the time lapse between habilitation and appointment. A large proportion of those appointed obtain a post in the first three years after their habilitation.

- **Ratio of first professorships awarded to academics with habilitation to completed habilitations stands at approx. 1:5 (disregarding medical subjects):** In 2014, a total of 425 junior scholars with habilitation were awarded their first university professorship. In the same year 1,627 doctorate holders completed their habilitation. The ratio of first professorships awarded to academics with habilitation to completed habilitations therefore stands at approximately 1:4. Excluding the medical subjects (human medicine/health sciences and veterinary medicine), the ratio stands at 165 first appointments to 784 habilitations. The adjusted ratio is approx. 1:5.
- **Science management – a new field of activity for junior scholars:** A growing field of work for junior scholars exists at the interface between science and administration or science and management. Initial evidence collected from HE institutions indicates that around two such posts now exist for every three professorships. The results of a survey conducted for a project investigating the role of new HE professionals in shaping the teaching and studying environment indicates that around four out of five of the HE professionals responding to a questionnaire have permanent employment contracts.
- **Staff development provisions for junior scholars available practically across the board at HE institutions and non-university research facilities:** Opportunities for junior scholars to enrol in staff development activities exist in 97% of HE institutions and 86% of non-university research facilities.

Contribution of junior scholars and impacts of academic training

B7 International mobility

- **International mobility below average during doctoral studies and above average in postdoc and probationary phases:** The international mobility of German junior scholars varies significantly, depending on career phase. International benchmarking shows that the incidence of working abroad is below average among German doctoral candidates; 12% of this group have worked abroad for more than three months. Of the junior doctorate holders in Germany, 45% have worked abroad for more than three months, which is above the international average (**Figs. 7** and **8**). These two findings are taken from MORE2, the international comparative study of researchers' mobility patterns and career paths.
- **Growing proportion of foreign junior scholars at German HE institutions:** The prevalence of foreign nationals among junior scholars at German HE institutions has increased substantially in recent years – from 10,970 in 2006 to 21,513 in 2014. This means that compared to 2006, 10,543 more foreign scholars were employed by German HE institutions in 2014. The relative proportion of foreign junior scholars in Germany rose from 12% in 2006 to 15% in 2014 (**Fig. 9**).
- **Switzerland is the preferred destination for German junior scholars:** Information on the preferred destinations of German junior scholars is provided by the data of the Federal Statistical Office concerning German doctoral candidates abroad. These show that the preferred destination is Switzerland, followed by the United Kingdom and Austria.

Fig. 7: Proportion of junior academic staff who has worked abroad for more than three months during doctoral training (in %)[1]

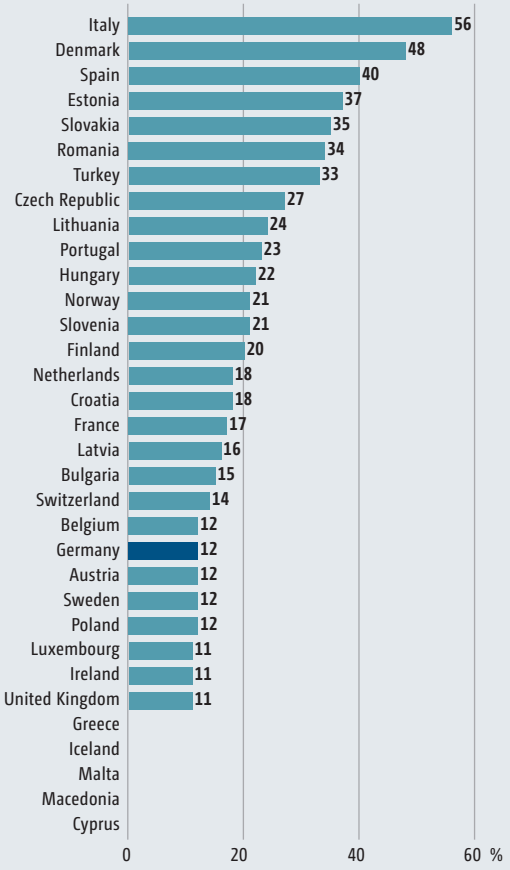
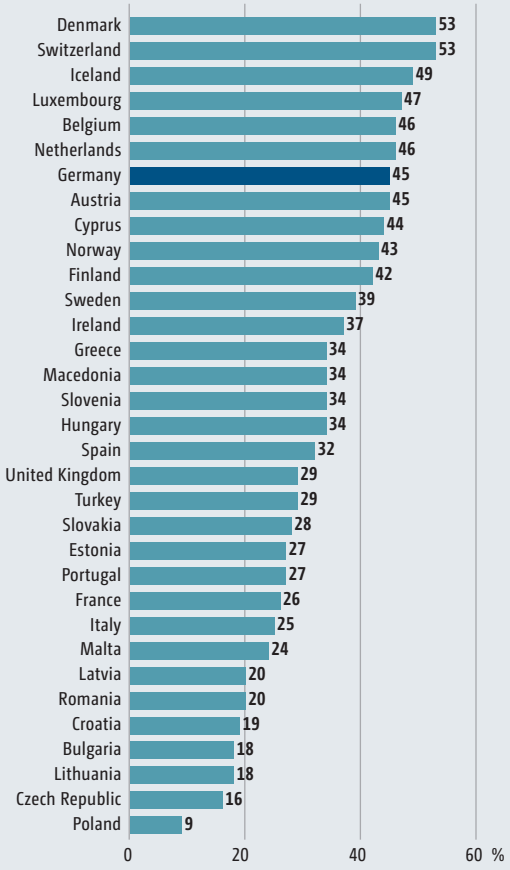


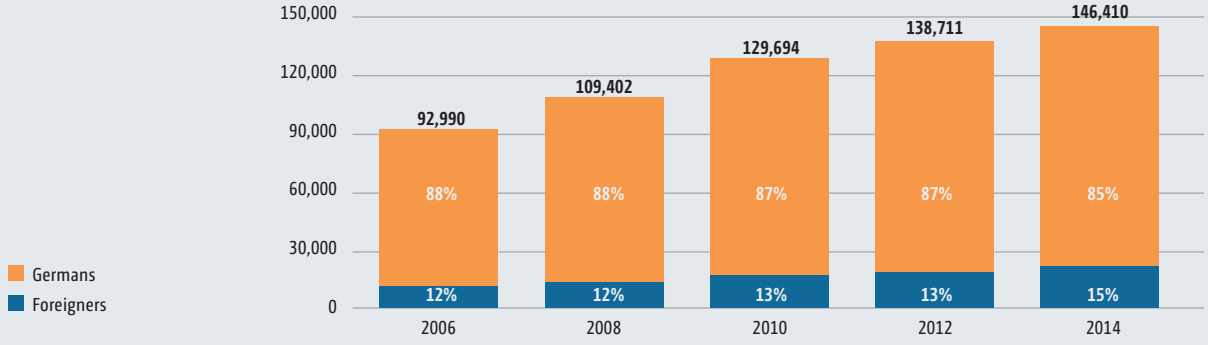
Fig. 8: Proportion of junior academic staff who has worked abroad for more than three months during their post-doc phase and in the last ten years (in %)



1 Although Greece, Iceland, Malta, Macedonia and Cyprus were included in the study, this aspect of mobility was either not collected or reported for these countries.

Source: IDEA Consult et al. (2013): Support for continued data collection and analysis concerning mobility patterns and career paths of researchers. Final report MORE2, Brussels, p. 123 f.; own graph

Fig. 9: Number of junior scholars working in German HE institutions in 2006–2014, absolute figures and by nationality (in %)[1]



1 The figures presented here refer to arts and science staff under the age of 45 employed in their main occupation or on term contracts by German HE institutions. Staff below the level of regular professors are included, consisting of junior professors, lecturers, assistants, arts and science staff, and teachers with special duties.

Source: Sonderauswertung der Hochschulpersonalstatistik des Statistischen Bundesamtes (2016); own graph

B8 Contribution of junior scholars to teaching, research and knowledge transfer

- **Junior scholars contribute significantly to teaching:** Relevant studies indicate that junior scholars make a telling contribution to teaching. According to one of these studies, 67% of doctoral candidates at universities are involved in teaching. The corresponding figure for universities of applied sciences is 65%, and for non-university research facilities it is 17%. The average teaching time of doctoral candidates is 4.2 SWS (1 SWS = 1 session of 45 minutes per week throughout a semester). Another survey indicates mean teaching hours of 5.6 SWS for junior professors, and 2.6 SWS for junior research group leaders.
- **Contribution of junior scholars to research and knowledge transfer is difficult to quantify:** The contribution made by junior scholars to research and knowledge sharing is difficult to quantify in view of the available data. Lifetime observations and further analyses on the subject matter of research achievements would be necessary in order to estimate the scholars' impact. For this purpose, however, a complete record of academics and their publications would need to be compiled to allow the contributions of junior scholars to be clearly identified.

B9 Returns on investment in education and non-monetary benefits of academic training

- **Junior scholars benefit financially from obtaining a doctorate:** The average salary of doctorate holders is higher than that of employed graduates without a doctoral degree. This finding is corroborated by several surveys and career destination studies. The income benefits accruing to female doctorate holders are 8–9% lower than those earned by men.
- **Income benefits vary by subject area:** Whereas doctorates in languages and cultural studies are associated with hardly any financial gain in many cases, doctors of law, in particular, benefit significantly from obtaining the higher degree. Compared to graduates without a doctorate, doctorate holders enjoy greater job satisfaction and report a closer match between the skills acquired through education and the skills required by their work.

C Compatibility of family life and academic career

C1 Definition

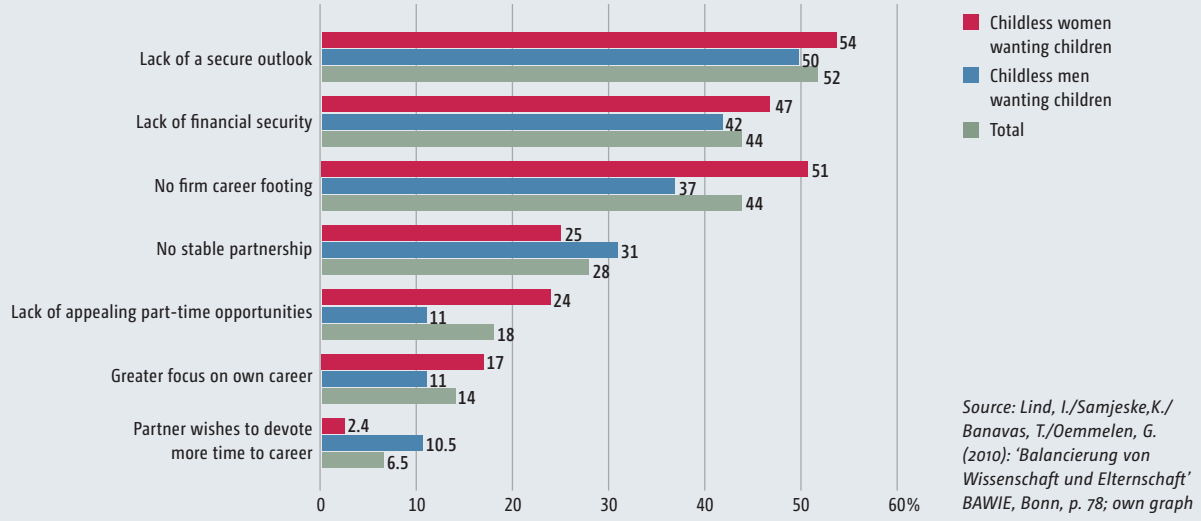
- **Striking a balance between an academic career and family life presents a challenge to both genders:** In this section of the report exploring a particular aspect of junior scholars' circumstances, the compatibility of family life and an academic career is viewed as a challenge for both genders in principle. In this context, the term „family" refers not exclusively to parenthood, but generally to all situations in which responsibility for others is accepted in the private sphere.

C2 Empirical findings on compatibility of family life and academic career

- **Junior scholars with children:** No representative data are currently available on the proportion of junior scholars in Germany who are parents. The most reliable sources indicate a ratio of around 13 to 30%.
- **More junior scholars than other HE graduates remain permanently childless:** Current data are likewise lacking data about permanent childlessness among junior scholars. An analysis of official data from 2006 indicates, however, that 49% of female academic assistants and 42% of their male counterparts at universities ultimately remain childless.[3] Among male and female HE graduates of the same age the proportion is estimated to be around 25%.
- **Junior scholars strongly desire children:** Most junior scholars wish to have children. In a survey, only 12% of young academics without offspring expressed a desire to remain childless.
- **Career reasons play a major role in decisions to defer family formation:** Junior scholars cite the lack of a secure outlook and firm career footing, as well as the financial uncertainty that accompanies an academic career, as the principal reasons for postponing the wish to raise a family (**Fig. 10**).
- **Work/family balance perceived as neither especially difficult nor especially easy to achieve:** Surveyed junior scholars regard a career within a HE institution as a highly attractive prospect. However, junior scholars judge that achieving a healthy work/family balance is neither especially easy nor especially difficult to achieve. Among the identified difficulties are the exacting work and mobility requirements, the demands of forming a family and obtaining academic qualifications at the same time, and the lack of childcare options (see **Fig. 11**).
- **Parents no less satisfied than childless academics:** There is even a tendency for junior scholars with children to be more satisfied with their current work/life balance, and less stressed, than their childless counterparts. In addition, surveyed junior scientists with children agree less often than childless scholars with the statement that an academic career and family life are barely compatible (30% versus 37%).

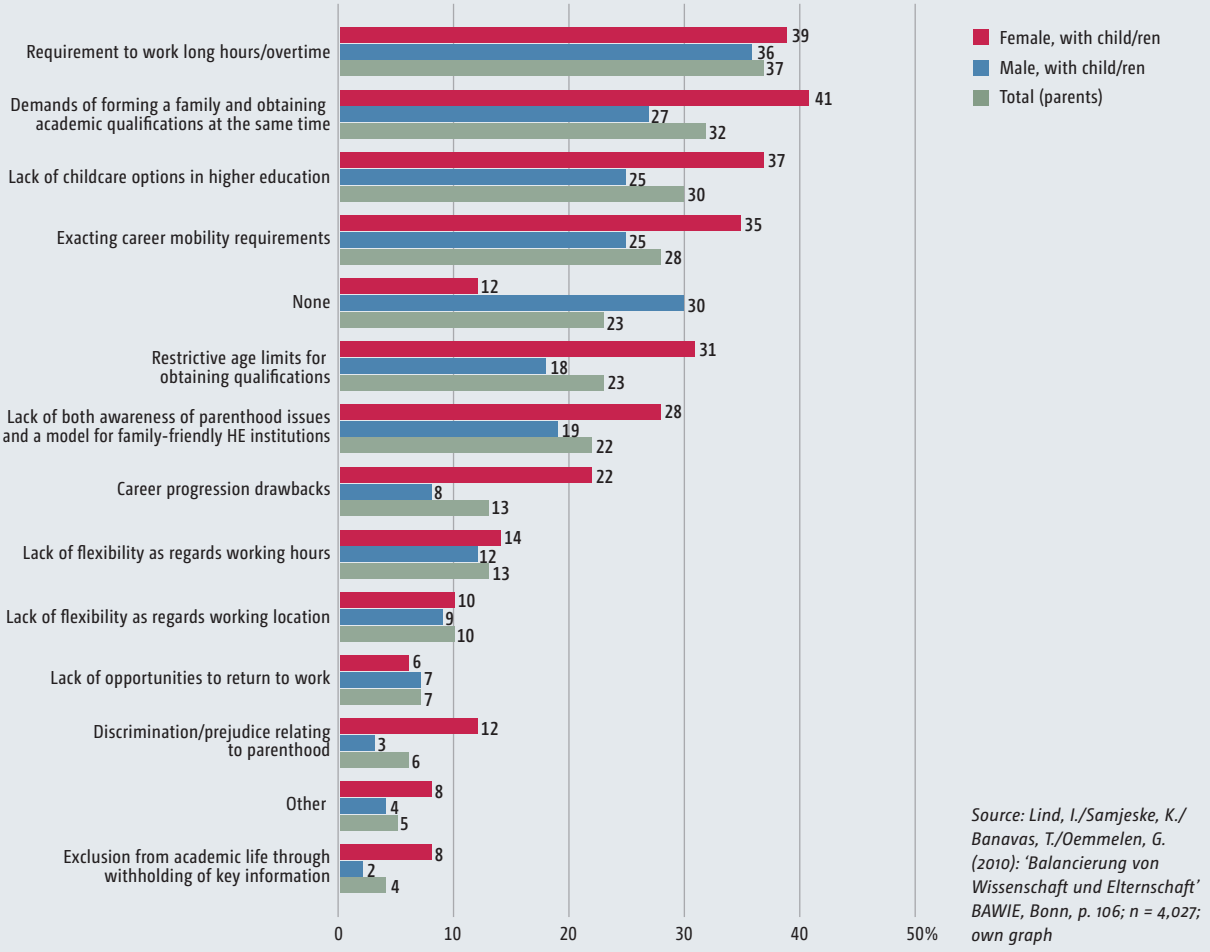
3 The relevant study is based on the proportion of 43- to 53-year-olds without children. Childlessness at this age is generally considered permanent, given the unlikelihood of family formation any later in life.

Fig. 10: Barriers for realising wish for children by gender (selection) (in %)



Source: Lind, I./Samjeske,K./ Banavas, T./Oemmelen, G. (2010): 'Balancierung von Wissenschaft und Elternschaft' BAWIE, Bonn, p. 78; own graph

Fig. 11: Difficulties in striking a balance between family life and an academic career at a university by gender (in %)



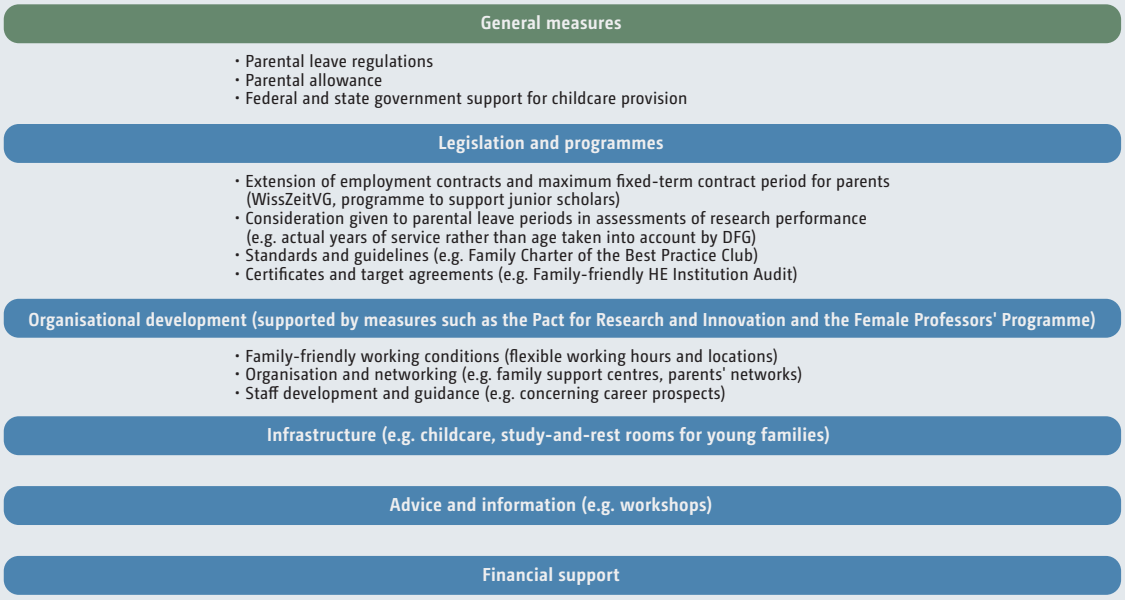
Source: Lind, I./Samjeske, K./ Banavas, T./Oemmelen, G. (2010): 'Balancierung von Wissenschaft und Elternschaft' BAWIE, Bonn, p. 106; n = 4,027; own graph

- **Parenthood sometimes linked to career goals:** HE graduates with children generally tend to be less likely to commence doctoral studies than those who do not have children. For those who are already enrolled in a doctoral programme, however, the picture is a little different. Giving consideration to relevant individual and structural parameters, doctoral candidates who are also fathers are more likely than their childless counterparts to pursue an academic career. For both female junior scholars in general and junior scholars holding a doctoral degree there is no evidence indicating a correlation between parenthood and the likelihood of pursuing an academic career.
- **Career implications of parenthood:** Surveys show that women in particular identify parenthood with adverse career implications. They report more frequently than fathers (to be) not only to be held back in their careers by line managers, but also to receive less acknowledgement for their academic work. The actual effects of parenthood on the academic careers of junior scholars cannot be reliably estimated at present in view of the limited data available. Individual findings indicate, however, that in academia parenthood is more likely to be associated with adverse career consequences for women than for men.
- **Reasons for gender differences in the rating of family/academic career compatibility:** Compared to men, there is a greater tendency among women to regard family life and a career as less compatible, and women are more frequently confronted with negative consequences of parenthood. These findings are frequently attributed to partners' domestic arrangements. Women interrupt their employment after the birth of a child more often than men, and they are more likely to assume the main responsibility for family and household duties.
- **Need for further research remains acute:** There remains a great need for data to be collected and research to be conducted on the subject of family/academic career compatibility. An urgent requirement appears to exist for a longitudinal analysis of the actual career paths of junior scholars with and without children, and for a systematic comparison with HE graduates of the same age who are employed outside the HE and non-university research sector.

C3 Family and higher education policy steering instruments, programmes and measures

- **Broad range of general family policy measures alongside specific provisions for junior scholars:** Junior scholars are among those who benefit from general family policy steering instruments, including parental leave regulations and benefit payments, as well as state-subsidised childcare (**Fig. 12**). They also have access to special measures, such as flexible working hours, study-and-rest rooms for young families, regular childcare provisions, workshops and coaching sessions addressing the issue of work/life balance, as well as advisory support for those who are caring for family members.
- **Measures adopted by HE institutions largely meet parents' needs:** It can be assumed that the measures adopted by HE institutions and non-university research facilities improve the everyday lives of parents in particular, and therefore their immediate experience of the academic work/life balance. Even in the absence of extensive evaluations of these measures, individual surveys show that the adopted provisions meet the needs of junior scholars to a very large extent.

Fig. 12: Steering instruments, programmes and measures to improve the academic work/life balance for families and HE institutions



Source: Own graph, following Kunadt, S./Schelling, A./Brodesser, D./Samjeske, K. (2014): Familienfreundlichkeit in der Praxis. Ergebnisse aus dem Projekt "Effektiv!"- Für mehr Familienfreundlichkeit an deutschen Hochschulen. cews.publik, Cologne

- **Insufficient awareness of existing measures:** A critical view must be taken, given that the target groups are not sufficiently aware of many of the measures adopted by HE institutions and non-university research facilities, and that a fairly large proportion of junior scholars claim to have received no institutional support in achieving a good work/life balance.

D Outlook: Improving availability of data on junior scholars, and current policy developments

D1 Further expansion of database relating to junior scholars

- **Major data changes to improve future monitoring of junior scholars:** The availability of data to facilitate the monitoring of junior scholars in the future is expected to improve significantly in Germany. The amendment to the Higher Education Statistics Act (HStatG), in particular, will have the effect of broadening and refining the pool of official data. The availability of data concerning junior scholars will be further improved by other projects and initiatives, such as the UniWiND-Koordinierungsstelle Nachwuchsinformationen which, among other things, is supporting the endeavours of universities to capture information about their doctoral candidates electronically according to a uniform standard.
- **Amendment to the Higher Education Statistics Act:** The amendment to HStatG came into force on 1 March 2016. It introduces new data collection parameters for the statistics on students, examinations and staff, as well as flow statistics for students and doctoral candidates. This legislative revision is expected to deliver more accurate information on the award of doctorates, qualification procedures, and prior qualifications in case of new appointments, and to allow a distinction to be made between doctoral candidates and doctorate holders, for instance when evaluating working and employment conditions.
- **Indicator model relating to junior scholars:** Apart from the presentation of existing key data, previously lacking indicators were developed in the indicator model for the purposes of reporting on junior scholars. Existing gaps in data availability were described, and strategies for capturing the relevant data were outlined.
- **Core data set on research activities:** The German Council of Science and Humanities has initiated, and accepted responsibility for defining a core data set on research activities with operational support from the Institute for Research Information and Quality Assurance (iFQ, now DZHW). The project is seeking to define a data set stipulating which data are to be collected by HE institutions and non-university research facilities and thus to develop a standard for data collection in order to ease their reporting on research activities and scientific staff.
- **State governments and HE institutions also adopting measures to collect data on junior scholars:** Further initiatives seeking to improve the data situation relating to junior scholars are reflected in decisions adopted by state governments to expand data collection in HE institutions, in measures introduced by HE institutions to focus their data gathering activities, and in research projects that are being pursued as longitudinal studies. One example is provided by a resolution of the Vice-chancellors' Conference in Baden-Wuerttemberg, in which the systematic and uniform recording of doctoral degree awards and doctoral study conditions in all of the state's HE institutions was agreed. This recording of key characteristics exceeds the obligation to provide information according to the amended higher education statistics regulations. The

data collection activities of the HE institutions in Baden-Wuerttemberg align with recommendations of the German Council of Science and Humanities, as set forth in its 2011 white paper describing quality assurance requirements relating to doctorates, and of the German University Association of Advanced Graduate Training (UniWiND) in a memorandum produced in 2015 by its working party on the collection of data relating to doctoral candidates.

D2 Selected measures and their significance for junior scholars

- **Major legislative amendments and policy programmes:** The establishment of key legislative amendments as well as policy programmes and measures taken by HE institutions and non-university research facilities in recent years are improving the situation of junior scholars.
- **Programme to support junior scholars:** The aim of this support programme is to introduce tenure track professorships in universities throughout Germany and thus to establish an internationally more familiar and accepted career path. For this purpose the programme is supporting an additional 1,000 tenure track professorships that will be sustained beyond the ending of the programme, as well as an equal number of additional permanent professorships.
- **Amendment to the Law on Fixed-term Contracts in Higher Education and Research:** Among other things, the amended WissZeitVG stipulates that time limits applied to short-term employment serving the purpose of enabling the employee to reach qualification objectives must be commensurate with the relevant qualification. Time limitations applied on the basis of external funding are to reflect the approved project duration.
- **Excellence Initiative and Strategy:** The continuation of the federal government's Excellence Initiative (Excellence Strategy) is laying the foundations for engagement in cutting-edge research. It gives junior scholars the opportunity to obtain the necessary qualifications, raise their profiles and establish networks in the clusters of excellence supported by the Initiative.
- **Higher Education Pact 2020 and Pact for Research and Innovation:** These administrative agreements between the federal government and the states give HE institutions and non-university research facilities the financial planning security required to employ junior scholars.
- **HE institutions and non-university research facilities continue to refine personnel structures:** Action is being taken by HE institutions and non-university research facilities to enhance both the planning of academic career pathways and the working and employment conditions of junior scholars. Among the measures adopted in this context are personnel concepts that specifically improve the planning of academic career pathways – for instance tenure track professorships and permanent posts for non-professorial teaching and research staff. HE institutions have also refined their guidelines on personnel and staff structure development, which, among other aspects, contain recommendations concerning fixed-term employment practices and career planning advice for junior scholars.

D3 Future monitoring of junior scholars

- **Relationships between monitoring and quality assurance measures:** In summary, current developments relating to the collection of data will significantly improve the monitoring of junior scholars in future. Thanks to the shape of the various current programmes and measures, as well as legislative amendments, the topics identified in this report are being addressed with a view to enhancing the situation of junior scholars. It can be concluded from these trends that the problems actually encountered by junior scholars will be more precisely recorded in the future, and that the responsible authorities will be able to respond to such problems with more suitable policy measures and solutions. The relationships between monitoring activities and quality assurance measures are expected to remain a crucial factor in facilitating evidence-based policy measures.

2017 National Report on Junior Scholars

Statistical Data and Research Findings on Doctoral Students and Doctorate Holders in Germany

This report focuses on the training and career development of researchers from initial graduation through to their doctorate, and follows their progression in the subsequent phase of further academic training and activity through to the transition to permanent employment in the academic or non-academic labour market. In particular, the BuWiN 2017 focuses on the compatibility of family life and an academic career, which is analysed in a separate chapter.

The report is primarily based on official statistics and information collected by regular surveys. To a greater extent than in the past, the data have been prepared to facilitate comparisons and put the findings in context. The report thus produces a body of empirical basic knowledge for academics, serves as a relevant steering instrument for the federal and state governments as well as scientific institutions and funding organisations. Further, the report serves as a point of reference for young scholars themselves.

INSTITUT FÜR INNOVATION UND TECHNIK

DZHW Deutsches Zentrum für Hochschul- und Wissenschaftsforschung

IHF Bayerisches Staatsinstitut für Hochschulforschung und Hochschulplanung

Institut für Hochschulforschung HoF an der Martin-Luther-Universität Halle-Wittenberg

INCHER-KASSEL International Centre for Higher Education Research Kassel

DESTATIS Statistisches Bundesamt

W. Bertelsmann Verlag

wbv.de