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Deutscher Akademischer Austauschdienst
German Academic Exchange Service

Wissenschaft weltoffen

Facts and Figures on the International Nature of Studies and Research in Germany and Worldwide

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DZHW German Centre for Higher Education Research and Science Studies

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2021

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FOREWORD

Internationalisation is a prerequisite for the improvement of teaching and research at universities. To this end, empirical surveys are regularly carried out to assess the international nature of the German higher education system and keep policymakers and society fully informed. In this context, *Wissenschaft weltoffen* has become established as an **essential source of information on student and researcher mobility**.

Internationalisation is a highly dynamic field of activity. As such, we are constantly updating the design of *Wissenschaft weltoffen* and the data we provide in it, as well as adapting the content to the latest developments. This edition therefore features a renewed focus on **the impact of the global Covid-19 pandemic on university internationalisation.** The first data and analyses are now available, enabling us to offer a better assessment of the "Covid-19 effect" on certain aspects of international academic mobility, particularly with regard to Germany.

For last year's 20th edition, the DAAD and DZHW have therefore fundamentally revised the format of the publication. The former Focus chapter has been replaced with an increased number of Spotlights, which are continued from previous editions. Spotlights allow us to explore key issues in more depth, while retaining a clear and concise format. This year's edition focuses three spotlights on ways in which the Covid-19 pandemic has impacted the international mobility of students and teachers. In place of a single bilingual main edition, there are now separate editions in German and English, as has previously been the case for the compact edition. This opens up more space to explain and interpret data, making it easier for readers in Germany and abroad to access the information provided by *Wissenschaft weltoffen*.

The 21st edition also includes a number of other improvements. For the first time, *Wissenschaft weltoffen* includes **our own bibliometric data on the international mobility of academics and researchers** in Chapter A, collected by the bibliometric data experts at the DZHW. This change allows us to update these data annually in future and focus them more closely on the needs of our readership than we were previously able to do using data from the OECD. In order for our readers to understand the methodology of bibliometric mobility analysis, we have added a Spotlight to the chapter, explaining how the data were collected and what should be borne in mind when interpreting them. For example, bibliometric data mobility analyses generally do not cover most cases of short visits abroad.

The **new *Wissenschaft weltoffen* website** represents another major improvement. As before, it can be accessed at www.wissenschaft-weltoffen.de. The new website allows users to download any figure from the various editions (main and compact editions, German and English) as an image or table. Moreover, *Wissenschaft weltoffen* online is now barrier-free, giving readers with disabilities easy access to the diverse range of information contained on the website. We plan to keep expanding the functionality and services of our new website over the next few years. We would be delighted to receive your feedback about the new website.

The **DAAD and the DZHW would like to thank** Ms Christiane Zay and wbv Media publishing house for the graphic design and realisation. We would also like to express our special thanks to the Federal Statistical Office Germany, the science organisations, the research institutes and other institutions that have provided information and data for *Wissenschaft weltoffen 2021*, as well as to the Federal Foreign Office and the Federal Ministry of Education and Research, whose grants have made it possible to fund the publication.

It is with great gratitude that we remember **Marion Schnepf**, *Wissenschaft weltoffen*'s graphic designer for many years, who died shortly after the last edition went to print. Through her work, Ms Schnepf profoundly influenced the look and feel of *Wissenschaft weltoffen* over the course of almost 20 years from the first edition onwards. Her remarkable skill, commitment and unfailingly friendly collaboration made a profound contribution to the success of the project.

Dr. Kai Sicks
Secretary General of
the DAAD

Prof. Dr. Monika Jungbauer-Gans
Scientific Director of
the DZHW

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To accompany this publication, further information is available online under the following address: **https://www.wissenschaft-weltoffen.de/en**.

This includes additional tables, information on other evaluation options and a comprehensive glossary. You will also find a linked PDF document of this publication. Relevant data sheets on the various figures can be downloaded by clicking the ⬇ symbol.

In addition, the DZHW maintains a service point, which advises parties on evaluating this data pool according to their individual requirements and also carries out such evaluations on request. This service is available to universities free of charge.

Please address enquiries to **wissenschaft-weltoffen@dzhw.eu**

D INTERNATIONAL ACADEMICS AND RESEARCHERS IN GERMANY

E GERMAN ACADEMICS AND RESEARCHERS ABROAD

METHODOLOGY

SUMMARY: DEVELOPMENT OF THE INTERNATIONALITY OF STUDIES AND RESEARCH IN GERMANY AND WORLDWIDE

The Covid-19 pandemic and its impact on international student mobility in Germany

The Covid-19 pandemic, which broke out at the beginning of 2020, caused trends in the international mobility of students, academics and researchers to decline sharply. Although it is still not possible to assess the overall impact of the restrictions, over a year after the beginning of the pandemic, we can now sketch a slightly more detailed picture of the pandemic's influence on international student mobility in Germany (see Chapters B and C: Spotlights).

> "There was no decline in the overall number of international students in Germany, either in the 2020 summer semester or in the 2020/21 winter semester; indeed, the number rose slightly in both cases.

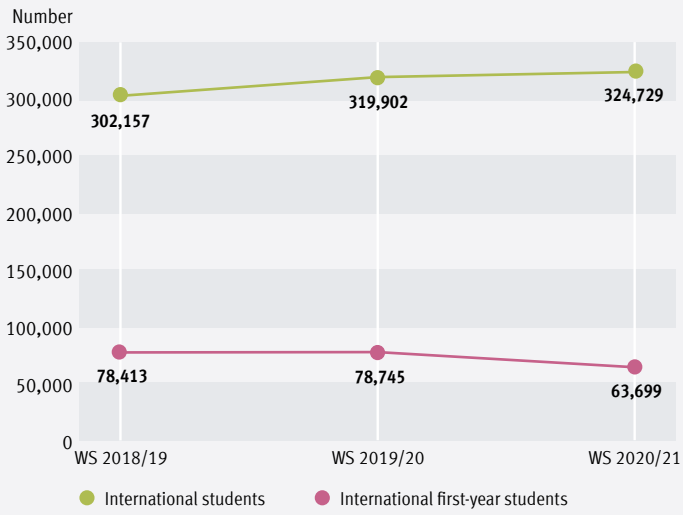
What is now clear is that there was no decline in the overall number of international students in Germany, either in the 2020 summer semester or in the 2020/21 winter semester; indeed, the number rose slightly in both cases. However, there were severe declines in the numbers of international first-year students, which fell by 41% in the summer semester and 19% in the winter semester. Yet these declines mainly concerned visiting and exchange students and not international first-year students who intended to complete their degree course in Germany, where the effect was much smaller. Moreover, the declines affected different countries of origin to greatly varying degrees.

The data available on the international mobility of students in Germany so far only allow reliable statements on the effects of the pandemic for temporary study-related mobility. For example, there was a decline of around 50% in Erasmus stays in 2020, compared to the pre-pandemic year 2019. However, this decline was not evenly distributed across the whole year, affecting the second half of the year much more significantly (–57% in contrast to –34% for the first half of the year). Visits for study purposes and placements were affected by the declines to roughly equal extents. However, there were much higher levels of short-term cancellations and postponements affecting study visits that had already been applied for than placement visits, presumably due to cancellations on the part of the respective host universities.

International academic mobility and cooperation (Chapter A)

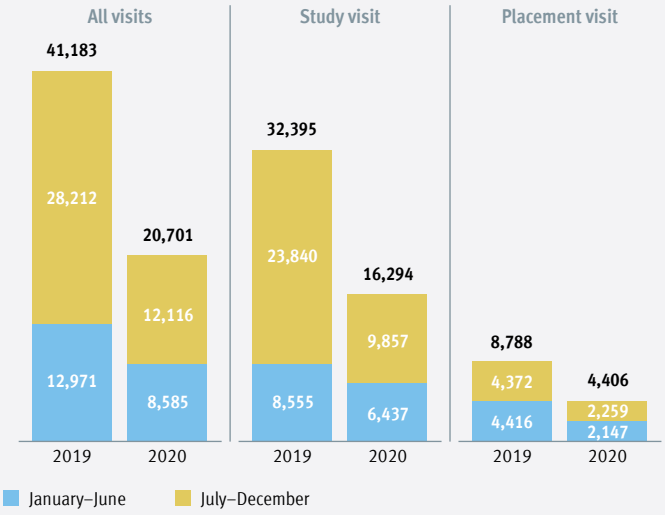
According to UNESCO, around 5.6 million students were enrolled outside their home countries in 2018. This corresponds to an increase of around 240,000 international students, or 4% compared to the previous year. The number of internationally mobile students has increased by around 2.2 million, or 68%, since 2008. The US is by far the most important host country for international students. Around 987,000 international students were enrolled in the US in 2018, accounting for 18% of all internationally mobile students worldwide. The largest flows of international student mobility therefore lead from China, the key country of origin by a clear margin, to the US but also to the other host countries, the United Kingdom, Australia and Japan. In 2018, around 1 million students from China were enrolled at universities abroad. These students alone represent 19% of all internationally mobile students worldwide.

1 International students and first-year students in Germany, since WS 2018/19



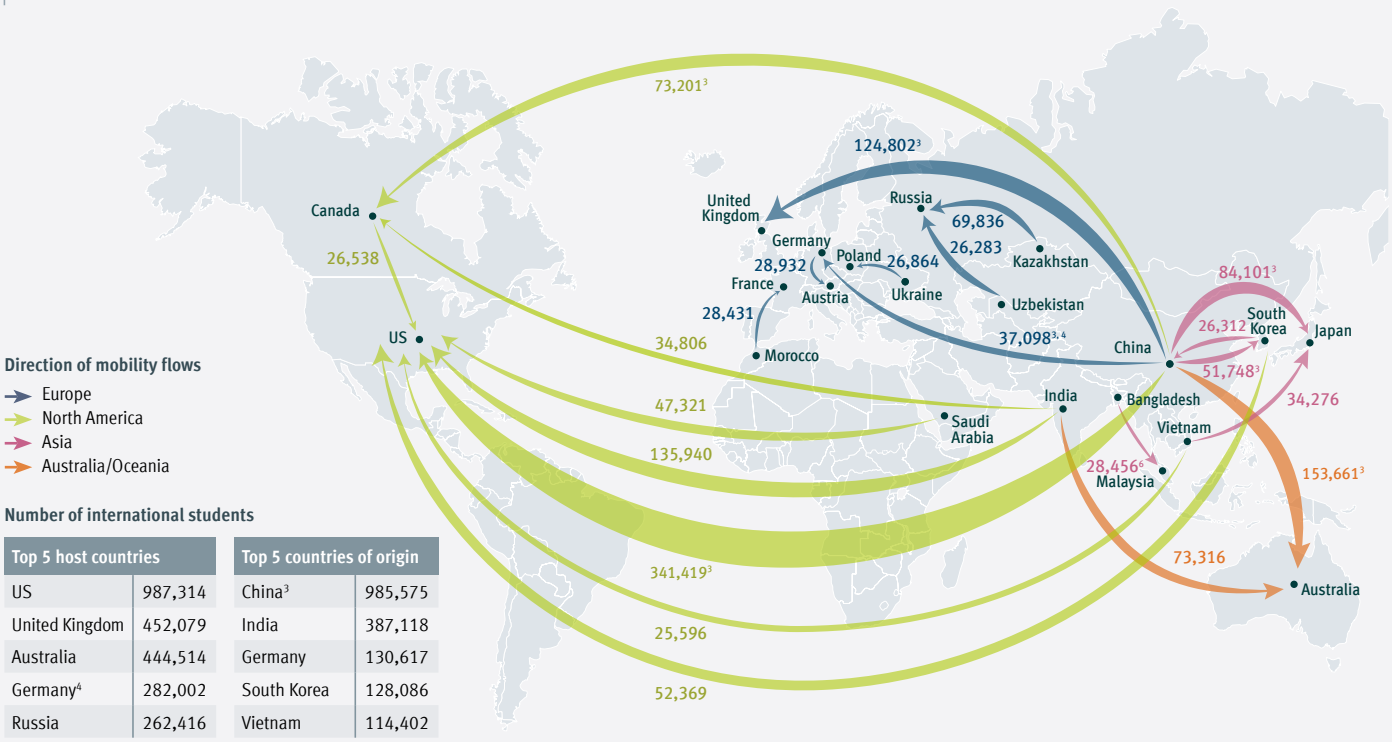
Source: Federal Statistical Office, student statistics

2 Number of standard Erasmus visits undertaken by students from Germany, by type of visit and six-month period, in 2019 and 2020[1]



Source: DAAD, Erasmus statistics; DAAD calculations

3 Flows of internationally mobile students between major host countries and countries of origin, in 2018[2]



Number of international students

Top 5 host countries		Top 5 countries of origin	
US	987,314	China[3]	985,575
United Kingdom	452,079	India	387,118
Australia	444,514	Germany	130,617
Germany[4]	282,002	South Korea	128,086
Russia	262,416	Vietnam	114,402

Figures for absolute numbers of students

Sources: UNESCO/Federal Statistical Office student statistics; state-level reporting periods; DAAD calculations

The data available on internationally mobile academics and researchers at host universities abroad are significantly poorer than the data on internationally mobile students. To date, there are no internationally comparable UNESCO or OECD statistics

> “According to UNESCO, around 5.6 million students were enrolled outside their home countries in 2018, an increase of 4% over last year.

on this, unlike for worldwide student mobility. Looking at the 15 host countries for which data could be collected for *Wissenschaft weltoffen*, the US, with around 135,000 international academics and researchers at US universities, proves to be by far the most important host country. It is followed by the United Kingdom (around 65,000), Germany (around 48,000), Switzerland (around 29,000) and France, whose universities and non-university research institutes employ only around 15,000 international academics and researchers.

Transnational education (TNE) designates a sub-area of internationalisation in which universities from one country bear academic responsibility for study programmes in another country, aimed at prospective students from that country. German universities have presences in transnational education projects at 55 locations in 32 countries worldwide, offering 328 study programmes. The number of students enrolled in German TNE programmes increased from around 26,000 to around 35,000 between 2015 and 2020. However, in 2020 the first decline in the number of international students occurred, although it was very slight, at only 1%. In regional terms, German TNE projects emphasise North Africa and Middle East (Egypt, Jordan, Oman, Turkey) and Asia (China, Vietnam, Singapore, Kazakhstan, Kyrgyzstan).

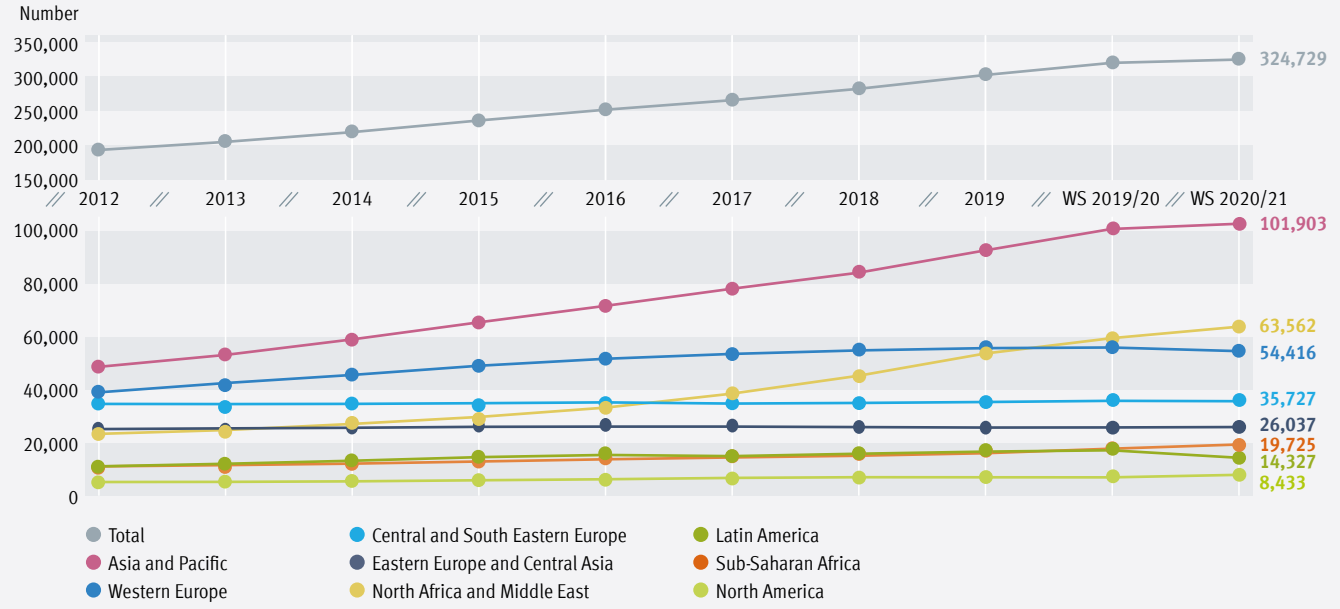
International students in Germany (Chapter B)

The number of international students at German universities continued to rise in the 2019/20 winter semester, with around 319,900 international students enrolled in Germany at that time. This amounts to 6% more than in the previous year. They accounted for 11.1% of all students, the highest percentage ever recorded by international students at German universities. This figure is 12.7% at universities and 8.4% at universities of applied sciences. In 2019, the number of international first-year students also continued to grow by 1% to around 111,000.

The Asia and Pacific region is the key region of origin for international students, with a share of 31%, followed by North

SUMMARY: DEVELOPMENT OF THE INTERNATIONALITY OF STUDIES AND RESEARCH IN GERMANY AND WORLDWIDE

4 International students in Germany, by region of origin, since 2012



Source: Federal Statistical Office, student statistics

Africa and Middle East with a share of 19%, and Western Europe with a student share of 18%. The number of students from North Africa and Middle East has grown by 77% in the last three years, significantly faster than for other regions. Central and South Eastern Europe as well as Eastern Europe and Central Asia have not recorded any increases. The key country of origin is China, with 41,400 students enrolled in Germany. These account for 13% of all international students in the country. In second and third place are India, with around 24,900 (8%), and Syria, with around 15,900 students (5%). The number of Syrian students has increased by 213% in the last three years.

8% of international students in Germany are exchange students or other visiting students who do not intend to complete their studies in Germany. Thus, the overwhelming majority (92%) of international students intend to achieve a degree at universities in Germany. 38% intend to complete a bachelor's degree and 39% a master's degree. The share of international students among all master's students is around 21%, while 7% of bachelor's students come from abroad. Junior international academics and researchers make up 25% of doctoral students.

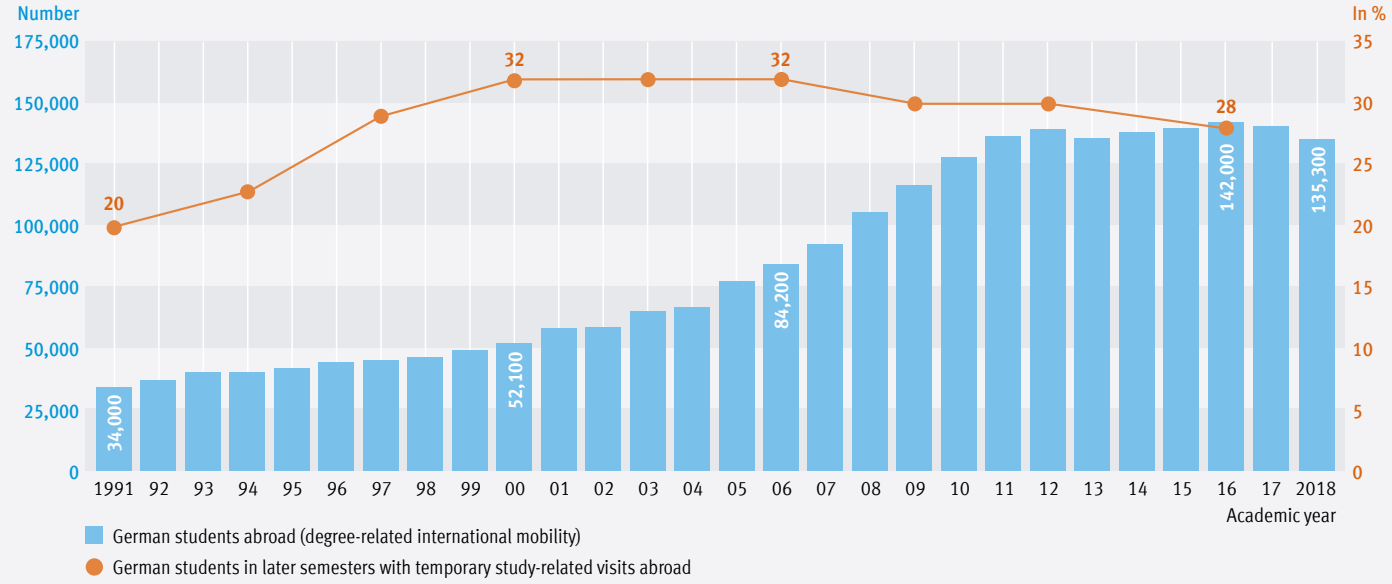
The largest group of international students (around 41%) are enrolled on engineering courses. Around 26% are studying a subject related to law, economics and the social sciences. Accordingly, these two subject groups also represent the majority of the approximately 48,200 international graduates (38% and 28% respectively) who graduated in 2019. A total of around 9% of all university graduates come from abroad. They account for 19% of all graduates with a doctorate and 17% of all graduates with a master's degree. In the bachelor's programmes, international graduates constitute for 5%.

> "In the 2019/20 winter semester, international students made up a record share of all students at German universities, accounting for 11.1% of the total.

German students abroad (Chapter C)

Around 135,000 Germans were studying abroad in 2018, representing a fall of around 5% from the 142,000 who were studying abroad in 2016. The vast majority (around 90%) of these students also intended to complete a degree abroad. The most popular host countries are Austria (around 29,000 students or 22% of all students abroad), the Netherlands (21,000 or 16%), the United Kingdom (15,000 or 11%) and Switzerland (11,000 or 9%). Looking at the trends in the overall figures, it becomes clear that between 2002 and 2010, when the new tiered degree system was being introduced, above-average growth rates of 10% and more were achieved per year. During this period, German students abroad rose as a proportion of all German students from 3.4% to 6.0%. This indicates that many students have made use of the option opened up by the new study system to complete a master's programme abroad following a bachelor's programme in Germany, and continue to do so. However, once the introduction of the new types of degrees had been completed, absolute numbers of

5 Degree-related and temporary study-related international mobility of German students, since 1991



Sources: Federal Statistical Office, "Deutsche Studierende im Ausland", country-specific reporting periods; DSW social surveys 1991–2016

German students abroad stopped rising. Indeed, as a share of all German students, their numbers have actually fallen slightly since 2015, down to 5.0% at present. This is also partly due to rising numbers of German students studying in Germany.

> "Around 135,000 Germans were studying abroad in 2018. That number has dropped by 7,000 (5%) since 2016.

A similar trend can be seen in the number of temporary study-related visits abroad by German students. Between 1991 and 2000, the percentage of students who undertook temporary study-related stays abroad rose sharply (from 20% to 32%) and stabilised at this level until 2006. This figure had fallen to 30% by 2009 and 2012, before dropping further to 28% in 2016. In contrast to degree-related international mobility, the introduction of the two-cycle degree system with bachelor's and master's programmes was therefore not associated with an increase in temporary study-related mobility. Instead, there was even a certain decline in temporary study-related mobility during this period. There are also clear differences in host country preferences for degree-related mobility, with the United Kingdom in first place (10%), followed by the US (9%), France and Spain (8% each).

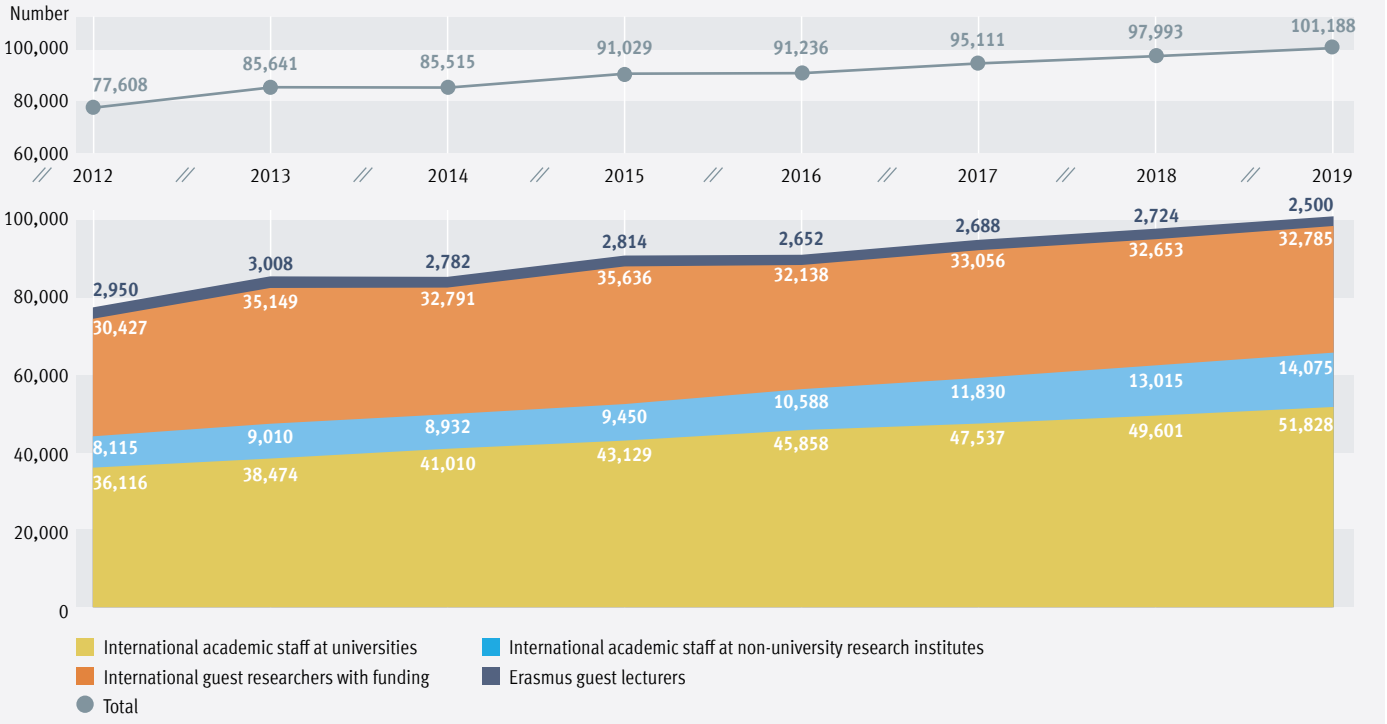
International academics and researchers in Germany (Chapter D)

In 2019, around 51,800 academic and artistic staff of foreign nationality were employed at German universities, including around 3,500 international professors. International staff thus accounted for 12.7% of all academic staff but only 7.2% of professors. Since 2007, the number of all international academic staff at German universities has risen continuously, increasing by 13% in the last three years alone. In the case of international professors, the increase over the same period was 9%. Western Europe is the key region of origin for international academic staff. 35% of all international academic staff come from Western European countries, rising to 66% for international professors. In this regard, Italy, China, India and Austria are the key countries of origin. Most international professors come from the two German-speaking countries: Switzerland (9%) and Austria (20%).

In 2019, the four largest non-university research institutes (NURIs) employed around 14,100 academics and researchers of foreign nationalities. Since 2010, their number has more than doubled (+107%), such that in 2019, around 28% of all academics and researchers came from abroad. EU countries account for 42% of the foreign academics and researchers, while 13% come from other European countries. The key countries of origin are China (9%), Italy and India (8% each). International academic staff at NURIs are highly qualified: around 49% of the academic staff are doctoral candidates and one in five research group or institute directors come from abroad.

SUMMARY: DEVELOPMENT OF THE INTERNATIONALITY OF STUDIES AND RESEARCH IN GERMANY AND WORLDWIDE

6 International academics and researchers in Germany, by type of mobility, since 2012



Sources: Federal Statistical Office, university staff and NURI staff statistics; information from funding organisations; DAAD Erasmus statistics

In addition to full-time international academic staff, international guest researchers whose visits are funded by domestic and foreign organisations also conduct research and teach in Germany. In 2019, this amounted to around 32,800 visits. This figure has changed only slightly since 2016. Of the guest visits, no less than 47% were funded by the DFG and 38% by the DAAD. Accounting for 22% and 20% respectively of all international guest researchers, Western Europe and Asia and Pacific are the key regions of origin, while China (7%), India and Italy (6% each) are the three key countries of origin. The NURIs also promote visits by international guest researchers. The Max Planck Society and the Helmholtz and Leibniz Associations together have supported the visits of around 11,300 international guest researchers. Data on this are not yet available for the Fraunhofer-Gesellschaft.

> “In 2019, around 51,800 academics and artistic staff of foreign nationalities were employed at German universities, including around 3,500 international professors.

German academics and researchers abroad (Chapter E)

Only a few countries currently record the number, origin and status of international academics and researchers employed at their universities. Data of this kind are presently available for the United Kingdom, the Netherlands, Austria and Switzerland. Most German academics and researchers are employed in Switzerland (around 8,600), the United Kingdom (around 5,700) and Austria (around 5,400). This aligns with the number of German professors: Switzerland again leads the way with around 1,300, followed by Austria with around 830 and the United Kingdom with around 820 German professors. In each of these countries, German professors make up a higher proportion of all international professors than German academics and researchers of all international academics and researchers. German professors constitute the largest share of all international professors in Austria, at 71%, and account for 46% of all international professors in Switzerland.

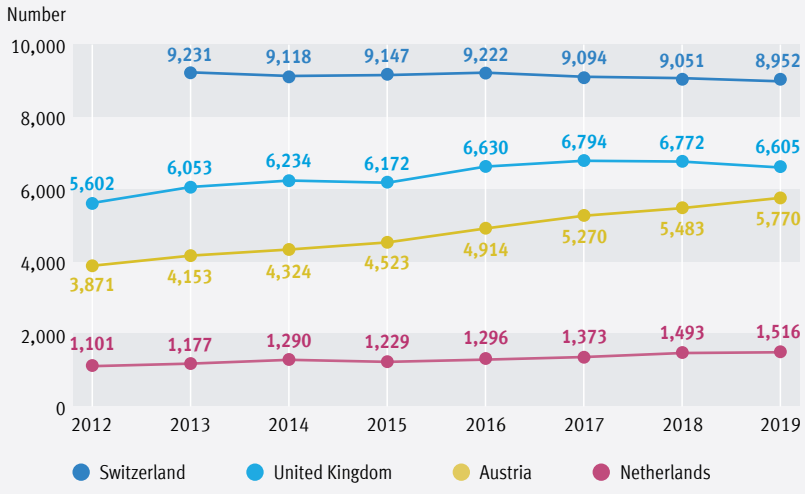
Around 13,700 early career German academics and researchers were enrolled for doctorates at foreign universities in 2018. The overwhelming majority (76%) completed their doctorates in Western Europe. Most German doctoral students conducted their research in Switzerland (25%), Austria (16%), the United Kingdom (15%) and the US (4%). For quite a substantial number of German academics and researchers studying for their doctorate in Germany, temporary visits abroad are also an important part

of their doctoral period. In 2019, 28% of all doctoral students at a German university had completed at least one doctoral-related temporary visit abroad. 55% of these visits took place within Western Europe. However, the key host country is still the US (13%), followed by the United Kingdom (9%) and France (8%).

> “Most German academics and researchers employed abroad work in Switzerland (around 8,600), the United Kingdom (around 5,700) and Austria (around 5,400).

These and other temporary guest visits by German academics and researchers abroad were funded by domestic and foreign organisations. In 2018, this involved a total of around 13,400 visits. Compared to last year, the number of guest lecturers decreased by 8%. Around three quarters of the visits were funded by the DAAD. Western Europe is the key host region for German guest researchers (26%). Other major host regions are North America (18%) and Asia and Pacific (17%). By a clear margin, the key host countries for German guest researchers abroad are the US (15%), followed by the United Kingdom (6%) and France (4%).

7 German academics and researchers in selected countries, by type of mobility, in 2019 and total numbers since 2012



Sources: National data from respective statistical agencies; data from funding organisations; DAAD Erasmus statistics; DZHW calculations

Footnotes

1 In contrast to official Erasmus statistics, only those visits that were carried out entirely in-person are counted as regular visits. In the official Erasmus statistics, visits in hybrid format are also counted as regular visits.

2 For reasons of clarity, only mobility flows with at least 25,000 internationally mobile students are shown.

3 Including students from Hong Kong and Macau.

4 Data from the Federal Statistical Office Germany since, unlike other host countries, the UNESCO data for Germany on the countries of origin of international students do not include international doctoral students.

5 Switzerland has not been a programme country under the Erasmus+ programme since 2014.

6 Data from 2017 as no data for 2018 were available.

1.1 Mobility trends and mobility flows

According to UNESCO, around 5.6 million students were enrolled outside their home country in 2018. This corresponds to an increase of around 240,000 international students, or 4% compared to the previous year. Since 2008 the number of internationally mobile students has increased by around 2.2 million, or 68%. However, only about half of this increase can be explained by the parallel rise in the number of all students worldwide during the same period, which increased by 36%. The reasons for this substantial growth can broadly be divided into push and pull factors. Push factors are identified as problems in students' countries of origin that motivate mobility. These factors include political and economic instability, often combined with insufficient capacity in the higher education system, low quality of teaching, lack of reputation of universities and research, and limited employment opportunities. Inadequate capacities at domestic universities often go hand in hand with a growing population. On the other hand, specific characteristics of the various host countries function as pull factors. Most of these factors are virtually a mirror image of the push factors: political and economic stability combined with well-developed capacities in the higher education system, high quality teaching, a worldwide reputation for higher education and research, and good employment opportunities.

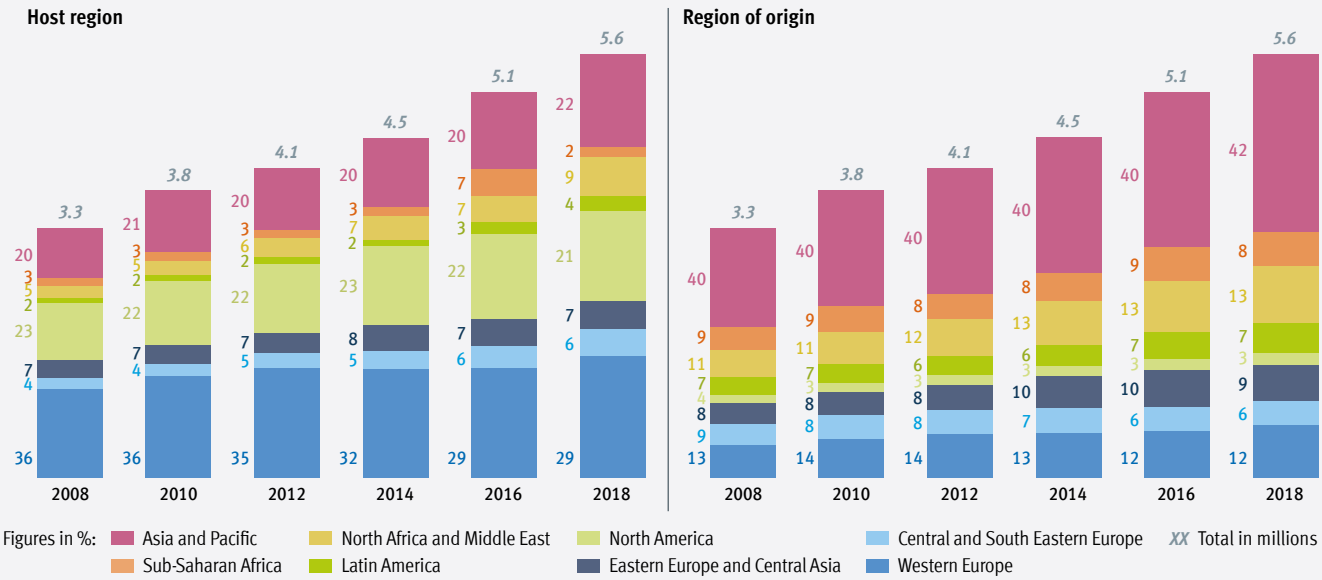
The importance of most host regions and the regions of origin of international students changed only slightly between 2008 and 2018. Western Europe continues to dominate the host regions (29%), followed by Asia and Pacific (22%) and North America (21%). However, the Western Europe region has dropped by seven percentage points since 2008. Among the regions of origin, Asia

Methodology

The basis for the collection and processing of data is the *International Standard Classification of Education* (ISCED), of 2011, which ensures the international comparability of national data. As a result, there are some deviations from national data, for example also with regard to Germany.

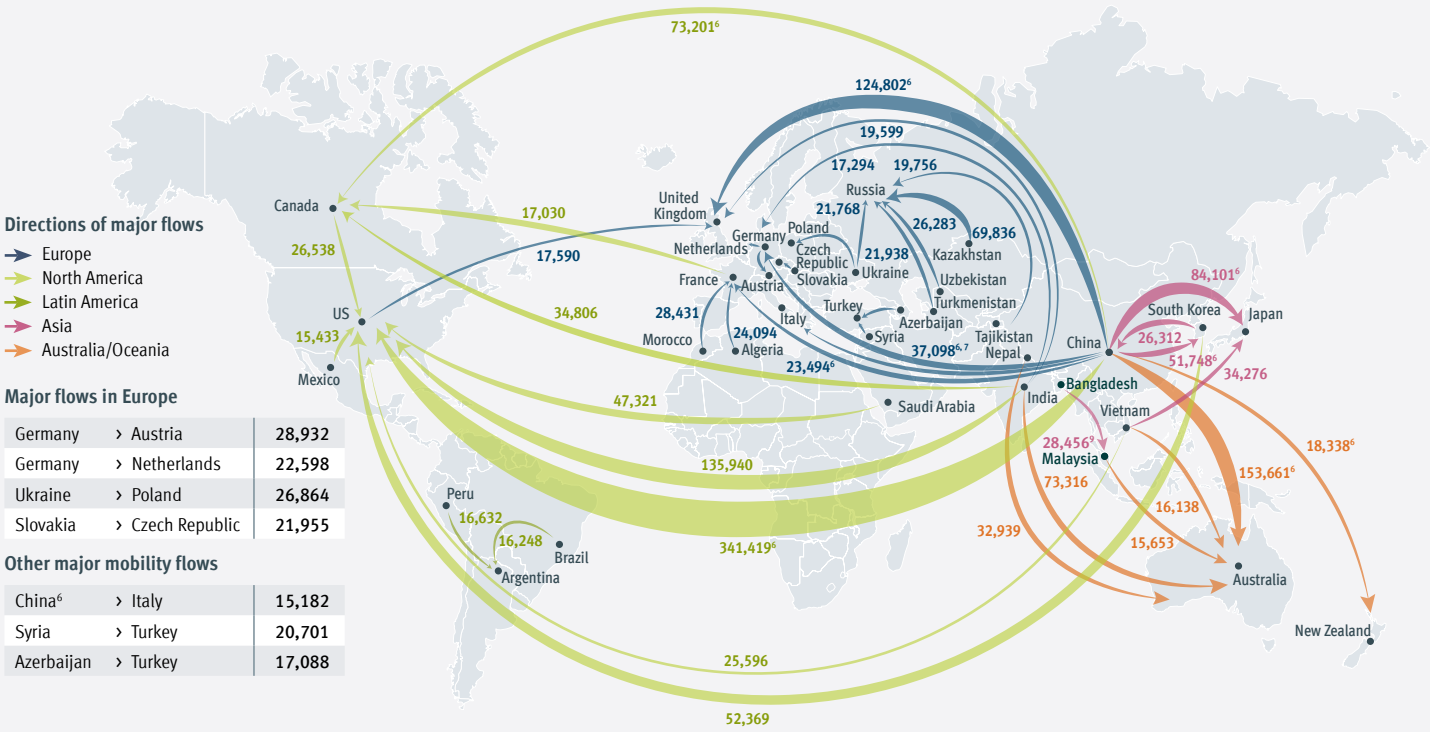
When interpreting the data presented here, it should be noted that the vast majority of student mobility recorded by UNESCO is degree mobility and only a very small proportion is temporary credit mobility. The data are therefore not comparable with national data on temporary study-related student mobility, such as the data on German students presented in Chapter C2. Moreover, the UNESCO statistics are not based on a complete survey of all mobile students worldwide but only on the best possible calculation of these statistics on the basis of the respective available data. Missing data are estimated. The availability and informative value of the data depend heavily on the development of education statistics in the respective countries. Some countries, particularly in South and Central America and Africa, have so far been unable to provide any data on international students at their universities. Even China, which is now a major host country, has not yet provided UNESCO with data on the origin of international students in China. This inevitably leads to an underestimation of the importance of certain host countries or regions of origin.

A1.1 International students, by host region and region of origin, since 2008[1, 2]



Source: UNESCO student statistics; country-specific reporting periods; DAAD calculations

A1.2 Major flows of international student mobility, in 2018[3, 4, 5]



Directions of major flows

- Europe
- North America
- Latin America
- Asia
- Australia/Oceania

Major flows in Europe

Germany	› Austria	28,932
Germany	› Netherlands	22,598
Ukraine	› Poland	26,864
Slovakia	› Czech Republic	21,955

Other major mobility flows

China[6]	› Italy	15,182
Syria	› Turkey	20,701
Azerbaijan	› Turkey	17,088

Figures for absolute numbers of students

Sources: UNESCO student statistics; Federal Statistical Office; MoE, statistical report on international students in China; country-specific reporting periods; DAAD calculations

Footnotes

1 Deviations in comparison with previous issues of *Wissenschaft weltoffen* and *Wissenschaft weltoffen kompakt* result from updates to the UNESCO database in the intervening period.

2 Data on regions of origin without international students in China as their countries of origin are not yet included in UNESCO statistics and no other data source provides corresponding time series.

3 For the sake of clarity, only mobility flows with at least 15,000 internationally mobile students are shown.

4 To capture as complete a picture of international student mobility as possible, country of origin data from the Chinese Ministry of Education (MoE) were used to supplement UNESCO data for international students in China. Data are available on the top 15 countries of origin of international students in China: Bangladesh, France, India, Indonesia, Japan, Kazakhstan, Laos, Malaysia, Mongolia, Pakistan, Russia, South Korea, Thailand, the US and Vietnam. These are not yet included in UNESCO statistics. To display data on international student mobility to China that are as comparable as possible with UNESCO data from other countries, the percentages of non-degree related visits by international students were deducted. The reduction in international students visiting China in comparison to the previous year is therefore of statistical origin.

5 Not including Singapore as a host country since the UNESCO statistics do not include data on the countries of origin of international students.

6 Including students from Hong Kong and Macau.

7 Data from the Federal Statistical Office, as the UNESCO data on the countries of origin of international students for Germany – in contrast to other host countries – do not include international doctoral students.

8 Including students from Hong Kong and Macau. Mobility between China, Hong Kong and Macau has been excluded.

9 Data from 2017, as data on 2018 were not yet available.

and Pacific has for years represented by far the largest proportion of internationally mobile students (42%), followed by North Africa and the Middle East (13%), and Western Europe (12%).

The largest flows of international student mobility are from China (by some distance the leading country of origin) to the US, Australia, the United Kingdom and Japan as key host countries. In 2018, a total of around 986,000 students from China were enrolled at universities abroad.[8] These alone represent 18% of all internationally mobile students worldwide. Their number has increased by around 7% compared to the previous year and by 87% over the last decade. Around 341,000 Chinese students were enrolled at universities in the US alone in the 2018 academic year. This number represents 6% of all global student mobility, a rise of 4% over the previous year. UNESCO lists around 154,000 Chinese students in 2018 in Australia (+11%), around 125,000 in the United Kingdom (+10%) and around 84,000 in Japan (+5%). Other significant student mobility flows are from India to the US (136,000 or –5% compared to the previous year), from China to Canada (73,000, +41%), from Kazakhstan to Russia (73,000, +7%) and from South Korea to China (70,000, +7%).

Within Europe, the main student flows are from Germany to Austria (29,000, +2%) and the Netherlands (23,000, 0%), from Ukraine to Poland (27,000, –23%) and from Slovakia to the Czech Republic (22,000, –2%).

1.2 Key host countries

When looking at the host countries of international students, a distinction must be made between countries with the largest absolute number and countries with the largest share of international students. For example, the number of international students in the US (by far the most important host country) in 2018

> “The diversity of countries of origin is significantly higher in Germany and France than in Australia and the US.

amounted to roughly 987,000. However, considered as a proportion of all students, this amounts to only 5%. By contrast, only around 12,000 international students studied in Qatar in the same year, but the share of all students here is 34%. Other countries with high proportions of international students are Australia (27%), Singapore (26%) and Cyprus (24%). By contrast, the figure for Japan, which ranks ninth among the key host countries, is only 5%, while for Norway, which hosts a similar number of international students to Qatar, the figure is just 4%.

Taken as a share of all international students in a given country, the proportion of international students from key countries of origin varies between host countries. For the four key host countries, the US, the United Kingdom, Australia and Germany, China and India are the key countries of origin with the highest number of international students. While these two countries account for around half of all international students in the US (48%) and Australia (51%) alone, the proportions in Germany (19%) and France (12%) are much lower. This means that in Germany and France the diversity of countries

International Education Hubs: Qatar’s Education City

The high share of international students in Qatar is in part due to the fact that a large proportion of the population are immigrants who do not hold Qatari citizenship. Another reason might be state investment in the university sector since the late 1990s and the associated goal of establishing Qatar as an “education hub” in the region. Until 2001 Qatar had only one university. Now, branch campuses of six US universities and one each from France and the UK respectively have been united on a single campus known as Education City. The choice of these branch campuses emphasised the subjects of medicine, engineering, economics and IT, in line with the needs of Qatar and the region. This makes Qatar an attractive destination not only for domestic students but also for students from surrounding countries.[8]

A1.3 Host countries with the highest numbers and proportions of international students, in 2018[1]

Host country	Number of international students
US	987,314
United Kingdom	452,079
Australia	444,514
Germany[2]	282,002
Russia	262,416
France	229,623
Canada	224,548
China[3]	184,767
Japan	182,748
Turkey	125,138

Host country[4]	Proportion of international students in %
Qatar	34.2
Australia	26.5
Singapore	26.1
Cyprus	23.9
New Zealand	19.7
United Kingdom	18.3
Switzerland	17.7
Austria	17.5
Jordan	14.0
Canada	13.8

Sources: UNESCO/OECD/Federal Statistical Office student statistics; country-specific reporting periods; DAAD calculations

Footnotes

1 Total number of domestic students from OECD figures, if not included in UNESCO data.
2 Data from the Federal Statistical Office, since these contain all registered international doctoral students, a total of 26,265 persons, while the UNESCO data, with 23,900 international doctoral students in Germany, are based on underestimates from surveys conducted by the Federal Statistical Office.
3 Incl. Hong Kong and Macau. Mobility between Hong Kong and Macau has been excluded. However, as no country-specific data on incoming students are available for China, students from Hong Kong and Macau going to China are still included.
4 Only countries with at least 10,000 international students.
5 Including Hong Kong and Macau.
6 Data from the Federal Statistical Office as the UNESCO data on the countries of origin of international students for Germany – in contrast to other host countries – do not include international doctoral students.
7 See Preiss (2012).
8 See Ibnouf et al (2014).

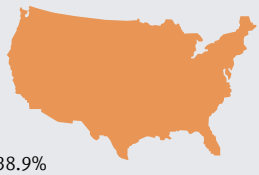
of origin is significantly greater than in Australia and the US. A comparably low level of diversity may also be observed for the United Kingdom, where Chinese and Indian students account for 32%. For the US, Australia and the United Kingdom as well, this means that the enrolment figures of international students depend heavily on just one or two countries of origin. In these three countries in particular, this dependency is further exacerbated by the fact that international students pay significantly higher tuition fees than domestic students and therefore contribute a high proportion of higher education funding. Sudden slumps in incoming mobility from these two countries of origin could soon lead to enormous problems for the entire higher education funding system in these countries. This is exemplified by the marked decline in the number of Indian students in Australia between 2007 and 2011, which dropped from over 30,000 to under 10,000 students.[7]

Apart from China, the major countries of origin for international students in France include French-speaking African countries, such as Morocco, Algeria and Tunisia, which are still closely linked to France by their colonial past. In the case of Germany, the relatively high number of students from Russia can certainly also be attributed in part to close economic and cultural ties. Accounting for 19% of all students from Russia who travel abroad, Germany is their most important host country.

Moreover, there is a marked regional emphasis in the countries of origin of international students in Russia itself, in that the five key countries of origin – Kazakhstan, Uzbekistan, Turkmenistan, Ukraine and Tajikistan – account for over two thirds of all international students. In contrast to all other major host countries, China and India, which together account for only 9% of all international students, only play a very minor role. The profile of the countries of origin for international students in Australia shows a similar pattern as the five key countries of origin are all located within the local Asia and Pacific region.

A1.4 Key countries of origin for international students in key host countries, in 2018

Host country: US



Other countries 38.9%

Country of origin	Number	in %
China[5]	341,419	34.6
India	135,940	13.8
South Korea	52,369	5.3
Saudi Arabia	47,321	4.8
Canada	26,538	2.7

Host country: Germany[6]

Other countries 69.8%

Country of origin	Number	in %
China[5]	37,098	13.2
India	17,294	6.1
Austria	11,130	3.9
Russia	10,795	3.8
Italy	8,908	3.2

Host country: United Kingdom

Other countries 57.8%

Country of origin	Number	in %
China[5]	124,802	27.6
India	19,599	4.3
US	17,590	3.9
Malaysia	14,950	3.3
Italy	13,904	3.1

Host country: Russia

Other countries 39.2%

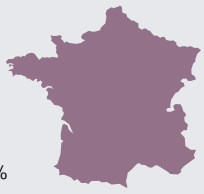
Country of origin	Number	in %
Kazakhstan	69,836	26.6
Uzbekistan	26,283	10.0
Turkmenistan	21,938	8.4
Ukraine	21,768	8.3
Tajikistan	19,756	7.5

Host country: Australia

Other countries 34.4%

Country of origin	Number	in %
China[5]	153,661	34.6
India	73,316	16.5
Nepal	32,939	7.4
Vietnam	16,138	3.6
Malaysia	15,653	3.5

Host country: France



Other countries 58.9%

Country of origin	Number	in %
Morocco	28,431	12.4
Algeria	24,094	10.5
China[5]	23,494	10.2
Tunisia	9,499	4.1
Senegal	8,898	3.9

Sources: UNESCO/Federal Statistical Office student statistics; country-specific reporting periods; DAAD calculations

1.3 Key countries of origin

The two key countries of origin of internationally mobile students are China, with around 986,000, and India, with around 387,000 international students. These are followed – after a clear margin – by Germany (131,000), South Korea (128,000) and Vietnam (114,000). This is the first time that Vietnam is one of the five key countries of origin. It should be noted that these statistics include not only UNESCO data but also, for the first time, publicly accessible data from the Chinese Ministry of Education (MoE) on the top 15 countries of origin for international students in China. These data have not been included in UNESCO statistics to date. To present figures for international student mobility to China that are most readily comparable with UNESCO data on other countries, the percentages of non-degree related visits by international students were deducted. As a result, some countries of origin, like South Korea, show significant decreases compared to the previous edition of *Wissenschaft weltoffen* and there are also shifts in the ranking of countries, although largely for statistical reasons. When looking at countries of origin, a distinction must also be made between countries with the largest absolute number and countries with the largest share of internationally mobile students. For example, although China is by far the most important country of origin in 2018, with around 986,000 internationally mobile students, they make up only 2% of all Chinese students. In India, the second key

> “47% of internationally mobile students from India are enrolled in North America, while only 28% remain in the Asia and Pacific region.

A1.5 Countries of origin with the highest numbers and proportions of internationally mobile students, in 2018[2]

Country of origin	Number of internationally mobile students
China[3]	985,575
India	387,118
Germany[4]	130,617
South Korea	128,086
Vietnam	114,402
France	105,049
US	95,267
Kazakhstan	89,631
Nepal[5]	81,917
Saudi Arabia[5]	77,406

Country of origin[6]	Proportion of internationally mobile students in %
Luxembourg[5]	62.2
Cyprus[5]	36.0
Moldavia[5]	18.2
Azerbaijan[5]	17.9
Slovakia[5]	17.9
Kuwait[5]	17.5
Nepal[5]	16.8
Bosnia and Herzegovina[5]	13.9
Kazakhstan	12.4
Albania[5]	12.1

Sources: UNESCO student statistics; MoE statistical report on international students in China; Federal Statistical Office, “Deutsche Studierende im Ausland”; country-specific reporting periods; DAAD calculations

Footnotes

1 This ratio should be understood as the proportion of German students studying abroad for a degree in relation to the total number of German students. The ratio is therefore significantly lower than that of students with temporary study-related visits abroad (see Chapter C2).

2 To capture as complete a picture of international student mobility as possible, country of origin data from the Chinese Ministry of Education (MoE) were used to supplement UNESCO data for international students in China. Data are available on the top 15 countries of origin of international students in China: Bangladesh, France, India, Indonesia, Japan, Kazakhstan, Laos, Malaysia, Mongolia, Pakistan, Russia, South Korea, Thailand, the US and Vietnam. These are not included in the UNESCO statistics. To present figures for international student mobility to China that are most readily comparable with UNESCO data on other countries, the percentages of non-degree related visits by international students were deducted. The reduction in international students visiting China in comparison to the previous year is therefore of statistical origin.

3 Incl. Hong Kong and Macau. Mobility between Hong Kong and Macau has been excluded. However, as no country-specific data on incoming students are available for China, students from Hong Kong and Macau going to China are still included.

4 UNESCO statistics were supplemented by data from the Federal Statistical Office on numbers of German students in China. These are not included in UNESCO statistics.

5 Not including the number of international students in China, as these are not included in either UNESCO statistics or the Chinese Ministry of Education (MoE) statistical report.

6 Only countries with at least 10,000 international students.

7 Data from the Federal Statistical Office as the UNESCO data on the countries of origin of international students for Germany – in contrast to other host countries – do not include international doctoral students.

8 Including Hong Kong and Macau.

9 See Barnett et al (2016), Didelon/Richard (2012), Shields (2013), Shields (2016).

10 It should be noted, however, that the probability of a high proportion of intraregional mobility increases with the size and number of countries within a region and is therefore highly dependent on the regional classification used. This becomes clear, for example, when comparing the North American region with the Asia and Pacific region.

11 Data from the Federal Statistical Office on numbers of German students in China (not including Hong Kong and Macau) as these students are not included in either UNESCO statistics or the Chinese Ministry of Education (MoE) statistical report. Data from the Federal Statistical Office supplemented by UNESCO data on German students in Hong Kong and Macau.

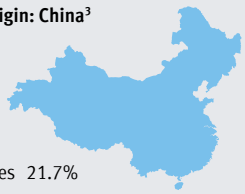
country of origin, the proportion of internationally mobile students is only 1%. By contrast, some other countries indicate markedly higher proportions of international students in relation to the total number of students. These particularly include countries with low higher education capacities or relatively underdeveloped university systems compared to global standards, such as Luxembourg (62%), Cyprus (36%), Moldavia, Azerbaijan, Slovakia and Kuwait (18% each). According to UNESCO statistics, internationally mobile students in Germany make up around 4% of all students.[1]

Looking at both the countries of origin with the highest shares and those with the strongest growth in the number of internationally mobile students recorded by UNESCO, it is striking that smaller countries and countries that do not yet have internationally renowned higher education systems are seeing particularly high proportions and growth rates. In countries such as Germany, the US or the United Kingdom, on the other hand, mobility rates and growth rates are comparatively much lower. This is partly explained by the fact that UNESCO statistics primarily record degree-related international student mobility (see info box on p. 12). This form of mobility is motivated by reasons that are fundamentally different to those for temporary study-related mobility. While degree-related international mobility is usually motivated by the endeavour to improve the student's prospects and career plans by obtaining a foreign university degree, temporary study-related mobility is more dominated by the desire to broaden one's horizon, improve foreign language skills and further one's career, for example.

Historical, linguistic, economic and political factors lead to clear preferences among the preferred host countries of the internationally mobile students.[9] In some cases, this can lead to a strongly regional orientation of student mobility.[10] For example, 71% of German students remain within the Western European region, while 59% of Vietnamese students remain within the Asia and Pacific region. By contrast, a significantly lower proportion of intraregional mobility is evident among Chinese students, only 33% of whom choose a country in the Asia and Pacific region, while 44% choose to study in North America. This observation also applies to Indian students to an even more pronounced extent, where 47% of the students who are internationally mobile are currently enrolled in North America, while the share of students in the Asia and Pacific region is only 28%.

A1.6 Preferred host countries for internationally mobile students from key countries of origin, in 2018[2, 7]

Country of origin: China[3]



Other countries 21.7%

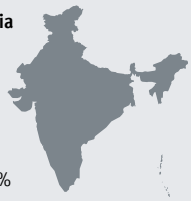
Host country	Number	in %
US	341,419	34.4
Australia	153,661	15.5
United Kingdom	124,802	12.6
Japan	84,101	8.5
Canada	73,201	7.4

Country of origin: Vietnam

Other countries 23.0%

Host country	Number	in %
Japan	34,276	29.4
US	25,596	22.0
Australia	16,138	13.9
South Korea	7,752	6.7
China[8]	5,923	5.1

Country of origin: India



Other countries 32.2%

Host country	Number	in %
US	135,940	35.0
Australia	73,316	18.9
Canada	34,806	8.9
United Kingdom	19,599	5.0
Germany[7]	17,294	4.4

Country of origin: South Korea

Other countries 16.6%

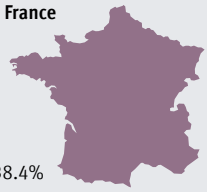
Host country	Number	in %
US	52,369	40.7
China[8]	27,606	21.4
Japan	13,227	10.3
Australia	8,350	6.5
Germany[7]	5,843	4.5

Country of origin: Germany

Other countries 35.9%

Host country	Number	in %
Austria	28,932	22.2
Netherlands	22,598	17.3
United Kingdom	13,067	10.0
Switzerland	10,996	8.4
China[11]	8,136	6.2

Country of origin: France



Other countries 38.4%

Host country	Number	in %
Canada	17,030	16.4
Belgium	14,885	14.4
United Kingdom	13,265	12.8
Switzerland	10,447	10.1
Spain	8,220	7.9

Sources: UNESCO student statistics; MoE statistical report on international students in China; Federal Statistical Office, "Deutsche Studierende im Ausland "; country-specific reporting periods; DAAD calculations

1.4 Student mobility in Europe

One of the central objectives of European higher education policy is to increase student mobility within the European Higher Education Area (EHEA). A specific mobility goal was set for all EU countries in 2011 in the "Council conclusions on a benchmark for learning mobility". This goal was also adopted for all EHEA countries in the "Bucharest Communiqué" one year later under the Bologna Process. This goal stipulates that by 2020 at least 20% of all university graduates in any year in the EU or EHEA countries should have acquired a degree abroad or gained temporary study-related mobility experience. Temporary study-related mobility is defined as recognised study or placements of at least three months or worth at least 15 ECTS points. Data on this have so far only been published for EU countries. According to the latest statistics, 13.5% of higher education graduates in the EU were internationally mobile in 2018 as part of their studies, as defined by the criteria of the EU mobility benchmark. At 9.1% temporary study-related mobility (credit mobility) accounted for the largest proportion of this mobility. The remaining 4.3% was attributable to degree-related international mobility (degree mobility). Thus, two years before 2020, the EU was still relatively far from reaching its target.[1]

A comparison between the individual EU countries shows clear differences in student mobility. Luxembourg students are by far the most mobile, with an overall mobility rate of around 87%. 74% of Luxembourg students undertake degree-related mobility and spend their entire period of study abroad. Cyprus (37%) and the Netherlands (25%) are a clear distance behind but their mobility rates are also well above average. There are large differences between these two countries – as in comparison with all other EU countries – in terms of the type of mobility that students prefer. While students from Cyprus almost exclusively study abroad with regard to gaining a degree (35%), temporary study-related visits abroad dominate in the Netherlands (23%). All other EU countries are still below the target of 20%, including Germany, though at 19.9%, it only just misses the target.

The key student mobility flows within the EHEA in 2018, at over 20,000 students each, are from Kazakhstan to Russia, from Ukraine to Poland, from Germany to Austria and the Netherlands, and from Slovakia to the Czech Republic. The key host country for students from the EHEA is the United Kingdom, which hosts around 156,000 international students from other EHEA countries, followed by Russia (128,000), Germany (119,000), Austria (65,000) and the Netherlands (58,000). The key country of origin of students from the EHEA is Germany, which has around 109,000 international students in other EHEA countries, followed by Kazakhstan (79,000), Ukraine (74,000), France (69,000) and Italy (66,000).

A1.7 Mobility rates of students within the EU from major countries of origin, in 2018[2]

Country of origin	Proportion of internationally mobile students in %		
Luxembourg	74.1	12.7	86.7
Cyprus	35.2	2.2	37.4
Netherlands	2.8	22.5	25.3
Germany	5.3	14.5	19.9
Finland	4.1	15.1	19.2
France	3.5	14.6	18.1
Lithuania	9.5	7.0	16.4
Slovakia[4]	15.7		15.7
Estonia	10.1	5.5	15.6
Sweden	4.5	10.5	15.0
Austria	5.8	9.1	14.8
Malta	9.4	5.3	14.6
Czech Republic	5.0	9.0	14.0
Italy	4.8	8.9	13.7
Latvia	8.1	5.2	13.3
Greece[4]	12.2		12.2
Portugal	4.2	7.0	11.2
Denmark	1.8	9.3	11.1
Belgium	3.9	6.7	10.6
Bulgaria	8.8	1.4	10.2
Spain	2.2	7.7	9.9
Hungary	4.7	3.7	8.4
Romania	6.0	1.7	7.7
Croatia	3.5	3.6	7.0
Ireland[4]	5.8		5.8
Slovenia[4]	4.0		4.0
Poland	1.2	1.2	2.4
EU total	4.3	9.1	13.5

Proportion in %
XX Total mobility Degree-related mobility Temporary study-related mobility

Source: European Commission, Education and Training Monitor 2020

Footnotes

1 It should be noted here that in some countries (including Germany), mobility data are still based on estimates or projections since their national higher education statistics do not yet provide any corresponding official data. Moreover, no data on temporary study-related mobility are yet available for four countries (Greece, Ireland, Slovakia and Slovenia). However, since all EU countries are encouraged to expand their higher education statistical coverage for this area, the data situation is expected to continue to improve in the coming years.

2 Due to rounding, the added single values partly deviate from the total value.

3 For reasons of clarity, only mobility flows with at least 5,000 students are shown.

4 Data on temporary study-related mobility are not yet available for these countries.

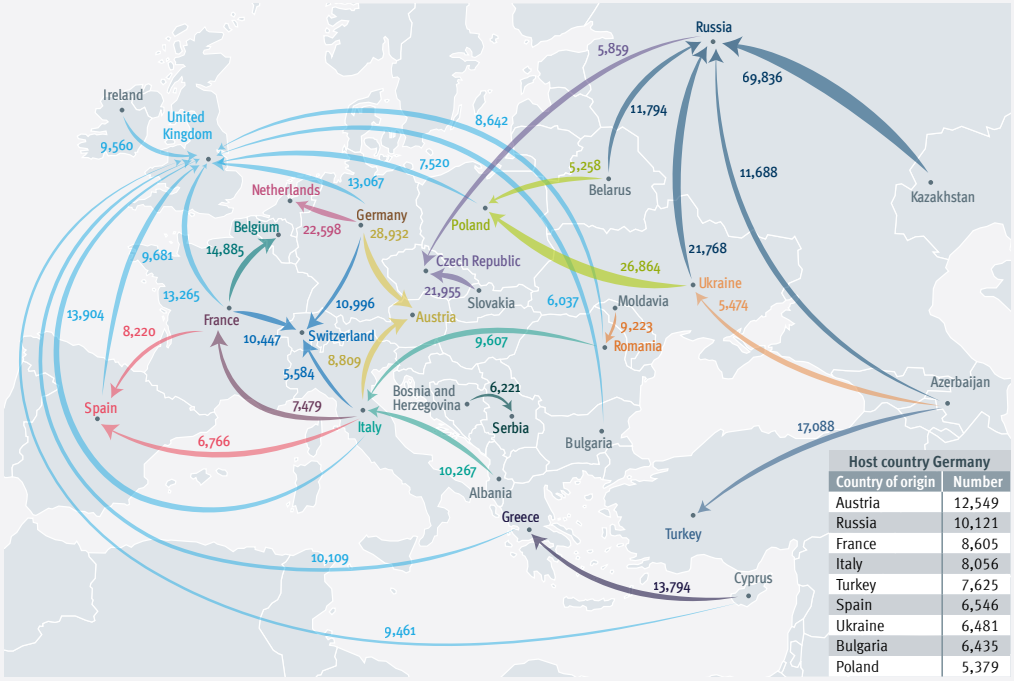
5 To capture as complete a picture of international student mobility as possible, country of origin data from the Chinese Ministry of Education (MoE) were used to supplement UNESCO data for international students in China. Data are available on the top 15 countries of origin of international students in China: Bangladesh, France, India, Indonesia, Japan, Kazakhstan, Laos, Malaysia, Mongolia, Pakistan, Russia, South Korea, Thailand, the US and Vietnam. These are not included in UNESCO statistics. To present figures for international student mobility to China that are most readily comparable with UNESCO data on other countries, the percentages of non-degree related visits by international students were deducted. The reduction in international students visiting China in comparison to the previous year is therefore of statistical origin.

6 UNESCO statistics were supplemented by data from the Federal Statistical Office on numbers of German students in China. These are not included in UNESCO statistics.

Viewed in the context of key EHEA host countries, it is clear that the significance of the EHEA as a region of origin varies greatly in these countries. The countries with the highest proportion of students from EHEA countries are Austria, the Czech Republic (87% each), Denmark (82%) and Poland (80%). The lowest proportions of international students from EHEA countries are found in Kazakhstan (12%), Portugal, France (18% each), Belarus (21%) and Ireland (25%).

Similarly, there are also substantial differences within the EHEA with regard to countries of origin. The highest proportions of internationally mobile students in other EHEA countries are 99% for Moldova and 98% each for Cyprus, Slovakia, Belarus and Azerbaijan. Conversely, there are no countries where the share of host countries outside the EHEA exceeds 50%. The highest proportions in this regard are found in the United Kingdom (49%), Russia, France (33% each), Sweden and Turkey (30% each). While the majority of mobile students from many EHEA countries appear to be studying in other EHEA countries, this does not mean that they represent the majority of international students in all of these countries. In the two key host countries of the EHEA in particular, the United Kingdom and Germany, students from non-EHEA countries dominate.

A1.8 Major flows of student mobility within the European Higher Education Area, in 2018[3]



Host country Germany

Country of origin	Number
Austria	12,549
Russia	10,121
France	8,605
Italy	8,056
Turkey	7,625
Spain	6,546
Ukraine	6,481
Bulgaria	6,435
Poland	5,379

Figures for absolute numbers of students

Sources: UNESCO/OECD student statistics

A1.9 Major host countries in the European Higher Education Area, by proportion of students travelling to study in EHEA and non-EHEA countries, in 2018

	Incoming students			
	from EHEA countries		from non-EHEA countries	
Host country	Number	in %	in %	Number
Czech Republic	39,149	87	13	5,618
Austria	65,253	87	13	10,006
Denmark	27,344	82	18	5,944
Poland	43,245	80	20	11,109
Greece	19,359	74	26	6,966
Switzerland	39,641	73	27	14,638
Romania	19,718	68	32	9,394
Hungary	18,513	57	43	13,819
Netherlands	58,404	56	44	45,611
Russia	128,187	49	51	134,229
Italy	49,203	46	54	57,408
Belgium	23,723	44	56	30,173
Sweden	12,390	40	60	18,522
Spain	27,895	39	61	43,017
Germany	119,045	38	62	192,693
United Kingdom	156,470	35	65	295,609
Turkey	37,208	30	70	87,930
Ukraine	13,530	27	73	36,102
France	41,644	18	82	187,979
Portugal	4,975	18	82	23,147

Source: UNESCO student statistics; DAAD calculations

A1.10 Major countries of origin in the European Higher Education Area, by proportion of students travelling to study in EHEA and non-EHEA countries, in 2018[5]

	Students travelling to study abroad			
	to EHEA countries		to non-EHEA countries	
Country of origin	Number	in %	in %	Number
Moldavia	20,545	99	1	300
Cyprus	26,004	98	2	466
Azerbaijan	43,056	98	2	982
Belarus	22,100	98	2	512
Slovakia	30,649	98	2	779
Romania	36,016	96	4	1,395
Bulgaria	23,940	96	4	1,078
Ukraine	73,979	95	5	3,817
Greece	36,211	93	7	2,812
Austria	19,790	92	8	1,641
Poland	23,746	90	10	2,518
Albania	16,695	89	11	1,997
Italy	65,798	87	13	9,932
Kazakhstan	79,462	86	14	13,152
Germany[6]	108,513	84	16	21,348
Spain	32,306	77	23	9,634
Turkey	32,827	70	30	13,880
Russia	44,094	67	33	21,743
France	69,205	67	33	34,397
United Kingdom	17,832	51	49	16,892

Sources: UNESCO student statistics; MoE, statistical report on international students in China; DAAD calculations

SPOTLIGHT

On the bibliometric measurement of international researcher mobility

A guest contribution by Dr Dimity Stephen and Dr Stephan Stahlschmidt

Dr Dimity Stephen is a post-doctoral researcher in the Research System and Science Dynamics Department at the German Centre for Higher Education Research and Science Studies (DZHW). Dr Stephen conducted the analysis for the broader study through which these results were produced and wrote the English version of this article.

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As in former issues of *Wissenschaft Weltoffen,* the international researcher mobility flows presented in this section are based on data from Elsevier's Scopus database. This database contains bibliometric data for millions of publications published in over 22,000 academic journals. Elsevier algorithmically disambiguates authors in Scopus by clustering all publications into profiles based on author names, co-authors, affiliations, publication dates, journal title, and subject area, and assigns each profile a unique Author ID. Researcher mobility can be examined based on changes in the country affiliations in the set of publications associated with an Author ID over time.

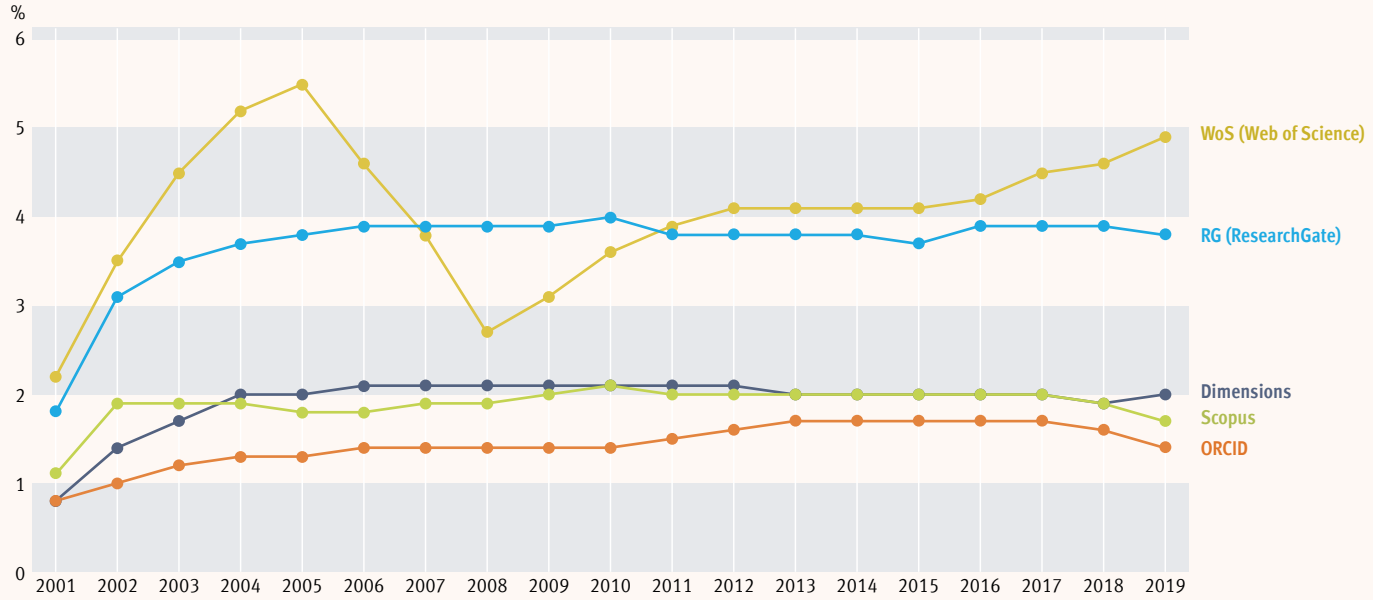
To examine mobility using Scopus data in this report, all affiliations of each Author ID between 2000 and 2019 were extracted from the German Competence Centre for Bibliometrics' in-house version of the Scopus database. In some instances authors were affiliated with two or more countries in one year. In such cases, these years were removed as retaining a previous affiliation might suggest an author's change in affiliations was not accompanied by physical relocation. As authors typically do not publish every year, missing affiliations were filled based on the last available affiliation. Having established a complete time series, each author's affiliation was compared to the previous year to identify instances of mobility and the sending and receiving countries.[1] Annual counts of these mobility events between countries were then aggregated to the reference periods.

For indicators pertaining to incoming and outgoing mobility in comparison to non-mobile authors, all authors who published in the reference year were identified, and their affiliation in the reference year was compared to their affiliation in their most recent previous publication, whenever that was between 2000 and the last year prior to the reference year. Authors who published for the first time in the reference year were excluded as they could not reliably be identified as either mobile or stable. Non-mobile authors were defined as authors whose affiliation was the same on their reference year and pre-reference year publications. Incoming authors to the reference country were defined as those affiliated with the reference country in the reference year, but affiliated with a different country in their pre-reference year publication. Outgoing authors were defined as those whose pre-reference year affiliation was the reference country, but whose affiliation in the reference year was not the reference country.

There are some limitations and considerations to using bibliometrics data to analyse mobility, however. For instance, mobility based on publications may appear later than it actually occurred due to delays in publishing, and some instances of mobility, such as research stays abroad that did not result in a publication, will not be captured through bibliometric data. Further, in interpreting mobility flows it should be considered that mobility between countries represents both researchers leaving or returning to their home countries and also mobility of guest researchers in a host country. For instance, a researcher may already have moved to a host country at the time of their first publication and any subsequent outgoing mobility may reflect a return to their home country or onward movement to a third country. The potential influence of these supposedly random inaccuracies of a bibliometric approach to measure scientific mobility seems limited when examining data at the high aggregation level of countries.[2]

> "Some instances of mobility, such as research stays abroad that did not result in a publication, will not be captured through bibliometric data.

AS1 Proportions of all academic authors identified as mobile in each data source, 2001–2019



Sources: Respective databases and networks; DZHW calculations

However, it should also be considered that the journals indexed in Scopus do not represent all publications globally but have a particular focus on English-language journals and specific scientific disciplines. As such, some countries with a strong focus on English-language publications may be over-represented in Scopus-indexed publications, which can influence the level of mobility these countries represent. Researchers in disciplines that do not use journal articles as the primary means of communication are also under-represented. As authors must have two publications in Scopus-indexed journals for mobility to be detected, mobility in early career researchers or other researchers who publish infrequently may be under-represented in these publication-based data. Finally, while Elsevier's approach for disambiguating authors has generally been found to be accurate,[3] a small percentage of profiles may contain incorrect publications or be missing publications, which can influence the detection or direction of mobility.

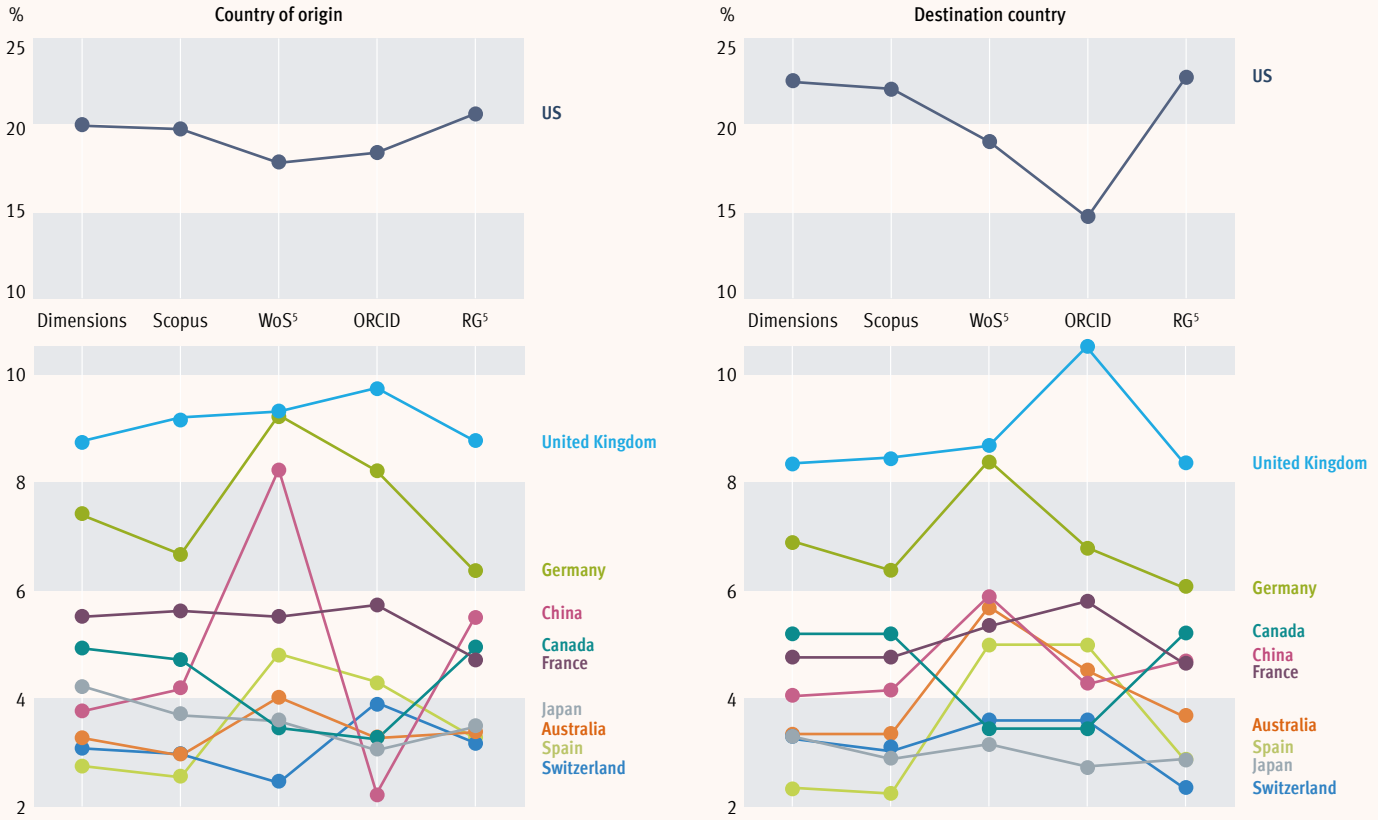
Hence, different data sources hold particular structural characteristics that reflect their approach to coverage, author disambiguation, and other features, which can influence the picture of international mobility derived from their data. For example, Fig. AS1 shows the percentage of all authors in Scopus and four other data sources who were identified as mobile in 2001 to 2019, and Fig. AS2 shows the ranking of countries based on the average percentage of total outgoing or incoming mobility they accounted for during 2000 to 2019. This analysis used essentially the same process as was previously described for Scopus data for each source (see above or p. 24) and allows the effect of the sources' particular characteristics on mobility to be observed.

> "Different data sources hold particular structural characteristics, which can influence the picture of international mobility derived from their data.

In terms of source-specific characteristics, Dimensions applies a similar method to Scopus to automatically disambiguate authors and indexes publications with similar attributes. Conversely,

On the bibliometric measurement of international researcher mobility

AS2 Average proportions of global mobility of academic authors for key countries of origin and destination countries, according to various data sources, 2001–2019[5]



Country of origin	Dimensions	Scopus	WoS[6]	ORCID	RG[6]
	Proportion in %, by data source				
US	20.0	19.8	17.8	18.4	20.7
United Kingdom	8.8	9.2	9.3	9.7	8.8
Germany	7.4	6.7	9.2	8.2	6.4
France	5.5	5.6	5.5	5.7	4.8
Canada	4.9	4.7	3.5	3.3	4.9
Japan	4.2	3.7	3.6	3.1	3.5
China	3.8	4.2	8.2	2.3	5.5
Australia	3.3	3.0	4.0	3.3	3.4
Switzerland	3.1	3.0	2.5	3.9	3.2
Spain	2.8	2.6	4.8	4.3	3.3

Destination country	Dimensions	Scopus	WoS[6]	ORCID	RG[6]
	Proportion in %, by data source				
US	22.5	22.1	19.0	14.6	22.7
United Kingdom	8.4	8.5	8.7	10.4	8.4
Germany	6.9	6.4	8.3	6.8	6.1
France	4.8	4.8	5.3	5.7	4.7
Canada	5.1	5.1	3.5	3.5	5.1
Japan	3.2	2.9	3.1	2.8	2.9
China	4.1	4.2	5.8	4.3	4.7
Australia	3.4	3.4	5.6	4.5	3.7
Switzerland	3.2	3.0	3.5	3.5	2.4
Spain	2.4	2.3	4.9	4.9	2.9

Sources: Respective databases and networks; DZHW calculations

Web of Science (WoS) applies stricter criteria for indexing high impact journals[4], and their author identifier only captures authors who have registered themselves for a Researcher ID. As such, WoS induced scientific mobility is derived from a sample of researchers predominantly based in Europe, who published repeatedly in high impact journals. ORCID and ResearchGate's users also self-registered a profile, however lower entry barriers apply. While ResearchGate relies on institutional e-mail addresses (or publications) to define its users group, ORCID registration is unrestricted and encouraged, respectively required by some journal publishers, institutions or funders. The data here for ResearchGate are drawn from affiliations in the publications users assigned to their profile, while ORCID data are based on employments recorded by users.

In these figures, the effect of the characteristics of each data source on the overall mobility detected, and the rankings and percentage of mobility for which a country accounted become evident. Broadly it can be observed in Fig. AS1 that percentages of mobile authors in the user-verified profiles of WoS and ResearchGate doubled compared to automated approaches of Scopus and Dimensions. Further, Scopus, Dimensions and ResearchGate present a similar profile of country rankings and mobility percentages, while WoS and ORCID feature higher visibility of European countries and less visibility of North America. In contrast, ORCID and WoS disagree on the role of China, with WoS assigning a relatively high relevance to China in international mobility, while ORCID presents a low relevance. Especially the until recently pronounced use of WoS-indexed journals in the Chinese research evaluation procedures might have motivated Chinese authors to attentively curate their WoS profile. Conversely, uptake of ORCID profiles seems to lag in Asia (and North America) but is strong in Africa and South America, increasing the visibility of scientific activities in the Global South.

“ Scopus, Dimensions and ResearchGate present a similar profile of country rankings and mobility percentages, while WoS and ORCID feature higher visibility of European countries and less visibility of North America.

Footnotes

1 Hereinafter we deliberately refrain from using “host country” as a term as a bibliometric analysis of mobility of academics and researchers does not allow us to determine whether a given country really is the host country of the academic or researcher concerned or their home country, to which they are returning after a period abroad.

2 See Moed/Halevi (2014).

3 See e.g. Aman (2018), Campbell/Struck (2019), Kawashima/Tomizawa (2015).

4 A publication's impact here refers to the visibility of a publication's content and its subsequent use by the scientific community. To assess this, bibliometric analysis gathers and evaluates citations of a given publication in scientific works by other academics and researchers.

5 Only countries that account for at least 3.0% of incoming and/or 3.5% of outgoing mobility of academic authors according to at least one of the data sources under review.

6 RG = ResearchGate, WoS= Web of Science.

2.1 Mobility trends and mobility flows

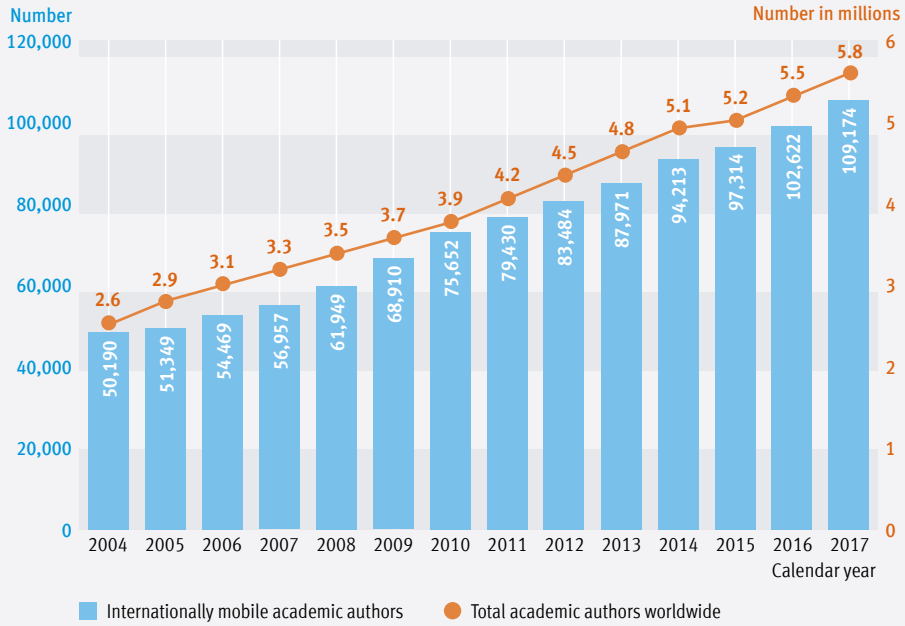
A bibliometric analysis based on Scopus data that was carried out in preparation for the *Wissenschaft weltoffen* report identified a number of around 109,000 internationally mobile academic authors for 2017 (see info box for methodology). This corresponds to an increase of around 6% over the previous year (roughly 103,000). It also shows that the number of internationally mobile academics and researchers calculated by this method has almost doubled over the past ten years (+92%). However, as a proportion of all academics and researchers, the number of internationally mobile academics and researchers has remained effectively unchanged since the first survey in 2004 at 1.8% or 1.9%.[1] This means that the increase in internationally mobile academics and researchers shown here is primarily a consequence of the continuous rise since 2004 in the number of academics and researchers – some of whom publish in academic journals – and not primarily due to an increased tendency to mobility among these academics.

Without exception, the US is involved in all 13 key streams of international academic mobility (i.e. pairs of countries with more than 2,000 mobile academics in the period from 2017 to 2019) as a destination country or country of origin.[2] The highest rates of mobile academics and researchers can be observed in both directions between the US and Canada, China and the United Kingdom. These six mobility flows alone account for around 11% of all internationally mobile academics and researchers recorded here in the period

Methodology

The bibliometric analyses on academic mobility presented here were based on data in the Scopus international database of publications and citations (by Elsevier). This database records the respective country in which the author's institution is located for every publication. In this way, such databases can also be used to analyse the mobility of international academics and researchers as comparing the country of location for different contributions submitted by an author makes it possible to draw inferences about their history of mobility. However, at least two publications during the period under review are required to determine mobility. Early career academics and researchers who produced no or only one publication in the period under review are therefore excluded from this analysis, as are researchers whose publications are not recorded in Scopus (e.g. monographs and anthologies). If an academic or researcher becomes mobile but does not publish in a given country of location, this mobility will also not be captured by this bibliometric analysis. It should therefore be noted when interpreting these data that they only capture one specific section of international academic mobility (see also pp. 20 ff. and p. 119). Nevertheless, this method is currently the best and most comprehensive way of evaluating international academic mobility and enables continuous monitoring.

A2.1 Number of internationally mobile academic authors and total academic authors worldwide, since 2004[1]



Source: Scopus database (Elsevier); German Centre for Higher Education Research and Science Studies (DZHW) calculations

Footnotes

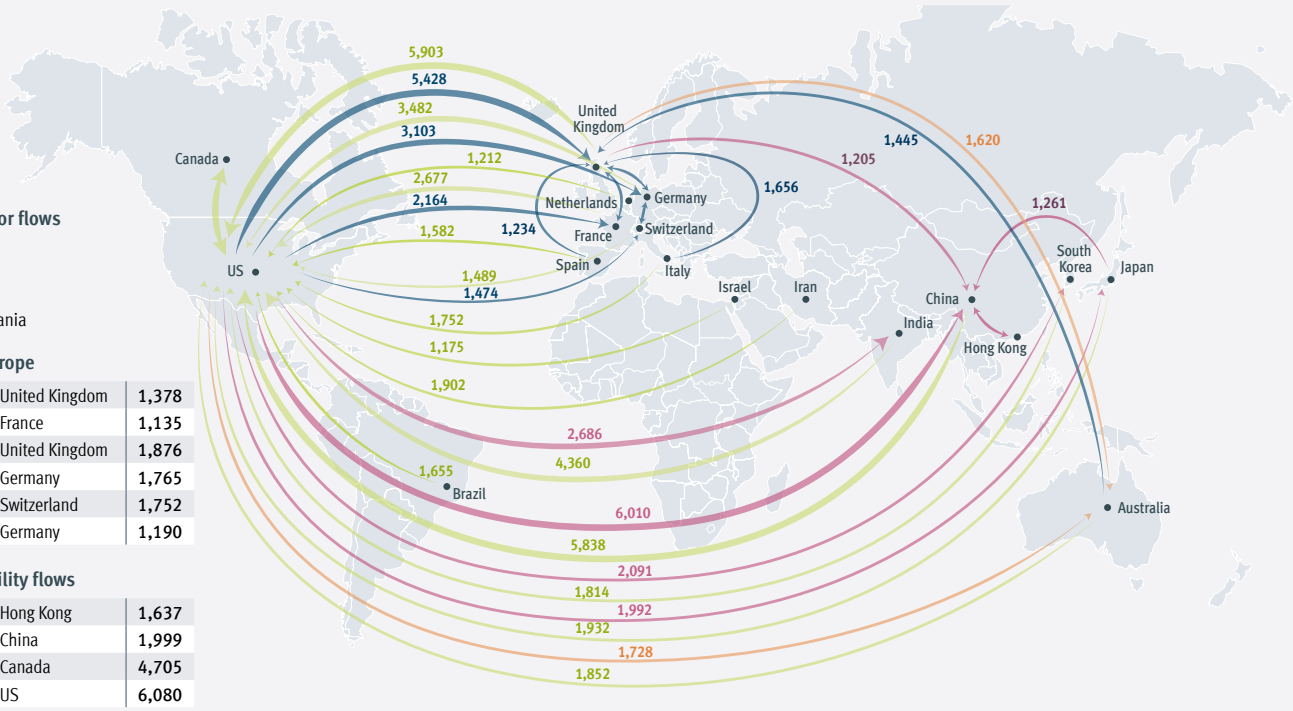
1 The Scopus database was established in 2004. As such, comparable time series data are only available from 2004 onwards. The absolute number of internationally mobile academic authors for 2018 and 2019 in particular may change significantly in the period following the publication of this report. Consequently, this table only presents time series up to 2017 to avoid misinterpretations or misunderstandings regarding trends over time.

2 A conscious decision has been made not to use the term "host country" in the following section as the bibliometric measurement of academic mobility does not allow an unambiguous determination of whether a given country is actually the host country for the academics and researchers concerned or whether those academics and researchers are returning to their country of origin after a period abroad.

3 Data on key mobility flows from 2014 to 2016 can be found in bonus table A2B1.

4 For reasons of clarity, only the 40 most significant global mobility flows are presented here.

A2.2 Key mobility flows of international academic authors from 2017 to 2019[4]



Directions of major flows

- Europe
- North America
- Asia
- Australia/Oceania

Major flows in Europe

France	› United Kingdom	1,378
United Kingdom	› France	1,135
Germany	› United Kingdom	1,876
United Kingdom	› Germany	1,765
Germany	› Switzerland	1,752
Switzerland	› Germany	1,190

Other major mobility flows

China	› Hong Kong	1,637
Hong Kong	› China	1,999
US	› Canada	4,705
Canada	› US	6,080

Figures in absolute numbers of academic authors

Source: Scopus database (Elsevier); DZHW calculations

from 2017 to 2019. The greatest increases over the period from 2014 to 2016[3] are in the flows from Brazil (+32%) and India (+26%) to the US, from Italy (+19%) and Australia (+16%) to the United Kingdom, and from Hong Kong to mainland China (+17%). However, there are also particularly marked decreases in flows from the US to South Korea (–21%), Australia (–12%) and Japan (–11%), from the United Kingdom to Australia (–13%), and from Japan to the US (–12%).

The flows of international academic mobility shown here result in different net mobilities in the respective countries of origin and destination countries. This shows that Canada, Germany and the United Kingdom all demonstrate almost perfectly balanced net mobility: in other words, the figures for incoming and outgoing academics and researchers are effectively identical in the period from 2017 to 2019 here under review. In other major destination countries, however, trends can be seen in one direction or the other. While in the cases of the US, China, Australia and Switzerland, incoming mobility slightly predominates, for France, Spain, Italy and India, there is a certain prevalence of outgoing mobility. Such inequalities are even more pronounced in countries like Vietnam, Saudi Arabia, Malaysia and Iran.

A2.3 Net mobility of internationally mobile academic authors in selected countries of origin and destination countries from 2017 to 2019

	Internationally mobile academic authors				
	Incoming			Outgoing	
Country	Number	in %			Number
Vietnam	1,480	71		29	618
Saudi Arabia	4,147	63		37	2,435
Switzerland	9,293	57		43	6,932
China	19,854	56		44	15,798
US	62,672	53		47	54,558
Australia	10,519	53		47	9,222
Canada	13,902	50		50	13,786
Germany	18,651	50		50	18,551
United Kingdom	26,216	50		50	26,708
Netherlands	6,806	49		51	7,047
South Korea	4,864	48		52	5,222
Russia	2,780	48		52	3,038
Japan	6,652	46		54	7,888
France	13,428	46		54	15,940
Brazil	4,027	41		59	5,700
Spain	6,964	41		59	10,004
Italy	6,467	38		62	10,545
India	7,346	37		63	12,420
Malaysia	2,272	34		66	4,399
Iran	2,030	27		73	5,559

Source: Scopus database (Elsevier); DZHW calculations

2.2 Important destination countries and their country of origin profiles

Similar to international student mobility, international researcher mobility also results in different preferences with regard to the destination countries. It is striking that most of the ten key destination countries worldwide are European and Anglo-American countries. China and India represent the only exceptions.

For internationally mobile academic authors, the US is by far the most popular destination country as demonstrated by the fact that, between 2017 and 2019, the bibliometric analysis showed that the US accounted for 19% of all incoming mobility. The United Kingdom (8%), China and Germany (6% each) follow at a considerable distance behind.[1] Compared to 2014 to 2016, the percentages for almost all major destination countries have fallen slightly.[2] The largest decreases were recorded for the US (–0.7 percentage points), Germany and Australia (–0.4 percentage points each). By contrast, China recorded a substantial increase of 0.9 percentage points, which now puts it in third place of the key destination countries, ahead of Germany.

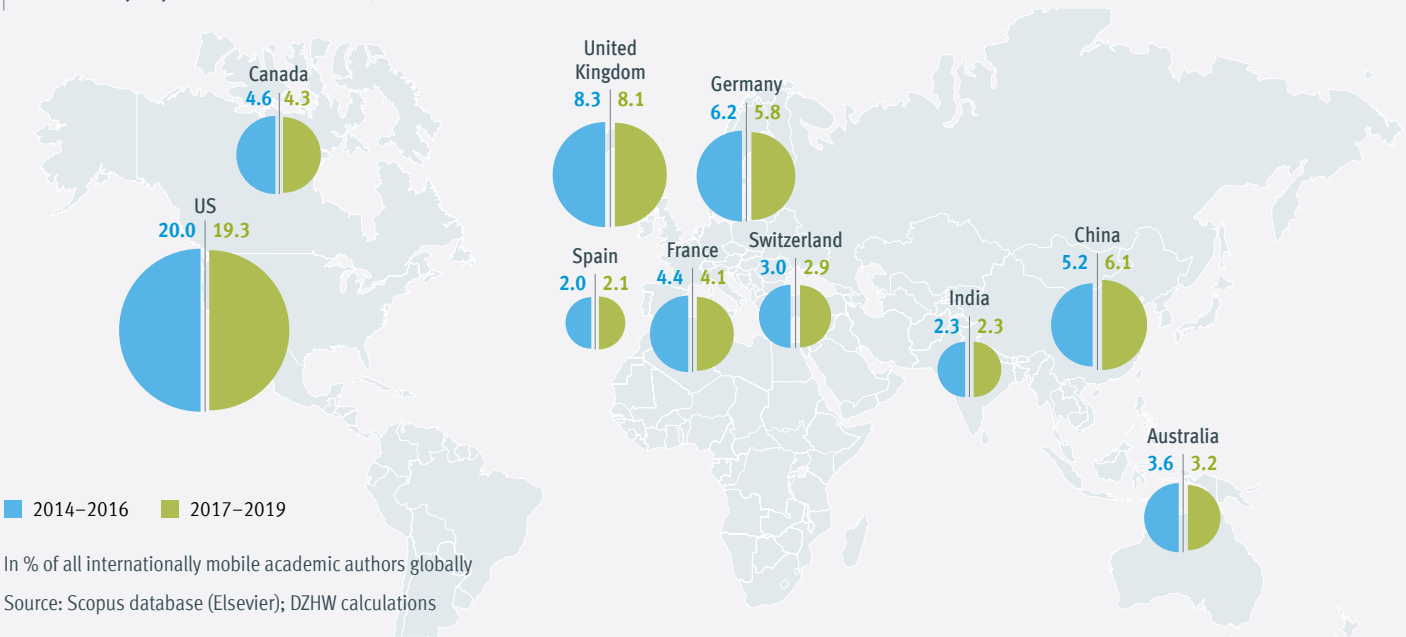
> “China has recorded the largest increase in incoming academics and researchers and is now the third key destination country, ahead of Germany.

If we look at the proportion of inbound researchers (including returnees) as a percentage of all researchers in the destination countries and regions in 2019, it is highest in Hong Kong at around 10%. It is followed by Vietnam and Switzerland (9% each), Ireland and Iraq (8% each), Singapore (7%), New Zealand and Austria (6% each). With a share of around 4%, Germany ranks 22nd, behind the United Kingdom and Australia (5% each), but ahead of the US (3%), Japan and China (1% each).

As the leading destination country, the US presents a highly diverse profile in terms of the distribution of the countries of origin of international academics and researchers working there. The three key countries of origin (i.e. Canada, the United Kingdom and China) account for a total of only 28% of incoming researchers. This proportion is significantly higher in destination countries like Canada (48%) and China (47%). In both cases, this is principally due to the notably high proportion (over 30%) of academics and researchers coming from the US. In terms of countries of origin, some regional anomalies emerge. For example, Switzerland and Austria are third and fifth respectively as sources of incoming academics and researchers for Germany. Furthermore, Italy is the third key country of origin for academics and researchers moving to France, and Japan the second key country of origin for academics and researchers moving to China. An examination of the key countries of origin and destination countries for mobile academics and researchers from or in China (see also p. 29) reveals that there is a highly intense exchange of academics and researchers between Hong Kong and mainland China.

A comparison of the periods from 2014 to 2016 and 2017 to 2019 shows a decreasing trend in the share of the top ten countries of origin in the destination countries considered here.[2] Conversely, the proportion for other countries of origin has risen quite substantially, indicating increased diversification in the countries of origin of international academics and researchers within the destination

A2.4 Internationally mobile academic authors as a proportion of all internationally mobile academic authors globally, by key destination countries, from 2014 to 2016 and 2017 to 2019



In % of all internationally mobile academic authors globally

Source: Scopus database (Elsevier); DZHW calculations

A2.5 Key countries of origin of internationally mobile academic authors in the six key destination countries, from 2017 to 2019[3]

Destination country: US

Origin: Top 10	Proportion in %
Canada	9.7
United Kingdom	9.4
China	9.3
India	7.0
Germany	5.6
France	4.3
Japan	3.1
Iran	3.0
Australia	3.0
South Korea	2.9
Other	42.8

Destination country: United Kingdom

Origin: Top 10	Proportion in %
US	20.7
Germany	7.2
Italy	6.3
Australia	5.5
France	5.3
Spain	4.7
Canada	4.1
Netherlands	3.3
China	3.0
Ireland	3.0
Other	36.9

Destination country: Germany

Origin: Top 10	Proportion in %
US	16.6
United Kingdom	9.5
Switzerland	6.4
France	5.7
Austria	4.8
Netherlands	4.7
Italy	4.7
China	4.1
Spain	3.9
India	2.9
Other	36.8

Destination country: China

Origin: Top 10	Proportion in %
US	30.3
Hong Kong	10.1
Japan	6.4
United Kingdom	6.1
Taiwan	4.8
Singapore	4.5
Germany	4.1
Australia	3.7
Canada	3.4
Pakistan	2.9
Other	23.9

Destination country: Canada

Origin: Top 10	Proportion in %
US	33.8
United Kingdom	7.6
Iran	6.9
France	6.6
China	4.3
India	3.4
Germany	3.2
Australia	2.9
Brazil	2.3
Switzerland	1.5
Other	27.5

Destination country: France

Origin: Top 10	Proportion in %
US	16.1
United Kingdom	8.5
Italy	7.3
Germany	6.9
Spain	6.0
Canada	4.8
Switzerland	4.6
Belgium	4.3
China	2.6
Brazil	2.5
Other	36.4

Source: Scopus database (Elsevier); DZHW calculations

countries. Proportionally, the largest increases in other countries of origin can be observed in China and Germany (+7 and +3 percentage points respectively).

Finally, it is striking that China and India (for certain host countries) grew in significance as countries of origin, compared to the period from 2014 to 2016.[2] Another notable development is the decline in the share of western countries of origin in China as a destination country, which is particularly marked for academics and researchers from the US. By contrast, the proportions for Asian-Pacific countries (excluding Japan) have increased.

A2.6 Incoming academic authors as a proportion of all academic authors in selected destination countries, in 2019[3, 4, 5]

Destination	Incoming academic authors in %
Hong Kong	10.1
Vietnam	8.9
Switzerland	8.8
Ireland	8.3
Iraq	8.0
Singapore	7.1
New Zealand	6.1
Austria	5.6
Colombia	5.5
Belgium	5.4
Canada	5.3
United Kingdom	5.3
Pakistan	5.0
Sweden	5.0
Norway	4.8

Destination	Incoming academic authors in %
Australia	4.7
Nigeria	4.5
Netherlands	4.4
Israel	4.0
Germany	3.6
South Africa	3.5
France	3.5
US	2.8
Spain	2.2
Italy	1.7
South Korea	1.6
India	1.5
Japan	1.2
China	0.9
Russia	0.7

Source: Scopus database (Elsevier); DZHW calculations

Footnotes

1 However, it is likely that this has been systematically under-reported, due to the exclusion of non-English language publications from the data used for this analysis.

2 Data for 2014 to 2016 can be found in bonus table A2B4.

3 Hong Kong as a science location was recorded as a separate destination and origin unit due to its special significance within China.

4 Destination countries and regions with at least 5,000 recorded academic authors (incoming and non-mobile) were considered.

5 Proportion of all (incoming and non-mobile) academic authors from each destination country.

2.3 Major countries of origin and their destination country profiles

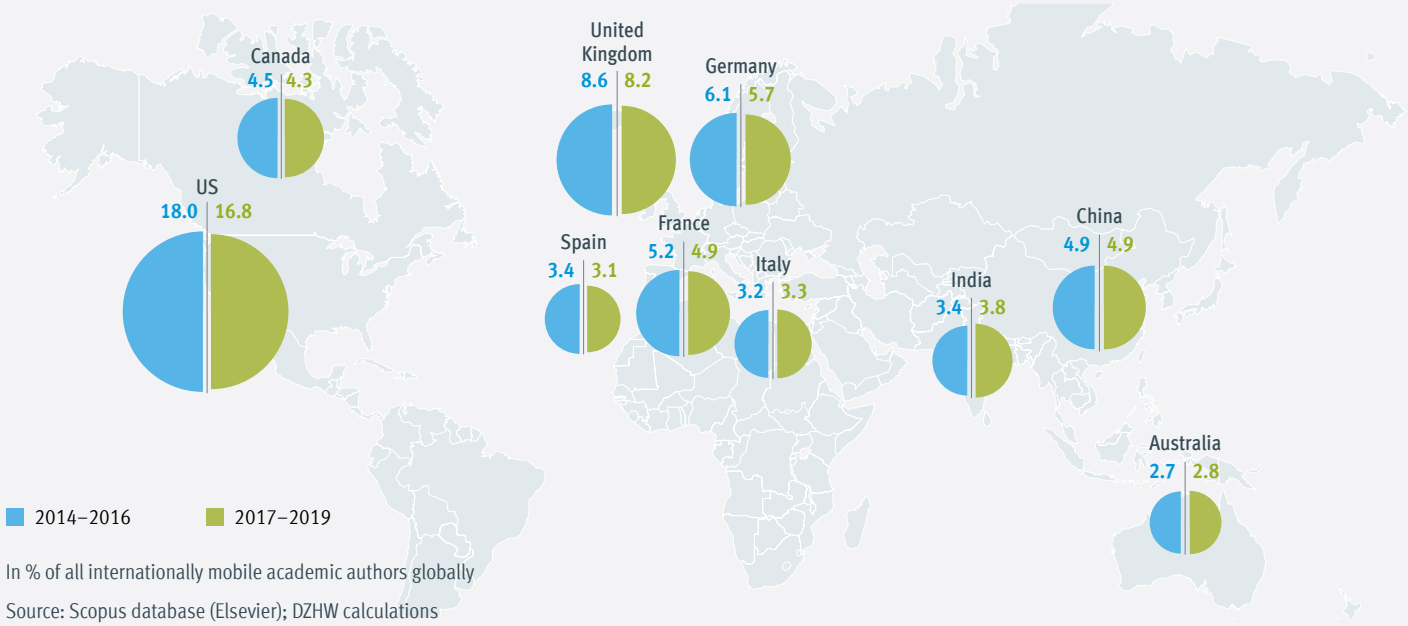
Not only is the US the leading destination country for internationally mobile academic authors – it is also the leading country of origin. Around 17% of all outgoing global mobility in our analysis for the period from 2017 to 2019 can be attributed to academics and researchers from the US. This finding presents a marked difference to international student mobility, where the US plays only a minor role as a country of origin (see pp. 16/17). Nonetheless, it should be noted that the mobile academics and researchers included in this analysis are not necessarily citizens of a given country of origin. This method of bibliometric analysis captures all academics and researchers who produced their first publication during the period under review (i.e. since 2000).[1] This makes it highly likely that, of the academics and researchers leaving the US, a (currently unquantifiable) proportion do not come from the US, but had already entered the US before the release of their first (bibliometrically recorded) publication (e.g. international doctoral students in the US). The United Kingdom (8%), Germany (6%), France and China (5% each) are the next highest ranked countries of origin, though they lag significantly behind the US. Compared to the period 2014 to 2016, the trend among the key countries of origin has largely been downwards in terms of their share of global incoming mobility. This particularly applies to the US (–1.2 percentage points), the United Kingdom and Germany (–0.4 percentage points each).

> “Hong Kong has the highest percentage of outbound scholars (12%), followed by Bangladesh (10%), Singapore (8%) and Saudi Arabia (7%).

If we consider outgoing academics and researchers as a proportion of all academics and researchers in a given country, mobility rates are highest for academics and researchers from Asian countries and regions, as is the case for incoming mobility (see pp. 26/27). At 12%, Hong Kong has the highest percentage of outbound scholars (12%), followed by Bangladesh (10%), Singapore (8%) and Saudi Arabia (7%). The first European countries are Switzerland and Ireland, in fifth and sixth places respectively (7% outgoing academics and researchers each), followed by New Zealand, the United Kingdom and Belgium (6% each). Germany’s share of 4% puts it 25th in the rankings, below Austria and the Netherlands (5% each) but above the US (3%), China and Japan (1% each).

As with the countries of origin (see p. 26/27), the US shows a rather diverse destination country profile. China, the United Kingdom and Canada, as the key destination countries, together account for only about 30% of all academics and scientists leaving the US. The share of the three key destination countries for academic authors from China (52%) and Canada (57%) is significantly higher in comparison. Regional anomalies are evident with regard to the key destination countries, for example, among academics from Germany. Here, a pronounced preference can be observed for the German-speaking countries of Switzerland and Austria. Hong Kong, Japan, Taiwan and Singapore are particularly favoured as destinations by academics and researchers from China.

A2.7 Internationally mobile academic authors as a proportion of all internationally mobile academic authors globally, by key countries of origin, from 2014 to 2016 and 2017 to 2019



In % of all internationally mobile academic authors globally

Source: Scopus database (Elsevier); DZHW calculations

A2.8 Key destination countries or regions for internationally mobile academic authors from the six key countries of origin, from 2017 to 2019[2]

Country of origin: US

Destination: Top 10	Proportion in %
China	11.0
United Kingdom	9.9
Canada	8.6
Germany	5.7
India	4.9
France	4.0
South Korea	3.8
Japan	3.7
Australia	3.2
Switzerland	2.7
Other	42.5

Country of origin: United Kingdom

Destination: Top 10	Proportion in %
US	22.1
Germany	6.6
Australia	6.1
China	4.5
France	4.3
Canada	4.0
Ireland	3.3
Spain	3.0
Italy	3.0
Netherlands	2.9
Other	40.3

Country of origin: Germany

Destination: Top 10	Proportion in %
US	18.8
United Kingdom	10.1
Switzerland	9.4
Austria	5.7
France	5.0
China	4.4
Netherlands	4.3
Italy	3.0
Spain	2.8
Sweden	2.5
Other	34.0

Country of origin: China

Destination: Top 10	Proportion in %
US	37.0
Hong Kong	10.4
United Kingdom	5.0
Australia	5.0
Germany	4.8
Japan	4.4
Canada	3.8
Taiwan	3.5
Singapore	3.5
Pakistan	2.6
Other	20.2

Country of origin: Canada

Destination: Top 10	Proportion in %
US	44.1
United Kingdom	7.8
China	4.9
France	4.7
Australia	3.6
Germany	3.0
Saudi Arabia	2.2
India	1.8
Switzerland	1.8
Iran	1.7
Other	24.5

Country of origin: France

Destination: Top 10	Proportion in %
US	16.8
United Kingdom	8.6
Germany	6.7
Switzerland	6.4
Canada	5.7
Italy	4.1
Belgium	3.9
Spain	3.6
China	3.3
Netherlands	2.1
Other	38.8

Source: Scopus database (Elsevier); DZHW calculations

An examination of the key countries of origin and destination countries for mobile academics and researchers from or in China (see also pp. 26/27) also reveals a highly intense exchange of academics and researchers between Hong Kong and mainland China. Compared to the period from 2014 to 2016, China's significance as a destination has increased strikingly.[3] Between 2014 and 2016, China was still only the sixth most popular destination country for academics and researchers from the United Kingdom, but for the period from 2017 to 2019, it rose to fourth place, above Canada and France.

A2.9 Outgoing academic authors as a proportion of all academic authors in selected countries of origin, in 2019[2, 4, 5]

Origin	Outgoing academic authors in %
Hong Kong	12.1
Bangladesh	9.6
Singapore	8.2
Saudi Arabia	7.3
Ireland	7.0
Switzerland	6.5
New Zealand	5.8
United Kingdom	5.7
Canada	4.8
Pakistan	4.7
Colombia	4.7
Austria	4.7
Netherlands	4.5
France	4.2
South Africa	4.1

Origin	Outgoing academic authors in %
Australia	4.0
Sweden	3.9
Israel	3.9
Nigeria	3.8
Germany	3.6
Vietnam	3.2
Spain	2.9
Italy	2.6
US	2.5
India	2.5
Iraq	2.0
South Korea	1.9
Japan	1.4
Russia	0.9
China	0.7

Source: Scopus database (Elsevier); DZHW calculations

Footnotes

1 In bibliometric analyses of academic mobility, the country of origin is defined as the country of location of the institution issuing the first publication during the period under review. It is possible that this fails to account for prior mobility and that the purported country of origin is actually a destination country (see also info box on methodology, pp. 20 f.).

2 Hong Kong as a science location was recorded as a separate destination and origin unit due to its special significance within China.

3 Data for 2014 to 2016 can be found in bonus table A2B7.

4 Countries and regions of origin with at least 5,000 internationally mobile academic authors (outgoing and non-mobile) were considered.

5 Proportion of all (outgoing and non-mobile) academic authors from each country of origin.

2.4 International academics and researchers at public universities and research institutions

The data available on internationally mobile academics and researchers at host universities abroad are significantly inferior to the corresponding data on students abroad. To date, there are no internationally comparable UNESCO or OECD statistics on this, unlike worldwide student mobility. This can chiefly be explained by the fact that, in many countries, international higher education staff are not recorded with sufficient granularity (e.g. with regard to countries of origin). The only exception is for international doctoral students as these are included in student statistics in most countries.

The US is by far the most important host country for international doctoral students. Around 155,000 early career academics and researchers were working towards doctoral degrees at US universities in 2018. After a clear margin, this is followed by the United Kingdom (46,000), France (25,000), Germany (26,000) and Australia (19,000). However, it should be noted that no figures are yet available on international doctoral students in countries such as China, India or South Africa.

As with the key host countries for international students, a distinction can be made between those countries with the largest absolute number and those with the largest proportion of international doctoral students. Luxembourg (86%), Switzerland (56%), New Zealand (44%) and the Netherlands (49%) record particularly high shares of international doctoral students. These small and medium-sized countries evidently not only stand out due to their strong research universities, but also by offering attractive opportunities for international doctoral candidates.

A2.10 Host countries with the highest numbers and proportions of doctoral candidates, in 2018[4, 5, 6]

Host country	Number of international doctoral candidates
US	154,866
United Kingdom	46,163
France	25,265
Germany	26,265
Australia	19,241
Canada	18,719
Japan	15,201
Spain	14,661
Switzerland	14,102
South Korea	8,510

Host country	Proportion of international doctoral candidates in %
Luxembourg	85.9
Switzerland	55.9
New Zealand	49.5
Netherlands	44.0
US	43.7
Belgium	41.5
United Kingdom	41.5
France	38.2
Denmark	36.2
Sweden	35.6

Sources: OECD student statistics; Federal Statistical Office student statistics; US Department of Homeland Security SEVIS data; country-specific reporting periods; DAAD calculations

Footnotes

1 Major host countries were defined as those with more than 4,000 international doctoral students according to the OECD or more than 100,000 international students according to UNESCO in 2018. National data were available for 15 of the 23 countries falling within this definition. Data were not available for Australia, Argentina, Belgium, China, Canada, New Zealand, Russia and the Czech Republic.

2 For example, many of the national statistics on academic staff do not specify which groups are included or at what point in an academic or researcher's career they are first added. For example, whether student assistants or visiting researchers with temporary stays are considered academic staff can have a decisive impact on the statistics. As the goal here was to capture only full-time staff, these two groups have been excluded from the data presented here wherever possible.

3 Data in the respective countries cover the following categories (all by headcount, not FTE): US: foreign research and teaching staff without immigrant visas at research universities in 2017/18; United Kingdom: foreign academic staff at universities in 2017/18; Germany: foreign full-time academic staff at universities and non-university research institutes in 2018; Switzerland: foreign university staff in 2018; France: foreign full-time teaching and research staff at universities and non-university research institutes in 2017/18; Japan: foreign academic staff at universities in 2018; Netherlands: foreign academic staff at universities in 2018; Austria: foreign academics and researchers at universities in 2018; South Korea: foreign professors, academics and researchers in 2018; Spain: foreign teaching and research staff at public universities (PDI/PEI) in 2017/18; Turkey: foreign teaching staff at universities in 2017/18; Sweden, Finland, Italy, Portugal: foreign academic staff in 2016 (ETER definition), as no current data are yet available.

4 Only countries with at least 500 internationally mobile doctoral students.

5 International doctoral candidates in the US: data from the US Student and Exchange Visitor Information System (SEVIS) database, (consulted December 2018), as not included in OECD statistics.

6 International doctoral candidates in Germany: Federal Statistical Office (Destatis) data, which include almost all registered doctoral candidates (26,265 persons); the UNESCO data, based on a Destatis survey of doctoral students, are too low at 23,900 persons.

7 Including data on international doctoral candidates in the US and Germany taken from SEVIS and Federal Statistical Office statistics (see footnotes 5 and 6).

8 Including Hong Kong and Macau.

9 Figure for domestic doctoral candidates refers to 2017 as no data for 2018 were available.

China is a long way ahead of all other countries as the key country of origin for internationally mobile doctoral candidates. Around 92,000 students from China were studying at universities abroad in 2018. India (32,000), Iran (21,000) and Germany (14,000) are next on the list. The US, with around 8,000 doctoral students, ranks in 10th place. At only 7% of all doctoral candidates in the country, the share of internationally mobile doctoral candidates in Germany is relatively low. In some developing and threshold countries, this proportion is much higher, such as Ecuador (96%), Sri Lanka (76%), Nepal (75%), Ghana (50%) and Saudi Arabia (49%). The strikingly high proportion in Ecuador can be explained by the very limited opportunities for doctoral candidates in the country. Candidates can only complete doctorates at six universities in Ecuador.

To obtain a more comprehensive picture of the mobility of academics and researchers than is possible with data on international doctoral students worldwide alone, research was conducted on international academic staff at public higher education and research institutes in major host countries in preparation for the *Wissenschaft weltoffen* report.[1] When comparing these national data, it should be noted that the definitions of academic staff, universities and research institutes differ from country to country.[2] In collecting this data, the goal was, as far as possible, to capture full-time international academic staff.[3]

Looking at the 15 host countries for which data were collected, the US proves to be by far the most important host country, with around 135,000 international academics and researchers at US universities. It is followed by the United Kingdom (64,900), Germany (56,800), Switzerland (29,200) and France (14,800). Particularly striking here is the low number of foreign researchers in France in direct comparison with Germany, despite the inclusion of academic staff at non-university research institutes (as was also the case for Germany). Language may present more of a barrier to recruiting international academic staff in France than in Germany and other countries, where English is often the dominant working language in scientific disciplines.

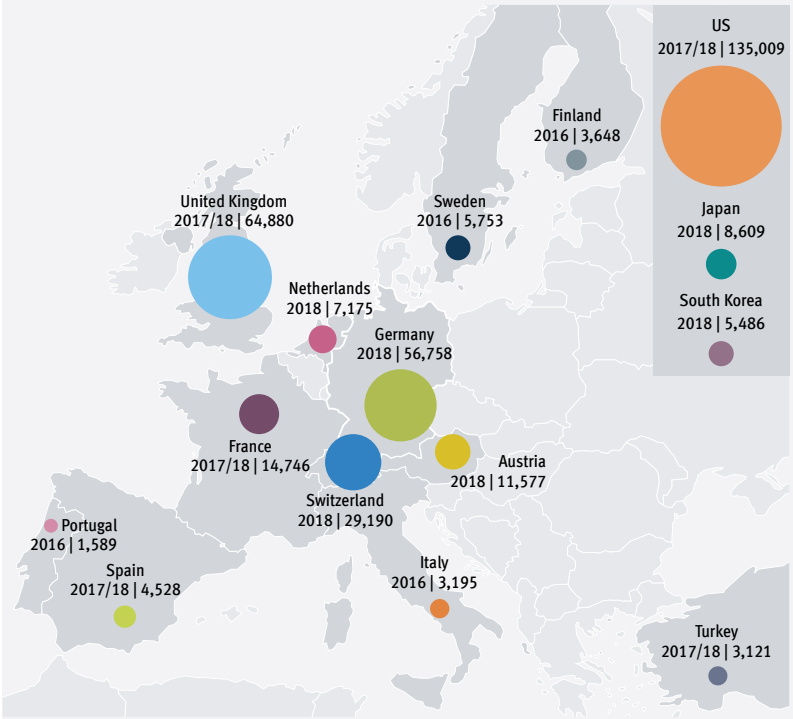
A2.11 Countries of origin with the highest numbers and proportions of internationally mobile doctoral candidates, in 2018[4, 7]

Country of origin	Number of internationally mobile doctoral candidates
China[8]	92,211
India	32,231
Iran	20,644
Germany	14,381
Italy	13,787
South Korea	13,701
Brazil	9,198
Saudi Arabia	8,677
Canada	7,832
US	7,811

Country of origin	Proportion of internationally mobile doctoral candidates in %
Ecuador	95.7
Sri Lanka[9]	75.7
Nepal[9]	74.5
Ghana	50.1
Saudi Arabia	49.4
Colombia	48.7
Lebanon	39.8
Bangladesh	35.6
Chile	33.2
Italy	32.7

Sources: OECD student statistics; Federal Statistical Office student statistics; US Department of Homeland Security SEVIS data; country-specific reporting periods; DAAD calculations

A2.12 International academics and researchers at public universities and research institutes of major host countries[3]



Sources: Respective countries' statistical agencies and academic organisations; ETER database (Finland, Italy, Portugal, Sweden); country-specific reporting periods and staff definitions

2.5 International co-publications

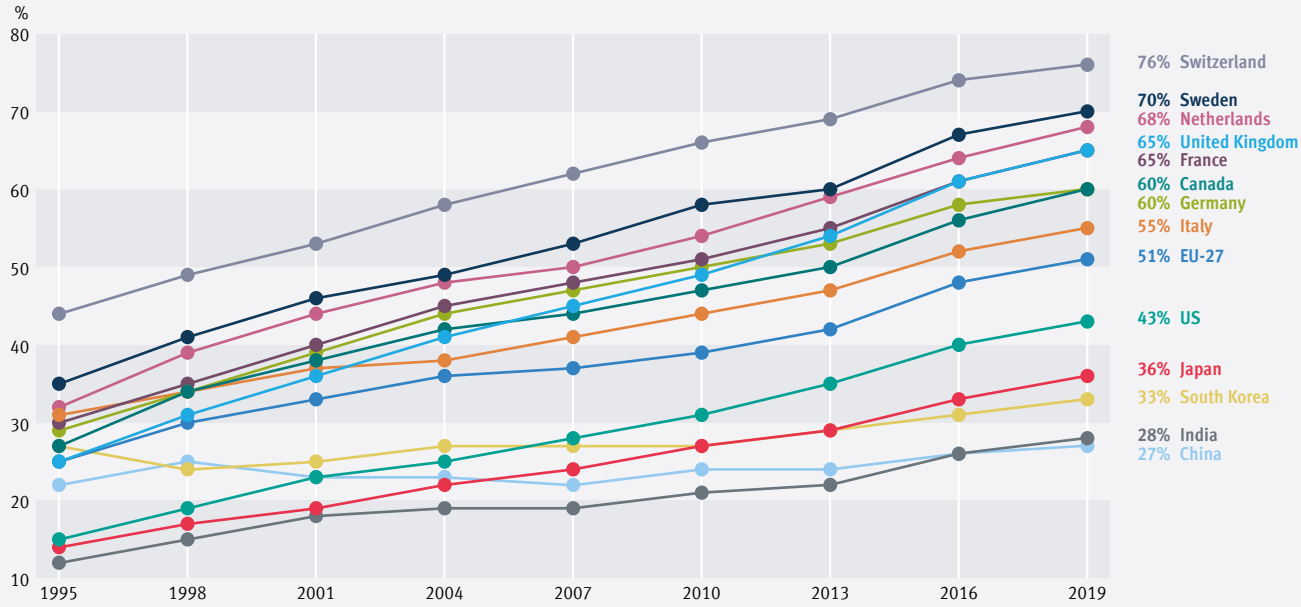
Scientific co-publications that are based on transnational cooperation are an important indicator of international networking of academics and researchers in different countries. These international co-publication networks can be analysed with the help of international publication and citation databases (see the info box on data basis). According to data from the Scopus database of publications and citations, 76% of all publications in which academics and researchers in Switzerland were involved in 2019 were written jointly with authors in other countries. The only other countries where this proportion topped 60% were Sweden (70%), the Netherlands (68%), the United Kingdom and France (65% each). Germany and Canada follow at 60% each, then Italy (55%). Taken as a whole, the share for all 27 EU countries is 51%. China (27%) and India (28%) have particularly low percentages, as do South Korea (33%), Japan (36%) and the US (43%).

> “In all countries considered here the proportion of international co-publications has increased since 1995, with particularly strong growth in Japan, the United Kingdom and the US.

It is therefore evident that smaller countries in particular have comparatively high proportions of international co-publications. An important reason for this is that academics and researchers in these countries are more dependent on co-authors in other countries for their research than those in larger countries, who can also reach a larger number of potential co-authors within their own country. Another significant observation arising from these data is that negligible proportions of international co-publications are not restricted to countries with relatively low levels of development in academia (one of the factors usually linked to limited international networking). In the cases of the US and Japan, despite their highly developed scientific systems, these countries have a comparatively low record of international networking in terms of transnational co-authorships. Co-authors in these countries are obviously sought more within their own academic systems than in other countries. Since 1995 there has been an uninterrupted growth in the proportions of international co-publications in the countries included here. That said, the increases since 1995 for Japan (+164%), the United Kingdom (+165%) and the US (+182%) have been particularly sizeable. The shares of international co-publications have also more than doubled since 1995 in Sweden (+103%), Germany (+109%), the Netherlands (+113%), France (+116%), Canada (+123%) and India (+131%). By contrast, markedly low levels of growth can be observed for South Korea (+24%) and China (+20%).

If one regards the share of international co-publication of a country as an indicator of the internationalisation of academic collaboration, the question arises as to whether certain countries dominate these relations and which countries are involved.[1]

A2.13 Proportions of international co-publications, by selected countries of residence of the authors and in the EU-27, since 1995[2]



Sources: Commission of Experts for Research and Innovation (EFI), Scopus Data (Elsevier); DZHW calculations

Data basis

These data are taken from the annual "Performance and Structures of the German Science System" publication (2021), by the Commission of Experts for Research and Innovation (EFI). The bibliometric analyses were carried out by DZHW using data from the Scopus international database of publications and citations (by Elsevier). Scopus lists most articles published in academic journals worldwide. The majority of the journals are in English. For each article, the country of the institution at which the respective authors were employed at the time of publication is recorded. On this basis, a differentiation can be made between national and international co-publications. However, bibliometric analyses are subject to several important limitations. One significant limitation is that they only capture researchers who have already published in academic journals recorded in the publication database used here. These are primarily English-language journals for the natural sciences and economics. Researchers from disciplines in which monographs and anthologies also play an important role as publication media – the humanities and social sciences for the most part – are strongly under-represented.

Among the countries considered here, Canada (52%), China (48%) and Japan (45%) show a high concentration in the three countries where most of their international co-authors are based. By contrast, the proportions for Germany, France and Sweden are only around 30%. The diversification of international co-authorships is therefore comparatively high.

On determining the five key countries of residence of co-authors for all the countries considered here, it first becomes clear that the US is without exception the most important location for co-authors in all these countries, often by a clear margin to the second key country. This is particularly obvious in the case of China and Canada, where authors in the US account for at least 30% of international co-publications. Germany, the United Kingdom and China are also among the five key locations for international co-authors in all the other countries considered here.

Footnotes

1 See also Zhao/Wei (2018).

2 The absolute or whole count method is used here. This is understood as the simple attribution of a publication to a study unit. A publication is fully attributed to each institution involved in its production. If several institutions are involved in the production of a publication, the publication is attributed once to each of the institutions.

3 The fractional counting method based on the number of participating institutions is used here. This counting method shows a given country's involvement in a publication as a share of the number of participating institutions in that country. For example, if a publication is produced by authors from one German, one French and one Swiss institution, using the fractional counting method, one third of the publication is assigned to Germany, France and Switzerland each respectively.

A2.14 Proportion of key countries of residence of academics and researchers' international co-authors in selected countries, in 2019[3]

Country of residence	Country of residence of co-authors	Proportion in %	Total of the top three key countries of residence of co-authors
China	US	34.5	48
	United Kingdom	7.8	
	Canada	5.2	
	Germany	4.3	
	Japan	4.3	
Germany	US	16.6	33
	United Kingdom	8.3	
	China	8.0	
	France	5.3	
	Italy	4.8	
France	US	14.3	30
	Germany	7.7	
	United Kingdom	7.5	
	Italy	7.0	
	China	6.3	
United Kingdom	US	16.4	36
	China	12.9	
	Germany	6.8	
	Italy	5.4	
	France	4.2	
Japan	US	20.6	45
	China	18.8	
	Germany	5.5	
	United Kingdom	5.0	
	South Korea	4.1	
Canada	US	29.9	52
	China	16.0	
	United Kingdom	6.2	
	France	4.4	
	Germany	4.1	
Netherlands	US	15.4	37
	United Kingdom	11.0	
	Germany	11.0	
	China	6.5	
	Italy	5.4	
Sweden	US	13.8	31
	United Kingdom	9.0	
	Germany	8.1	
	China	8.1	
	Italy	4.6	
Switzerland	US	16.3	41
	Germany	15.8	
	United Kingdom	8.7	
	France	7.7	
	Italy	7.5	
US	China	26.6	40
	United Kingdom	7.0	
	Canada	6.3	
	Germany	5.9	
	France	3.5	

Sources: Commission of Experts for Research and Innovation (EFI), Scopus Data (Elsevier); DZHW calculations

2.6 European academic collaboration in the EU's Research Framework Programme Horizon 2020

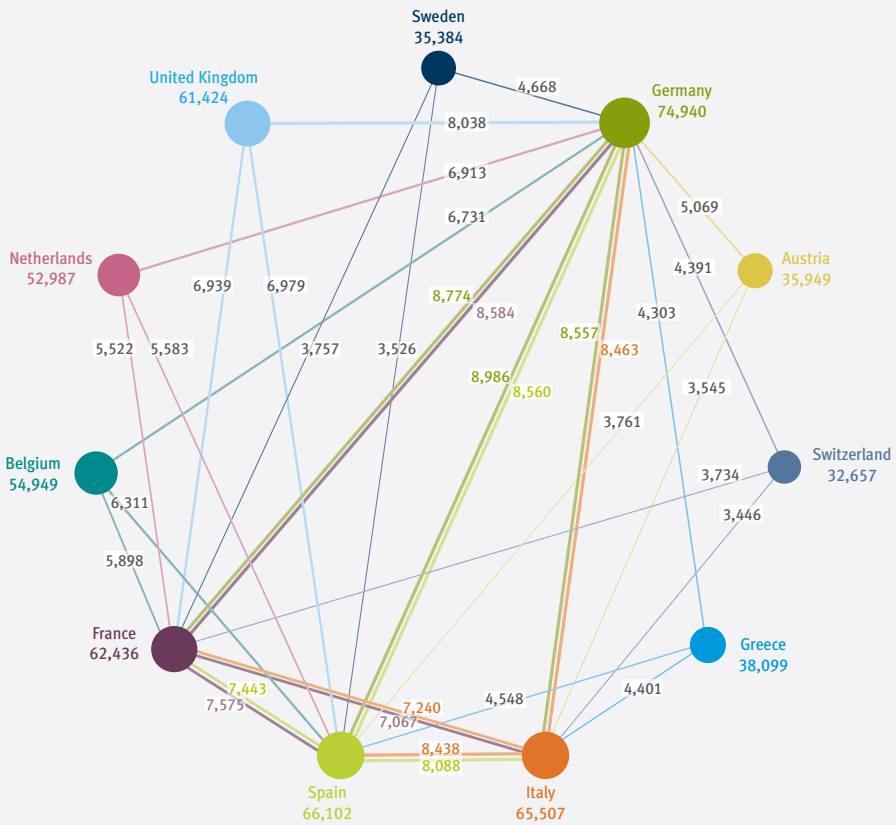
The European Union's "Horizon 2020" Research Framework Programme (RFP) is proving to be an important instrument for promoting the internationalisation and international mobility of academia and research in the participating countries. In addition to academic excellence, a prerequisite for projects within this RFP is usually the initiation of an international consortium of cooperating institutions. These consortia, which may include businesses in addition to universities and non-university research institutes, must each include three independent institutions from three different EU member states or associated states.[1] Carrying out an EU research project therefore requires substantial cooperation with institutions in other countries and is therefore a further indicator of the participating academics and researchers' degree of networking.

> "The number of international cooperation links through the Horizon 2020 programme ranges from 32,700 for Switzerland to 74,900 for Germany.

However, this potential for internationalisation did not exist in the EU's RFPs from the outset. Moreover, the programmes have changed over time with the development of the research systems and their funding, and also with the process of European integration as a whole.[2] Not only have RFPs evolved in terms of their content and focuses, but their funding volume has also grown continuously since the first programme. While the funding for the first period amounted to 3.3 billion euros, it totalled 56 billion euros for the seventh round of the project and rose again to 80 billion euros for Horizon 2020.

The impact of Horizon 2020 (H2020) on internationalisation stems from networking between academics and researchers. To analyse the extent of this networking, we may consider examples of international cooperation (or, more precisely, the international cooperation links) between one country and other countries in the

A2.15 Cooperation links for the 11 key countries in the EU's Research Framework Programme Horizon 2020 (2014–2020)[3, 4]



Total number of cooperation links of each country and number of links with the three respective top cooperation partners

Source: EU office of the Federal Ministry of Education and Research; calculations from EU ECORDA contract database (as of 5 January 2021)

Footnotes

1 The following countries are currently associated with Horizon 2020: Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Moldova, Montenegro, North Macedonia, Norway, Switzerland, Serbia, Turkey, Tunisia and Ukraine.

2 See Gaul/David (2009).

3 A cooperation link is the connection between two participating institutions from different countries within an EU-funded research project.

4 The United Kingdom's relatively modest significance as a cooperation partner is evidently connected to a Brexit effect. The involvement of British research institutions in H2020 projects dropped steadily from 2016. Prior to that, they had been at a comparable level to German research institutions. See also Scientists for EU (2021).

A2.16 Top 10 cooperation partners of the six key countries within the EU's Research Framework Programme Horizon 2020 (2014–2020)

Germany

Project partners	Number	in %
Spain	8,986	12.0
France	8,774	11.7
Italy	8,557	11.4
United Kingdom	6,861	9.2
Netherlands	5,304	7.1
Belgium	4,513	6.0
Greece	3,108	4.1
Austria	2,823	3.8
Sweden	2,568	3.4
Switzerland	2,268	3.0
Other	21,178	28.3

Spain

Project partners	Number	in %
Germany	8,560	12.9
Italy	8,088	12.2
France	7,443	11.3
United Kingdom	5,698	8.6
Netherlands	4,201	6.4
Belgium	4,010	6.1
Greece	3,006	4.5
Austria	2,269	3.4
Sweden	2,083	3.2
Portugal	1,942	2.9
Other	18,802	28.4

Italy

Project partners	Number	in %
Germany	8,463	12.9
Spain	8,438	12.9
France	7,240	11.1
United Kingdom	5,617	8.6
Netherlands	4,242	6.5
Belgium	3,923	6.0
Greece	3,044	4.6
Austria	2,129	3.3
Sweden	2,014	3.1
Switzerland	1,798	2.7
Other	18,599	28.4

France

Project partners	Number	in %
Germany	8,584	13.7
Spain	7,575	12.1
Italy	7,067	11.3
United Kingdom	5,661	9.1
Netherlands	4,133	6.6
Belgium	3,796	6.1
Greece	2,450	3.9
Sweden	2,014	3.2
Austria	1,947	3.1
Switzerland	1,868	3.0
Other	17,341	27.8

United Kingdom

Project partners	Number	in %
Germany	8,038	13.1
Spain	6,979	11.4
France	6,939	11.3
Italy	6,660	10.8
Netherlands	4,158	6.8
Belgium	3,466	5.6
Greece	2,556	4.2
Sweden	1,955	3.2
Switzerland	1,795	2.9
Austria	1,776	2.9
Other	17,102	27.8

Netherlands

Project partners	Number	in %
Germany	6,913	13.0
Spain	5,583	10.5
France	5,522	10.4
Italy	5,363	10.1
United Kingdom	4,790	9.0
Belgium	3,412	6.4
Greece	1,847	3.5
Austria	1,713	3.2
Sweden	1,711	3.2
Switzerland	1,534	2.9
Other	14,599	27.6

Source: EU office of the Federal Ministry of Education and Research; calculations from EU ECORDA contract database (as of 5 January 2021)

context of H2020 research funding. A cooperation link of this kind represents a collaboration with an affiliated partner abroad in the context of a research project funded by H2020. The more institutions and countries involved in research projects of this kind, the more cooperation links are created. If an affiliate project consists of two Italian, three French and four German partners, that project creates seven international cooperation links for Italy, six for France and five for Germany.

In the following, the networking of the eleven key countries participating in the H2020 RFP is considered. Importance is measured here by the number of collaborative projects in which these countries are involved, funded under H2020. The numbers range from 1,900 for Switzerland to around 5,800 for Germany. This selection alone shows how effectively H2020 promotes the internationalisation of research in Europe. The number of international cooperation links ranges from around 32,700 for Switzerland to 74,900 for Germany (as of 05 January 2021). The number of cooperation links in which the eleven key European partners are involved ranges from around 4,400 between Switzerland and Germany to 9,000 between Germany and Spain. For the purpose of clarity, Fig. A2.15 shows only the links with the three key cooperation partners, that is, the countries with which each of the eleven countries listed has the most cooperation links. Germany, Spain, Italy and France are among the top three cooperation partners in most or – in the case of Germany – all of the other countries considered here. Fig. A2.15 therefore not only shows links with each of these countries' key cooperation partners, but also all other countries for whom they represent a top three cooperation partner respectively.[4]

If we consider only the six countries with the most affiliate projects funded under Horizon 2020 and their ten key cooperation partners in the FRP, a similar picture emerges in the choice and order of cooperation partners. Germany, Spain, France and Italy usually figure among the key cooperation partners, while the United Kingdom usually ranks fifth or sixth.[4] Other major partner countries are the Netherlands, Belgium, Greece, Sweden, Austria and Switzerland. The ten key H2020 cooperation partners make up between 3% and 14% for any given country. In total, almost three quarters (72%) of the research cooperation links of any given country are with that country's ten key cooperation partners, a figure that is almost identical for all countries considered here.

3.1 Locations and forms

Transnational education (TNE) refers to a sub-area of internationalisation where universities from one country take academic responsibility for study programmes offered in another country that are aimed at prospective domestic students. Thus, TNE primarily refers to the transnational mobility of content, structures and institutions. This is what distinguishes TNE from the primarily individual international mobility of students, academics and researchers. German universities are involved in transnational education projects at 55 locations in 32 countries around the world, offering 328 study programmes. This represents an increase of 37 programmes over 2020. Between 2015 and 2019, the number of students enrolled in German TNE projects rose continuously from around 26,000 to 33,000; in 2020, there was a slight decline in the number of students for the first time (of around 400 students, or 1.2%). Despite the Covid-19 pandemic, that number rose by 7.7% to 35,318 in 2021.[1, 2, 3]

The regional focus of German TNE projects is on North Africa and the Middle East (Egypt, Jordan, Oman, Turkey), and Asia and Pacific (China, Vietnam, Singapore, Kazakhstan, Kyrgyzstan). In this context, binational university projects are of particular importance. For example, 40% of the students in German TNE programmes alone are enrolled at the German University in Cairo (GUC). In addition, a further 27% of TNE students are in the North Africa and Middle East region, with 13% at the German-Jordanian University (DJU) in Amman, 9% at the Turkish-German University (TDU) in Istanbul and 6% at the German University of Technology (GUtech) in Oman at its Muscat campus. The projects in China – including the Chinese-German University College (CDHK) and the Chinese-German University of Applied Sciences (CDHAW) in Shanghai – together account for around 12% of the students enrolled in German TNE projects.

Methodology

The data presented here are based on reports from German universities whose TNE activities are currently being supported by the DAAD with funds from the Federal Ministry of Education and Research (BMBF), the Federal Foreign Office (AA) or the Federal Ministry for Economic Cooperation and Development (BMZ), or were funded in a start-up phase. This does not include the vast majority of double or multiple degree programmes of German universities with foreign, in particular European, higher education partners registered with the German Rectors' Conference, which are predominantly geared towards the mutual exchange of students (and are also financed by the DAAD from federal funds).[5] TNE activities established without DAAD funding are also not covered here. It is therefore not possible to present a complete overview of the TNE involvement of German universities here. However, it can be assumed that the data presented here cover the largest part of the overall TNE activity of German universities.

A3.1 Locations of German universities' TNE projects with current and former DAAD funding, in 2021

Source: DAAD, TNE statistics

Since only a few countries have collected TNE data thus far, and there is a lack of data and terminology relating to TNE activities internationally, it is not possible to make meaningful comparisons between TNE projects offered by different countries at national and international level. A classification framework for International Programme and Provider Mobility (IPPM), developed on the basis of international consultations and published in 2017, proposes a fundamental distinction between collaborative forms of TNE – in other words, those that are jointly offered by universities in the country of the provider and the host country – and independent TNE formats for which a foreign university is solely responsible.[4] Within these basic categories, a distinction is made between TNE activities at programme level, the establishment of complete TNE institutions, and distance learning programmes. Applying the IPPM classification to the German TNE data shows that cooperative formats continue to dominate in TNE projects where German universities are participating. 94% of all programmes are attributable to cooperative study programmes or binational universities and account for 97% of all enrolled students.

> “Despite the Covid-19 pandemic, the number of students enrolled in German TNE projects in 2021 rose by almost 8%.

Footnotes

1 Since the data from the German University in Cairo were not yet available in full at the time of going to press, conservative estimates were made for the missing values, assuming that they would remain at the level of the previous year. It is highly likely that the actual total figures are slightly higher than the values assumed here.

2 An academic year begins in the winter semester and ends in the summer semester of the following year (academic year 2021 = WS 2020/21 and SS 2021).

3 Including 445 students on a preparatory course at the GUtech.

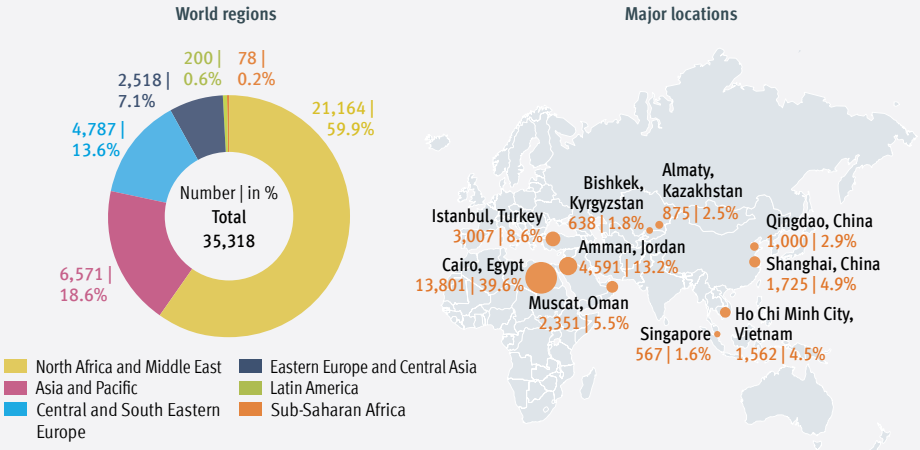
4 See Knight/McNamara (2017).

5 Thus, several hundred cooperation projects with universities in other countries for the award of double or joint degrees are not covered. This category includes study programmes offered by the German-French University (DFH) and around 100 DAAD-funded study programmes for international double or multiple degrees in 2020. Also not counted is an increasing number of around 200 doctorates currently being supervised at binational universities, often with co-supervision in Germany.

6 IPPM = International Programme and Provider Mobility, see also footnote 4.

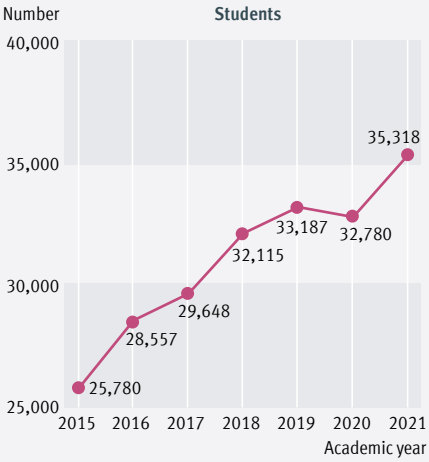
7 Not including 445 students currently on a preparatory year at GUtech.

A3.2 Students on German TNE projects currently or previously receiving DAAD funding, by region and major locations, in 2021[2]



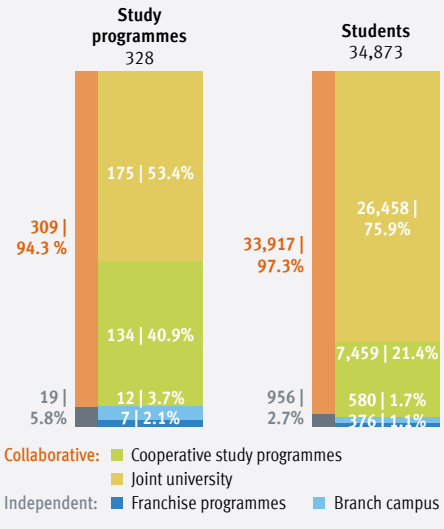
Source: DAAD, TNE statistics

A3.3 Students in German TNE projects currently or previously receiving DAAD funding, since 2015[1, 2]



Source: DAAD, TNE statistics

A3.4 German TNE projects, by joint IPPM classification, in 2021[6, 7]



Number and proportion in %

Source: DAAD, TNE statistics

3.2 Features of German TNE projects

Although it is difficult to formulate a clear-cut definition of the German approach to transnational education (TNE), due to the fluid transitions, a number of features can be identified that are generally characteristic of German TNE projects. In contrast to commercially oriented programmes, such as those developed by universities in Australia, the United Kingdom or the US, German TNE projects are characterised by the partnership-based pursuit of political objectives and the interaction between the following actors:

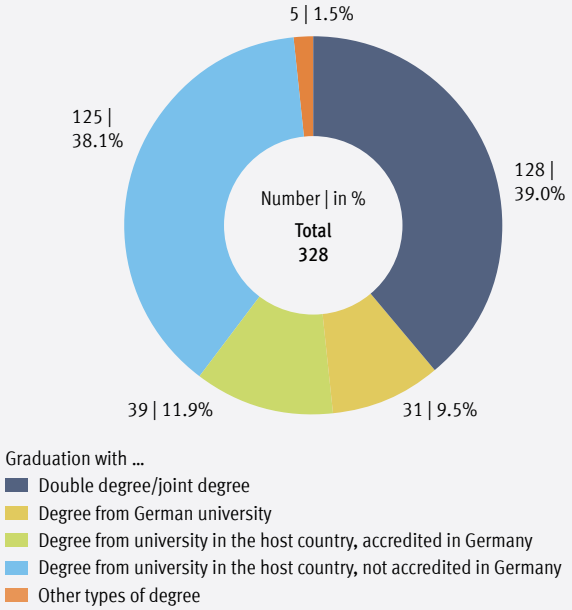
> “German transnational education projects are characterised by flexible instruments, a high degree of responsibility for shaping the future on the part of German universities and a partnership-based approach.

- German universities, whose commitment and assumption of academic responsibility play a decisive role in shaping the field of German TNE;
- universities and higher education policy stakeholders in the respective host country, whose regional skills and knowledge are decisive in successfully structuring TNE projects to meet the needs of target groups;
- financing ministries (BMBF, AA, BMZ), whose TNE funding addresses issues of foreign science policy, university internationalisation and development-related objectives;[1]
- the DAAD, which acts as a mediator and coordinator to ensure that the implementation of TNE projects serves the interests of all stakeholders.

Further important features of the German TNE approach include the following: the responsibility for academic matters rests with the participating German universities, usually by delivering or transferring quality-assured curricula; flexible and demand-oriented approaches that are jointly designed within the partnerships, and the strengthening of connections to Germany. For German universities, the DAAD and funding institutions, TNE activities are an important means of reinforcing ties between TNE students and Germany. In this context, the political objectives of foreign science policy (focusing on foreign institutions) and development promotion as well as the internationalisation of German universities (focusing on German institutions) complement each other.

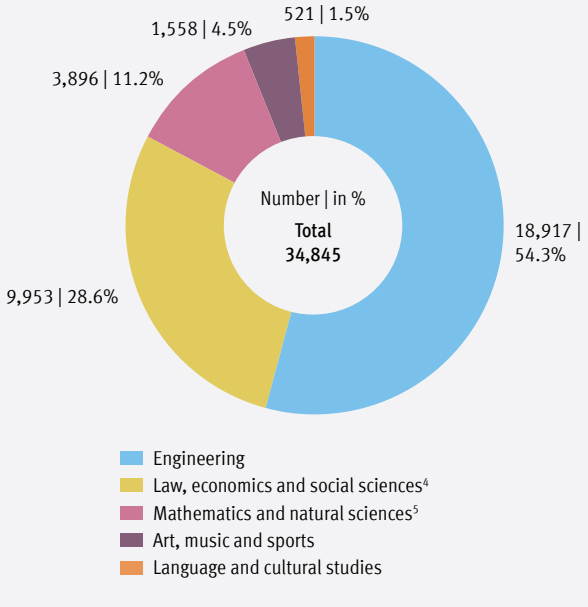
TNE study programmes promote connections to Germany in a range of ways: first and foremost is the curricular responsibility borne by German universities, which leads to the award of German degrees or a combination of German and foreign degrees. In just under half of the TNE study programmes covered (49%), a German university degree is awarded as the sole degree or in combination with a foreign degree as a double or joint degree.[2] Furthermore, some TNE programmes award a degree from the university of the respective host country, but the study

A3.5 TNE study programmes currently or previously funded by DAAD, by their connection to Germany, in 2021



Source: DAAD, TNE statistics

A3.6 Students on German TNE projects currently or previously receiving DAAD funding, by subject group, in 2021[3]



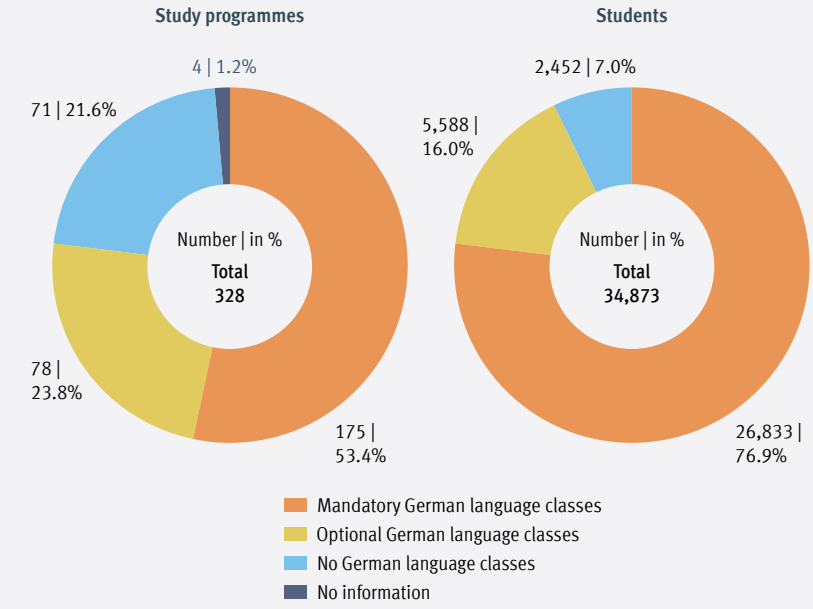
Source: DAAD, TNE statistics

programme is also accredited in Germany. This applies to 24% of the study programmes covered here.

In addition, the clear majority of TNE students (77%) are enrolled in study programmes that provide for compulsory German language instruction, while a further 16% can take advantage of optional German language classes. The curricula of a good quarter of TNE students (27%) also include a compulsory visit to Germany. A further two thirds of TNE students (64%) can complete an optional visit to Germany as part of their studies, which is fully integrated into the curriculum.

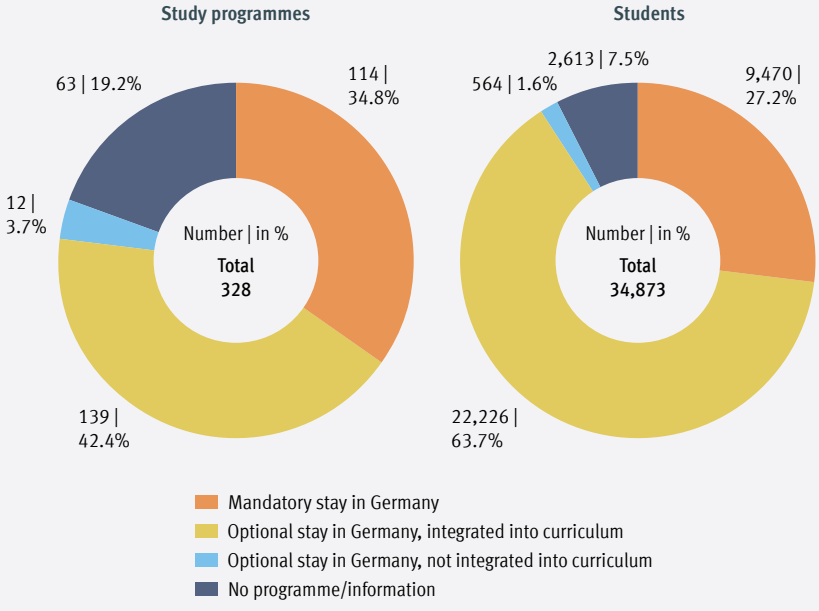
As in previous years, more than half (54%) of all TNE students are enrolled in engineering study programmes. This, too, can be seen as a distinctive feature of German TNE projects. Law, economics and social sciences (29%) as well as mathematics and natural sciences (11%) follow after quite a gap. Other subject groups only play a minor role. The overwhelming majority (83%) of students in the TNE projects captured here are aiming for an undergraduate degree (i.e. a bachelor's or comparable first degree) and 16% for a master's degree. Doctorates are only offered at a small number of TNE institutions and are not fully recorded statistically (1%).

A3.7 TNE study programmes and students on TNE study programmes currently or previously funded by DAAD, by provision of German language classes, in 2021[6]



Source: DAAD, TNE statistics

A3.8 TNE study programmes and students on TNE study programmes currently or previously funded by DAAD, by option of mobility to Germany, in 2021[6]



Source: DAAD, TNE statistics

Footnotes

1 BMBF: Federal Ministry of Education and Research; AA: Federal Foreign Office; BMZ: Federal Ministry for Economic Cooperation and Development.

2 In the case of a double degree, each partner university awards its own degree, documented either by two separate certificates or by a joint certificate listing both degrees. In the case of a joint degree, the partner universities award a joint degree, documented by a joint certificate.

3 Excluding 445 students currently on a preparatory year at GUtech and 28 doctoral students on the FDIBA project, who cannot be definitively assigned to a single subject group.

4 Incl. veterinary/agricultural/forestry/environmental sciences.

5 Incl. pharmacy.

6 Excluding 445 students currently on a preparatory year at GUtech.

1.1 Mobility trends, first-year students and federal states

In the 2019/20 winter semester, approximately 411,600 students[1] with foreign citizenship were studying at German universities. The majority of these (around 319,000 or 78%) achieved their university entrance certificate abroad and only came to Germany to study thereafter. In contrast to editions of *Wissenschaft weltoffen* prior to 2020, these students will be referred to as "international students". Unlike "Bildungsausländer", which is used only in Germany, this designation follows standard international usage.

> "The number of international first-year students has risen by 6% at universities of applied sciences and dropped by 1% at universities.

Compared to 2019, the number of international students in Germany rose by around 17,700 (6%) in the 2019/20 winter semester. The number of international students has thus been growing steadily for ten years by a total of 76%. With the increase in the number of international students, German universities are part of a wider global trend in international student mobility. As in Germany, annual growth of 5% has been recorded worldwide since 2010 (see p. 12/13).[2]

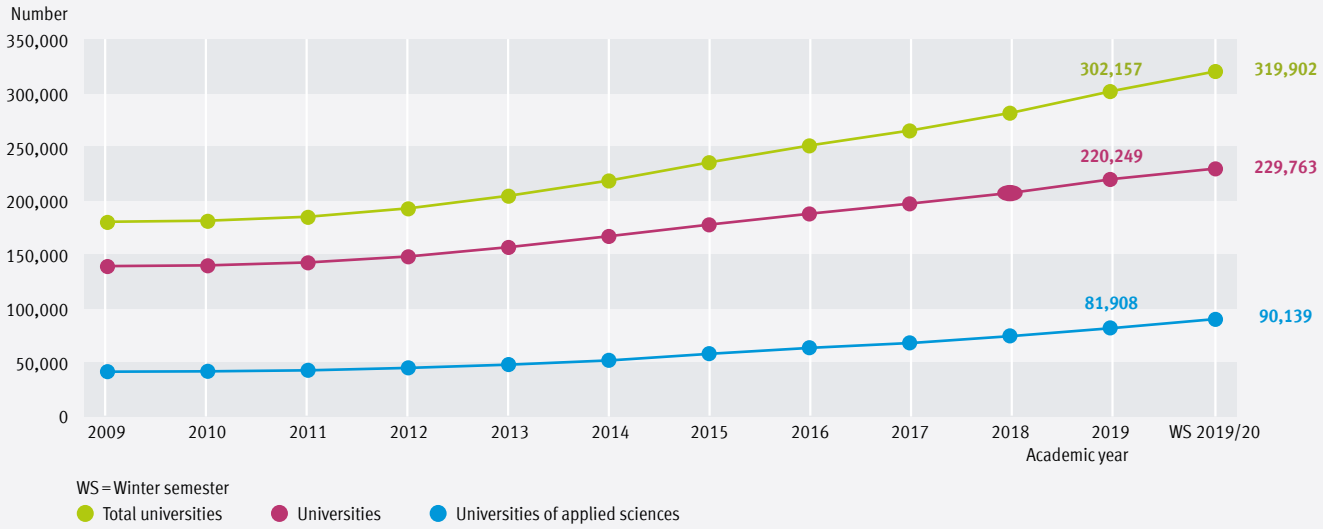
The majority of international students in Germany in the 2019/20 winter semester were enrolled at universities. There were around 229,800 such students, 72% of all international students. In the same period, 64% of German students were enrolled at universities. Although the number of international students at universities of applied sciences is significantly lower than at universities, the above-average growth rate that universities of applied sciences have been recording for years should not be overlooked. Compared to last year, the number of international students at these institutions increased by 10%.

The situation is similar regarding the relationship between private and public universities. In the 2019/20 winter semester, only about 23,600 (7%) of international students were enrolled at private universities but their number increased by 19% in one year, and by 289% in ten years.[4] By contrast, the vast majority – approximately 296,300 international students – studied at public universities. Their number increased by 5% compared to the previous year and by 69% compared to 2010.

In the 2019 academic year, around 111,000 international first-year students began their studies in Germany, 1% more than in the previous year.[5] This represented the lowest growth rate in the last ten years. It already indicates a trend that will continue in a stronger form due to the conditions of the pandemic in 2020 (see p. 60–63). Although they only made up 30% of all first-year students, the number of international first-year students at universities of applied sciences rose in 2018 by 6%, while the figure for universities dropped by 1%.

Both the positive trend in the number of international students and the stagnating numbers of German students contribute to the fact that international students as a proportion of all students in Germany rose by 11.1% between 2019 and the 2019/20 winter semester. For the second time in a row, international students thus represent more than one tenth of all students in Germany. This figure increased from 12.1% to 12.7% at universities and from 7.8% to 8.4% at universities of applied sciences. Percentages at private universities also went up. At these institutions, the share of international students rose from 7.1% to 7.9%. At public universities, the proportion rose from 10.9% to

B1.1 International students in Germany, by type of university, since 2009[1, 3]



Source: Federal Statistical Office, student statistics

11.4%. The highest figures were recorded by the public colleges of art and music, with 28.8%, and private universities, with 23.2%.

There are some considerable differences between the various federal states. Measured in absolute numbers, around half of all international students study in just three federal states: North Rhine-Westphalia, Bavaria and Baden-Wuerttemberg. Nonetheless, there are also high percentages in other federal states. The three leaders in this regard are Berlin (18%), Saxony (16%) and Brandenburg (15%). Although the above-average figures in the former East German states are also a result of reduced enrolment figures among German students, these federal states have nevertheless managed not only to prevent a decline in international students but in some cases to achieve significant increases in enrolment. The strongest increases over five years have been recorded by the universities in Thuringia (+87%) and Mecklenburg-Western Pomerania (+66%). Below-average figures, on the other hand, can be found in Saarland (+17%) and Baden-Wuerttemberg (+8%).

Footnotes

1 The data on international students for the 2019 academic year are taken from the official statistics for the 2018/19 winter semester. Figures for previous academic years also refer to the respective winter semester because, in the past, it could be assumed that there would be no significant changes in numbers of international students and their respective shares between the winter and summer semesters. This does not apply to the 2020 winter semester. Due to the Covid-19 pandemic and the associated changes to the conditions of study, the number of international students refers only to winter semester 2019/20 and not to the whole 2020 academic year.

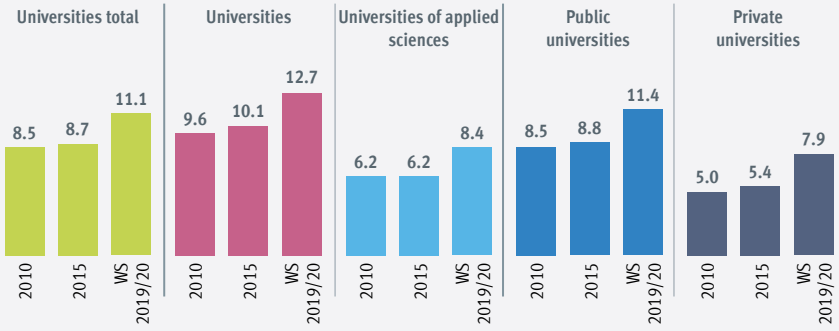
2 See OECD (2020).

3 Data for universities, including colleges of art, music, education and theology.

4 Data for private universities, including church-run universities.

5 The information for international first-year students refers to one academic year and includes the corresponding summer semester and the following winter semester. First-year students in the 2019 academic year = 2019 summer semester + 2019/20 winter semester.

B1.2 International students as a proportion of all students, by type of university and type of sponsor, in 2010, 2015 and winter semester 2019/20[1, 3, 4]

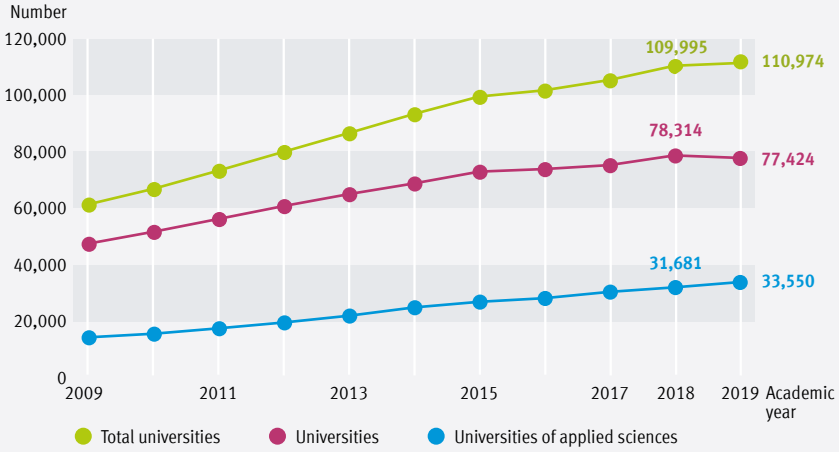


Academic year/semester

Number and % of all students; WS = Winter semester

Sources: Federal Statistical Office, student statistics; DZHW calculations

B1.3 International first-year students in Germany, by type of university, since 2009[1, 3, 5]



Source: Federal Statistical Office, student statistics

B1.4 International students, by federal state, in 2015 and winter semester 2019/20, with change 2015–WS 2019/20[1]

	2015		WS 2019/20		
Federal state	Number	in %	Number	in %	Change 2015–WS 2019/20 in %
Baden-Wuerttemberg	33,754	9.5	36,580	10.2	8.4
Bavaria	29,708	8.1	46,059	11.7	55.0
Berlin	23,859	13.9	35,864	18.3	50.3
Brandenburg	5,899	11.9	7,391	14.9	25.3
Bremen	3,861	10.8	5,156	13.7	33.5
Hamburg	7,665	8.0	10,707	9.7	39.7
Hesse	20,618	8.7	26,471	10.0	28.4
Mecklenburg-Western Pomerania	2,160	5.5	3,594	9.4	66.4
Lower Saxony	13,675	7.2	20,594	9.8	50.6
North Rhine-Westphalia	54,357	7.5	72,287	9.3	33.0
Rhineland-Palatinate	8,571	7.0	12,542	10.2	46.3
Saarland	3,435	11.6	4,016	12.8	16.9
Saxony	14,038	12.5	16,963	15.8	20.8
Saxony-Anhalt	5,696	10.4	7,565	13.9	32.8
Schleswig-Holstein	3,288	5.8	4,266	6.6	29.7
Thuringia	5,274	10.4	9,847	13.2	86.7
States total	**235,858**	**8.7**	**319,902**	**11.1**	**35.6**

Number and % of all students

Sources: Federal Statistical Office, student statistics; DZHW calculations

1.2 Regions and countries of origin

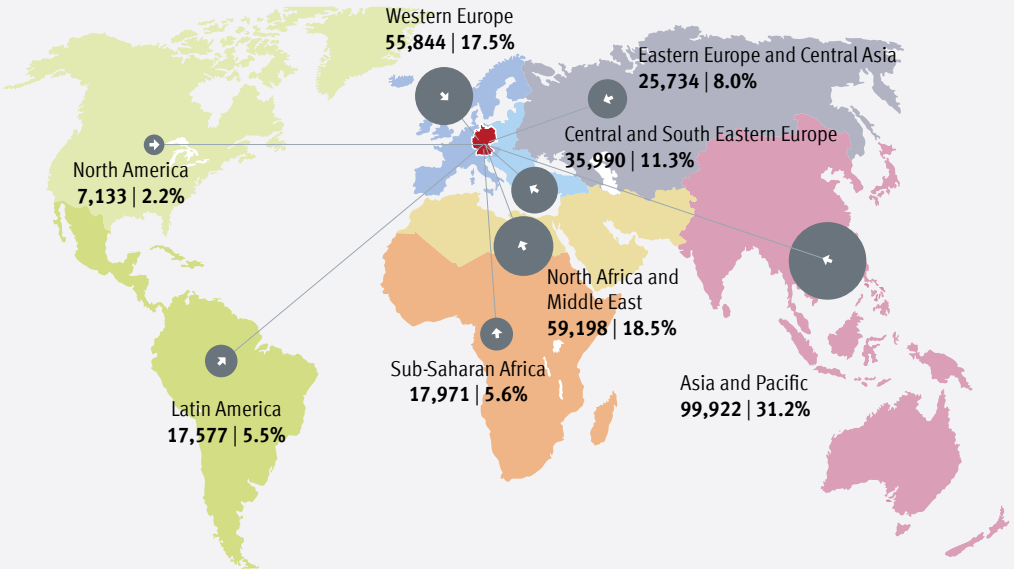
Asia and Pacific is the key region of origin for international students at German universities. Students from this region account for 31% all international students. Since 2017, the number of students originating from this region has also risen by 29%, above the average. Students from North Africa and Middle East follow in second place with 19%. They have increased by 77%, the largest of any group, pushing students from Western Europe into third place. Students from Western Europe have grown by only 5% over the past three years, now accounting for 18% of all international students. By contrast, hardly any increase in enrolment figures can be observed for students from Central and South Eastern Europe, who currently make up 11% of all international students. Finally, a slight decline in enrolment of 3% can be observed for the Eastern Europe and Central Asia region of origin. 8% of international students currently come from this region. The reasons for declining or only slightly increasing student numbers from Eastern, Central and South Eastern European countries are due less to declining interest in Germany as a study location than to demographic changes in some of these countries. In those countries, population figures in the age cohorts relevant to university study have declined significantly. Finally, Latin America and Sub-Saharan Africa each make up 6%. Students from North America make up the smallest group, at only 2%.

> “The number of Syrian students at German universities has almost tripled in recent years.

The considerable significance of students from Asian and Pacific countries of origin is in line with associated changes in global student mobility (see p. 12/13). Students from this region account for 41% of all internationally mobile students. This can be explained by demographic factors as 51% of the world’s population live in these countries. By way of comparison, only 6% live in Western Europe.[1] Another factor is that, in many countries in the region, such as China, India, Vietnam, South Korea and Indonesia are experiencing rapid economic development. This is the cause of the high levels of demand for well-educated academic staff in these countries, although there are still relatively few internationally prestigious universities. As a result, the great interest in studying abroad continues unabated.

The large number of Western European students at German universities compared to other countries is not only a sign of German universities’ attractiveness within Europe but also a result of the intensified student exchange between the countries in a region. It holds true for all regions of the world that an above-average proportion of mobility takes place within students’ own regions of origin. The strong growth in internationally mobile students from North Africa and Middle East is another global phenomenon, which is linked to political and social changes in the region.

B1.5 International students, by region of origin, in winter semester 2019/20



Total international students at German universities 319,902
(including 533 students who cannot be allocated to a country of origin)

Number and % of all international students at German universities

Sources: Federal Statistical Office, student statistics; DZHW calculations

Footnotes

1 Data on the world population are taken from the Federal Statistical Office Germany.

2 Only countries with at least 100 international students in winter semester 2019/20 (increase) or 2017 academic year (decrease).

Regional changes in international student mobility are also reflected in the rankings of countries of origin. At German universities, students from China have been in first place for 20 years. At 13%, they account for more than one in ten international students. Over the last three years their number has risen by a further 18% to around 41,400. Students from India, who are second in the rankings, have seen an even stronger increase. Since 2017, their number has risen by 62% to around 24,900. However, the biggest increase has been in students from Mauritius and Syria. In the latter case, this is due to the ongoing civil war. Over the past three years, their numbers have increased by 217% for Mauritius and 213% for Syria. This now puts Syria in third place out of the key countries of origin for international students in Germany. In 2019 alone, the number of Syrian students increased by 22% to around 15,900.

The key Western European countries of origin are Austria (around 12,000 students), Italy (around 9,400 students) and France (around 6,900 students). In the Eastern Europe and Central Asia region, Russia (around 10,500 students) and Ukraine (around 6,800 students) are out in front, although over the last three years there has been a 7% decline in students from Russia and 3% in students from Ukraine. The key countries in Central and South Eastern Europe are Turkey (around 9,500 students) and Bulgaria (around 6,000 students). Finally, if we look at the regions of North Africa and Middle East, and Sub-Saharan Africa, most students here – with the exception of those from Syria – come from Iran (around 9,400 students) and Cameroon (around 7,700 students).

Along with Mauritius and Syria, Nigeria (+134%), Eritrea (+106%) and Sri Lanka (+91%) have seen particularly significant increases in student numbers in Germany since 2017. In contrast, the sharpest declines in this period have been recorded for the United Arab Emirates (–78%), Gabon (–32%), Oman (–27%), Finland (–25%), Slovakia (–23%) and Moldavia (–23%).

B1.6 Key countries of origin, by proportion of international students, winter semester 2019/20 and change 2017–WS 2019/20

Country of origin	Number	Proportion in %	Change 2017–WS 2019/20 in %
China	41,353	12.9	+18
India	24,868	7.8	+62
Syria	15,948	5.0	+213
Austria	12,020	3.8	+14
Russia	10,507	3.3	–7
Turkey	9,473	3.0	+36
Italy	9,419	2.9	+10
Iran	9,353	2.9	+31
Cameroon	7,662	2.4	+3
France	6,881	2.2	–6
Ukraine	6,777	2.1	–3
Tunisia	6,461	2.0	+44
South Korea	6,461	2.0	+16
Spain	6,240	2.0	0
US	6,112	1.9	+5
Bulgaria	6,027	1.9	–12
Pakistan	5,968	1.9	+35
Morocco	5,842	1.8	+16
Vietnam	5,689	1.8	+38
Egypt	5,469	1.7	+69

Sources: Federal Statistical Office, student statistics; DZHW calculations

B1.7 Countries of origin with largest increases and decreases of international students, in 2017–WS 2019/20[2]

Country of origin	Change 2017–WS 2019/20 in %
Mauritius	+217
Syria	+213
Nigeria	+134
Eritrea	+106
Sri Lanka	+91
Albania	+73
Ghana	+70
Egypt	+69
India	+60
Kosovo	+59
UAE	–78
Gabon	–32
Oman	–27
Finland	–25
Slovakia	–23
Moldavia	–23
Sweden	–21
Poland	–19
Latvia	–19
Belarus	–15

Sources: Federal Statistical Office, student statistics; DZHW calculations

1.3 Types of degree and subject groups

38% of all international students at German universities in the winter semester 2019/20 were working towards a bachelor's degree and 39% towards a master's degree. Among German students the proportion studying for bachelor's degrees was 64% and 19% for master's degrees.

Compared to 2019, the number of international students on bachelor's programmes has increased by 7%, and by 9% for master's programmes. The number of master's students is rising slightly faster than for bachelor's students, although the rates of increase have converged strongly in recent years. A total of 8% of international students do not plan to complete their degree in Germany. These are exchange students or other students on temporary visits. They have decreased by 4% since last year. The regions of origin show different intentions concerning the type of degree they are aiming for. While international students from North Africa and Middle East (49%) and Sub-Saharan Africa (47%) are particularly likely to enrol in bachelor's programmes, students from Asia and Pacific (53%) and North America (45%) are more likely than average to aim for a master's degree.

> "35% of all international students at universities and 54% at universities of applied sciences are studying an engineering subject.

There are considerable differences between universities and universities of applied sciences with regard to intentions of graduates. At universities, significantly more international students are on master's programmes (42%) than on bachelor's programmes (29%). 12% intend to complete a doctorate in Germany. The ratio is reversed at universities of applied science, where 62% are studying for a bachelor's degree and 31% for a master's degree. Although the number of students studying for master's degrees at universities of applied sciences is lower, it remains the case that master's degrees at both types of institution are particularly attractive to international students. 22% of all master's students at universities come from abroad; at universities of applied sciences, this is 17%. It is only among doctoral students that international students make up a higher proportion, at 25%. However, while not all German doctoral students are enrolled at universities, residence permit requirements mean that around two thirds of international doctoral students are enrolled at universities. As a result, official enrolment statistics overestimate international doctoral students as a percentage of all doctoral students and the reality is likely to be somewhat lower. In all, international students make up 7% of all bachelor's students at universities and 6% at universities of applied sciences.

The strong interest shown by international students in the master's programmes offered by German universities is partly the result of a growing spectrum of relevant study opportunities, especially those offered in English. However, it is also in line with "the international norm" for students to complete a bachelor's programme as the first phase of academic education in their home country and then feel prepared for a master's programme abroad. The following applies to all host countries and countries of origin: the higher the desired level of education, the greater the proportion of internationally mobile students.[1]

B1.8 International students, by type of university and degree, winter semester 2019/20

Type of degree	Number			Proportion in %		
	Universities Total	Universities	Universities of applied science	Universities Total	Universities	Universities of applied science
Bachelor's degree	121,325	65,486	55,839	37.9	28.5	61.9
Master's degree	125,091	97,112	27,979	39.1	42.3	31.0
Doctorate	27,869	27,817	52	8.7	12.1	0.1
Other types of degree	20,658	19,036	1,622	6.5	8.3	1.8
Not working towards a degree	24,959	20,312	4,647	7.8	8.8	5.2
Total	**319,902**	**229,763**	**90,139**	**100**	**100**	**100**

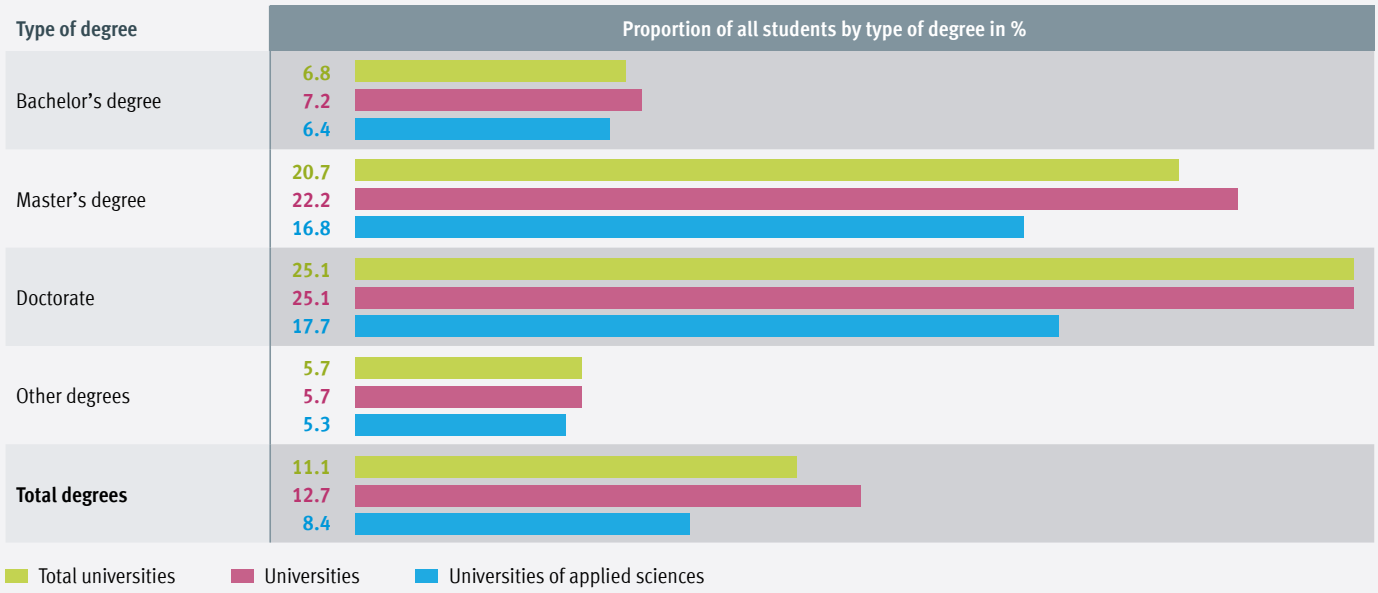
Sources: Federal Statistical Office, student statistics; DZHW calculations

An analysis of the enrolment figures by individual subject groups shows that the importance of engineering, in particular, has grown for international students. One in three international students is now enrolled in an engineering subject at a university (35%) and one in two at a university of applied sciences (54%). Students of law, economics and social sciences (universities: 21%, universities of applied sciences: 33%) make up a high proportion, as do humanities students at universities (15%), although the trend is downwards, along with mathemat-

Footnote

1 S. OECD (Ed.) (2020), p. 281*ff.*

B1.9 International students as a proportion of all students, by type of degree and university, winter semester 2019/20



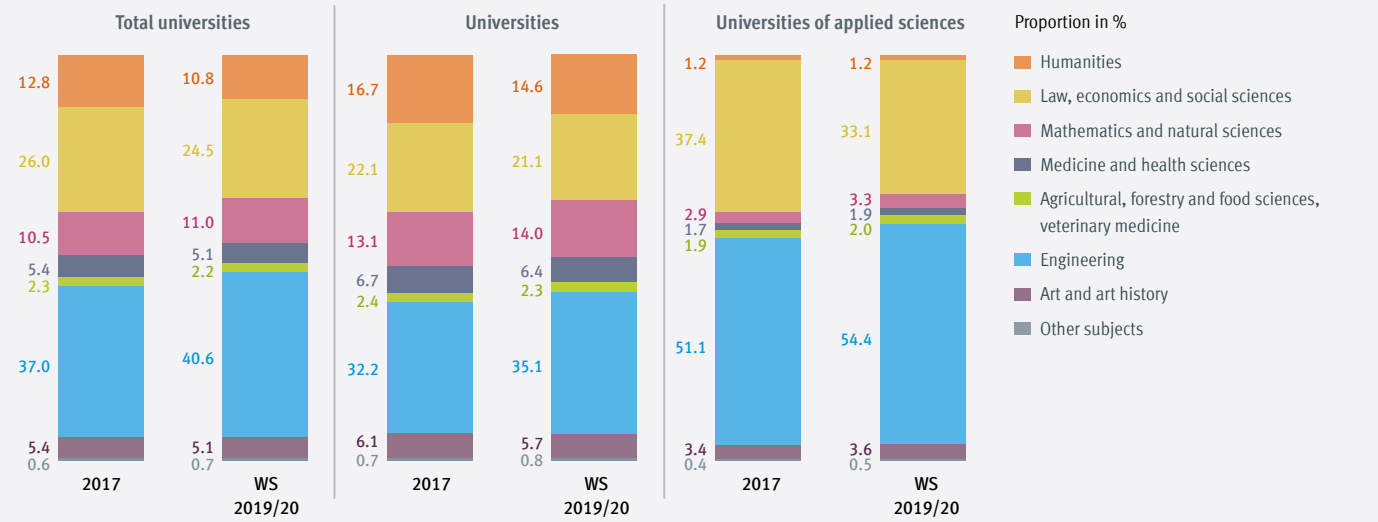
Sources: Federal Statistical Office, student statistics; DZHW calculations

ics and natural sciences (14%). By comparison, a higher share of German students are enrolled in law, economics and social sciences but also in the humanities, mathematics and natural sciences, and a lower percentage in engineering, art and art history.

In line with this level of interest, international students make up an above-average proportion of engineering students at both universities (23%) and universities of applied sciences (12%). This also applies to study programmes in art and art history at universities (20%), and mathematics and natural sciences (14%), and the humanities (11%) at universities of applied sciences.

However, international students' levels of interest in different subjects vary according to their region of origin. While students from European regions and North and Latin America are more interested than average in the subject areas of law, economics and social sciences, students from North Africa and Middle East, Asia and Pacific, and Sub-Saharan Africa enrol on engineering degrees particularly frequently.

B1.10 International students, by type of university and subject group, in 2017 and winter semester 2019/20



Sources: Federal Statistical Office, student statistics; DZHW calculations

2.1 Mobility trends, type of degree, subject group and graduates

Around 294,900 international students were studying for a degree at a German university in the 2019/20 winter semester. That figure represents an increase of 83% over ten years and 7% in 2019 alone. This means that degree-related international mobility is currently more dynamic than temporary study-related mobility (see p. 54/55). The attractiveness of a degree in Germany has evidently continued to grow internationally. Universities of applied sciences have enjoyed particularly strong growth, with a 61% increase since 2015 in international students intending to graduate. Growth at universities is 35%. Nevertheless, the vast majority (71%) of international students seeking a degree are still enrolled at universities. The consequence of these developments is that 10.3% of all students at German universities are now international students seeking a degree. At universities, this proportion is 11.7%, with 8% for universities of applied sciences.

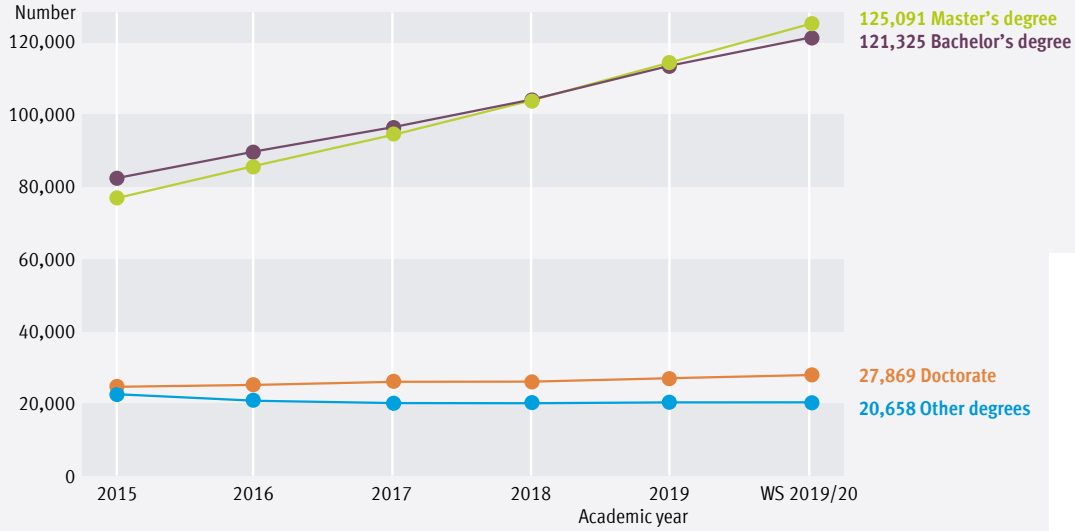
> “ The number of international graduates increases by 10% in a year.

Interest in master's degrees has grown particularly strongly, surging by 62% in five years. This is significantly higher than for bachelor's degrees, as the number of international students hoping to graduate with a bachelor's degree has risen by 46%. Around 27,900 international students are studying for a doctorate. This represents an increase of 11% over 2015. The lower growth rates in doctoral studies can be explained by the limited number of available doctoral positions, the admission requirements for doctoral studies and strong international competition for particularly well-qualified applicants. However, it should not be overlooked that the share of international students in doctoral studies is higher than that of international students in bachelor's and master's programmes.

In the winter semester 2019/20, out of all international students in Germany intending to graduate, 42% were studying for a master's degree, 41% for a bachelor's degree and 10% for a doctorate. 7% planned to complete their studies with a state examination or other type of degree. At universities, the dominance of the master's degree is even more apparent, where 47% of students were enrolled on master's programmes and 31% on bachelor's programmes. 13% aim to achieve a doctorate. At the universities of applied sciences, the situation is reversed: 33% are working towards a master's degree and 65% towards a bachelor's degree. While 46% of all international students hoping to achieve a bachelor's degree are studying at universities of applied sciences, this is only true for 22% of those working towards a master's degree. The ratios for German students are similar. 49% of bachelor's and 29% of master's degree students are enrolled at universities of applied science.

International students' strong interest in master's degrees is also reflected in the fact that one fifth (21%) of all those enrolled in a master's programme with the intention of obtaining a degree are international students. This figure is 22% at universities and 17% at universities of applied sciences. The share of international doctoral students is even higher, at 25%. By contrast, international students enrolled in a bachelor's programme with the intention

B2.1 International students intending to graduate, by type of degree, since 2015



Source: Federal Statistical Office, student statistics

Footnote

1 The number of graduates in the 2019 examination year is calculated from the number of graduates in the 2018/19 winter semester and the 2019 summer semester.

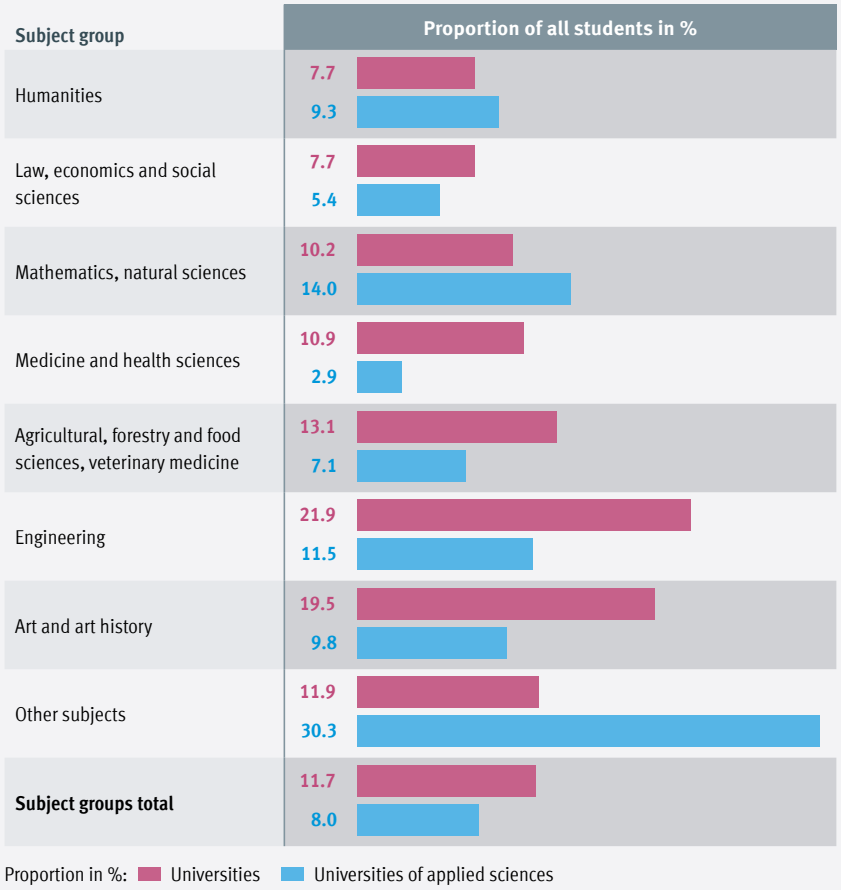
of obtaining a degree account for only 7% (universities: 7%, universities of applied sciences: 6%).

The majority of international students are working towards a degree in engineering (43%) and law, economics and social sciences (24%). This applies both to universities and to universities of applied sciences. These are also the key subject groups for German students, although the ratio is reversed. In their case, law, economics and social sciences are at the top with 39%, followed by engineering with 25%.

Along with the number of international students intending to graduate, the number of international graduates has also risen continuously, growing by 79% to around 48,200 between 2009 and 2019. The growth rate of graduates thus exceeds the increase in the number of international students intending to graduate. The number of international graduates rose particularly strongly, by 10%, from 2018 to 2019. In 2019, 73% of international graduates completed their degree courses at a university and 27% at a university of applied sciences. As a share of all graduates, this represents an increase from 7% in 2014 to 9% for international graduates. At universities, this proportion is 11% and 7% at universities of applied sciences.

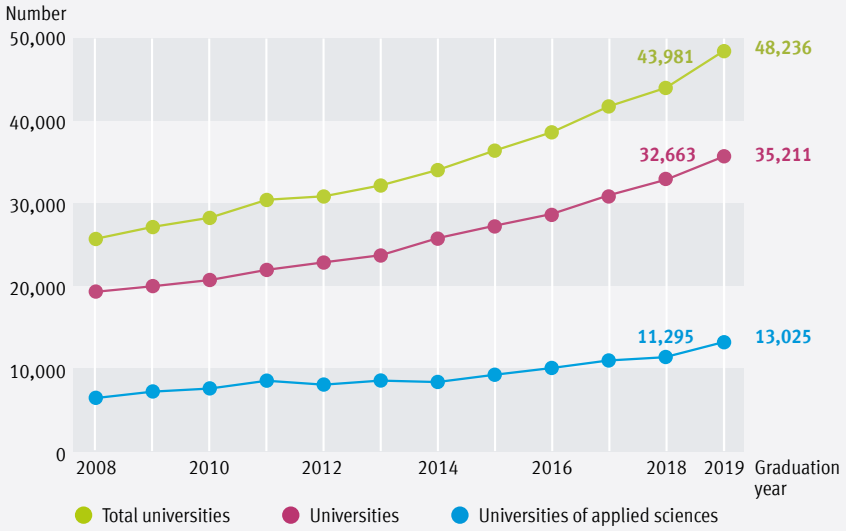
More than half of international graduates achieved a master's degree in 2019 (56%), over a quarter (28%) a bachelor's degree and more than a tenth received doctorates (11%). 6% completed their studies with a state examination or other type of degree. Among all holders of master's degrees, 17% – an above-average proportion – are international graduates. Only international graduates who have completed a doctorate make up a larger share, at around 19%. Among bachelor's graduates, this figure is approximately 5%. As with international students, engineering (38%) and law, economics and social sciences (28%) also dominate among graduates.

B2.2 International students intending to graduate as a proportion of all students, by type of university and subject group, winter semester 2019/20



Sources: Federal Statistical Office, student statistics; DZHW calculations

B2.3 International graduates, by type of university, since 2008[1]



Source: Federal Statistical Office, graduation statistics

2.2 Regions and countries of origin

Most international students seeking a degree in Germany come from the Asia and Pacific region. They make up 32% of all international students. Students from North Africa and Middle East come second with 20%, followed by Western Europe (16%), Central and South Eastern Europe (11%), and Eastern Europe and Central Asia (8%). Sub-Saharan Africa and Latin America account for 6% and 5% respectively of international students intending to achieve a degree, and North America 2%.

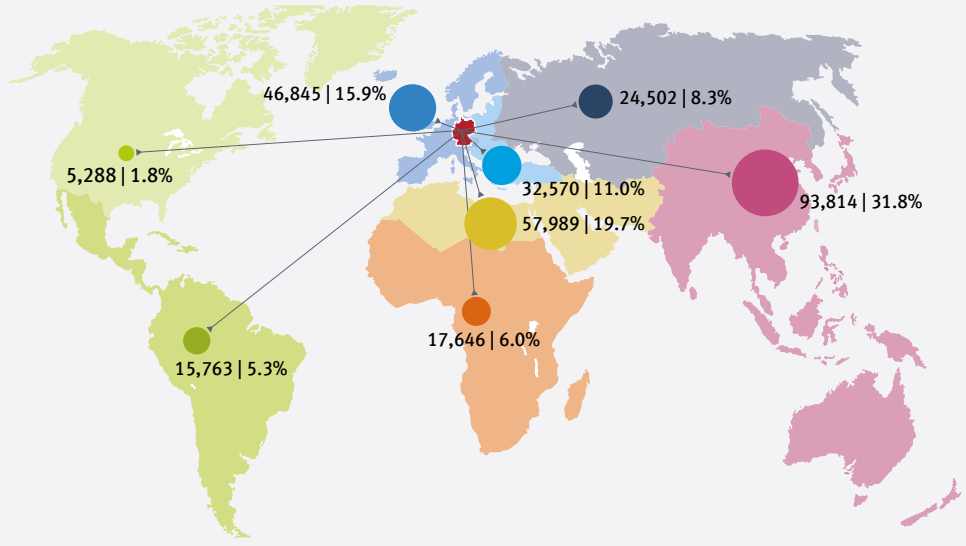
Depending on their region of origin, international students prefer different types of degrees. Roughly half of students from European regions, North Africa and Middle East, and Sub-Saharan Africa study for a bachelor's degree and around a third for a master's degree. This ratio is reversed for American regions of origin and Asia and Pacific, where around half of students intend to graduate with a master's degree and only a third with a bachelor's degree. A relatively high proportion of doctoral students (13%) are from North America.

> "Around a quarter of international students intending to graduate come from China, India and Syria.

Since 2015, three regions in particular have seen above-average growth in their student numbers: North Africa and Middle East (+106%), Asia and Pacific (+58%), and North America (+52%). A below-average increase in student numbers can be observed for Central and South Eastern Europe (+9%), while Eastern Europe and Central Asia shows a slight decline (–1%). The declining or only slightly increasing student numbers from Eastern, Central and South Eastern European countries are due to the demographic changes in some of these countries rather than to the diminishing interest in Germany as a study location. In those countries, population figures in the age cohorts relevant to university study have dropped significantly. This trend has meant that Central and South Eastern Europe, and Eastern Europe and Central Asia have seen particularly marked reductions over the past five years. While in 2015, together they still accounted for 26% of all students intending to graduate, this figure has now fallen to just 19%.

These changes also have an impact on the distribution of international students across individual subject groups. While the proportion of international students in engineering is increasing, the percentage of those studying law, economics and social sciences is decreasing. This shift can partly be explained by the strong preferences of students from the Asia-Pacific region and North Africa and Middle East for engineering courses (more than half of the students in these regions choose to study engineering), while students from European regions are mainly interested in law, economics and social sciences. About one third each choose to study subjects in this subject group.

B2.4 International students intending to graduate, by region of origin, in winter semester 2019/20



Total international students intending to graduate at German universities 294,943 (including 526 students who cannot be allocated to a region of origin)

Number and % of all international students intending to graduate at German universities

Sources: Federal Statistical Office, student statistics; DZHW calculations

Footnote

1 Only countries with at least 100 international students intending to graduate in winter semester 2019/20 (increase) or 2017 academic year (decrease).

The countries of origin for most international students with the intention of obtaining a degree are the three Asian countries of China, India and Syria. China has been at the top of the ranking by a clear margin since the early 2000s. With 38,900 students, 13% of graduate students come from China. Their number has increased by 20% since 2017. The number of Syrian (+233%) and Indian students (+64%) has grown even more dramatically. These countries of origin are followed in the ranking by Austria and Russia, which were in fourth and third places five years ago. The number of Austrian students has risen by 14% since 2017, while the number of Russian students has decreased by 7%. Other major countries of origin are Iran, Turkey, Cameroon, Italy and Ukraine.

It is not only among Syrian students, forced to leave their home country due to the civil war that has been going on for years, that strong, above-average increases have been recorded in recent years. Other countries of origin such as Nigeria (+137%), Sri Lanka (+97%), Albania (+75%), Egypt (+73%), Ghana (+71%), Taiwan (+66%), Algeria (+61%) and Afghanistan (+61%) have all risen substantially in the last three years. By contrast, there has been a significant decrease in student numbers over the same period for the UAE (–79%), Oman (–39%), Gabon (–30%), Slovakia (–24%), Moldavia (–23%) and Poland (–20%).[1]

Although the specific reasons for changes in student numbers vary from country to country, some wider regional trends are also apparent. Chief of these is that the number of internationally mobile students from North Africa and Middle East, and Asia and Pacific is increasing, while numbers from European regions (and eastern European regions in particular) are growing less strongly or even stagnating or declining. In addition to political, humanitarian, economic and demographic issues in these countries of origin, varying levels of development of higher education and academic systems in both the countries of origin and the host countries also influence international mobility.

B2.5 International students intending to graduate, by key countries of origin, in 2015 and winter semester 2019/20

	2015			WS 2019/20	
Country of origin	Number	in %	Country of origin	Number	in %
China	27,992	13.5	China	38,883	13.2
India	11,251	5.4	India	24,430	8.3
Russia	10,695	5.1	Syria	15,811	5.4
Austria	9,709	4.7	Austria	11,889	4.0
Cameroon	6,614	3.2	Russia	9,819	3.3
Bulgaria	6,548	3.2	Iran	9,186	3.1
Ukraine	6,387	3.1	Turkey	8,401	2.8
Iran	5,798	2.8	Cameroon	7,603	2.6
Turkey	5,792	2.8	Italy	7,121	2.4
France	5,289	2.5	Ukraine	6,514	2.2
Italy	5,084	2.4	Tunisia	6,398	2.2
Poland	5,037	2.4	Bulgaria	5,904	2.0
Morocco	4,596	2.2	Pakistan	5,902	2.0
South Korea	3,982	1.9	Morocco	5,755	2.0
Indonesia	3,569	1.7	Vietnam	5,603	1.9
Luxembourg	3,532	1.7	Egypt	5,381	1.8
Spain	3,452	1.7	South Korea	5,334	1.8
Pakistan	3,278	1.6	France	5,300	1.8
Vietnam	3,132	1.5	Indonesia	5,114	1.7
Greece	3,124	1.5	Luxembourg	4,651	1.6

Sources: Federal Statistical Office, student statistics; DZHW calculations

B2.6 Countries of origin of international students with the largest increases and decreases of international students intending to graduate, in 2017 – WS 2019/20[1]

Country of origin	Change 2017–WS 2019/20 in %
Syria	+233
Nigeria	+137
Sri Lanka	+97
Albania	+75
Egypt	+73
Ghana	+71
Taiwan	+66
India	+64
Algeria	+61
Afghanistan	+61
Tanzania	–8
Estonia	–12
Sweden	–16
Latvia	–18
Poland	–20
Moldavia	–23
Slovakia	–24
Gabon	–30
Oman	–39
UAE	–79

Sources: Federal Statistical Office, student statistics; DZHW calculations

2.3 Applicants

Around half of all international students in Germany are enrolled at universities that are members of uni-assist. Therefore, it is possible to calculate data on international applicants at these universities. There was a significant drop of around 10% in the number of applicants in the 2020 academic year due to the Covid-19 pandemic.[1] Compared to the previous year, the number of applicants fell by 68% to the level of 2012. As in 2019, most applicants were from India (15%), followed by China (8%), Syria and Iran (5% each). In the previous year, Syria was still the second most important country of origin for international applicants with 9%. In 16 of the 20 key countries of origin, the number of applicants has decreased compared to the previous year, with decreases ranging from 1% (Russia) to 44% (Syria). That said, the decline in Syrian applicants is not surprising as there had already been a 23% decline previous year, before the Covid-19 pandemic began. A large proportion of the Syrians who fled to Germany in 2015 and 2016 and were interested in studying seem to have arrived in the German higher education system, which is why the number of applicants from Syria is now steadily decreasing.

Compared to the previous year, the group of the 20 key countries of origin is unchanged, only the ranking of individual countries has changed slightly. Just four of the 20 most important countries of origin saw an increase in the number of applicants compared to 2019; these include China (+0.1%), the USA (+2%), Turkey (+11%) and Bangladesh (+25%). It is also noticeable that within the 20 key countries, significant declines can mainly be seen in countries from the Africa and Middle East region; in addition to the already mentioned Syria, these are, for example, Nigeria (–16%), Morocco (–18%), Cameroon (–19%), Ghana (–24%) and Tunisia (–26%). Beyond that, Pakistan (–34%) and Vietnam (–26%) also record a particularly strong decrease in the number of applicants.

There are clear differences between the key countries of origin of applicants in terms of success rates in the formal application process through uni-assist. Only applications that meet all formal criteria are forwarded to the respective university by uni-assist for the final decision on student admission. This final decision is then primarily based on academic grades. Among the 20 key countries of origin in the 2020 academic year, the percentage of applications forwarded by uni-assist ranges from about 77% for applicants from Ghana to about 92% for applicants from Vietnam.

The key reasons for uni-assist rejecting an application are: incomplete documents (29%), insufficient German language proficiency (21%), falling below a specified minimum grade (11%) and exceeding deadlines (11%). Depending on the country of origin, however, the significance of the reasons for rejection varies somewhat. For example, incomplete documents are more likely than average to lead to rejection of applications from Nigeria. Applicants

What is uni-assist?

uni-assist is a registered association, which all state universities in Germany can join. Currently, 158 universities make use of uni-assist's services. The core task of uni-assist is to evaluate international certificates. On behalf of its member universities, uni-assist checks whether the certificates submitted are equivalent to German school-leaving certificates or university degrees and are sufficient to qualify students to study in Germany. If the outcome of the check is positive, uni-assist forwards the application electronically to the respective universities.

B2.7 Key countries of origin of international applicants via uni-assist, in 2019 and 2020, with change from 2019 to 2020[1]

Country of origin	Proportion in %		Comparison 2019 vs 2020 in %
	2019	2020	
India	14.4	15.2	–5.0
China	6.9	7.6	0.1
Syria	8.5	5.2	–44.3
Iran	4.6	4.8	–5.8
Turkey	3.8	4.7	10.8
Nigeria	4.4	4.1	–15.5
Bangladesh	2.6	3.6	24.6
Pakistan	4.9	3.6	–33.9
Russia	2.6	2.9	–0.6
Egypt	2.6	2.7	–6.7
Cameroon	2.7	2.4	–18.7
Morocco	2.5	2.3	–18.1
Indonesia	1.7	1.8	–7.4
US	1.6	1.8	1.8
Tunesia	2.0	1.7	–25.9
South Korea	1.4	1.5	–4.4
Ukraine	1.6	1.5	–17.2
Vietnam	1.7	1.4	–26.4
Ghana	1.4	1.2	–24.3
Columbia	1.1	1.1	–7.3
All countries	**100**	**100**	**–9.9**

Sources: uni-assist; DAAD calculations

Footnotes

1 An academic year includes the summer semester and the following winter semester. Accordingly, the 2020 academic year includes applications for the 2020 summer semester and the 2020/21 winter semester.

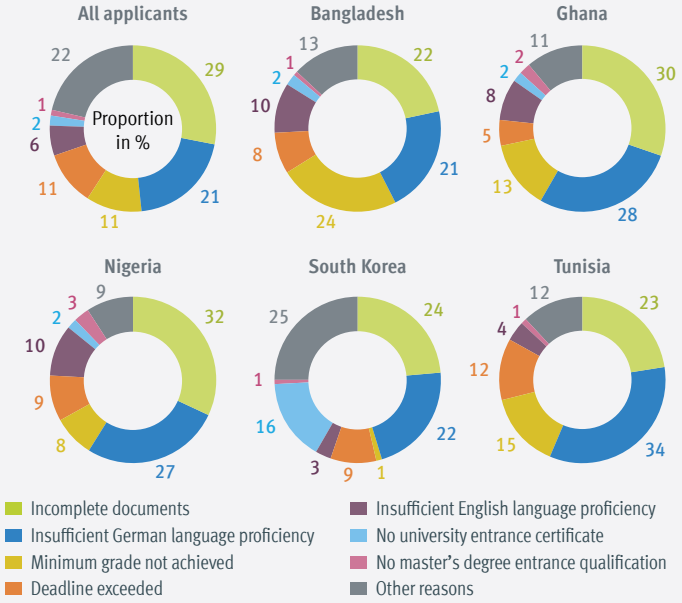
2 Deviations from 100% are due to rounding.

B2.8 Forwarding rate of international applications via uni-assist, by selected countries of origin, in 2020[1]

Country of origin	Forwarding rate in %
Vietnam	92
Bangladesh	91
Russia	89
Ukraine	88
Tunisia	88
Indonesia	87
China	87
Turkey	87
Syria	86
Iran (Islamic Republic)	86
India	86
Nepal	85
Morocco	84
Pakistan	84
South Korea	81
Egypt	81
Cameroon	80
Nigeria	79
Jordan	77
Ghana	77

Sources: uni-assist; DAAD calculations

B2.9 Key formal reasons for rejection of international applications via uni-assist, total and by selected countries of origin, in 2020[1, 2]

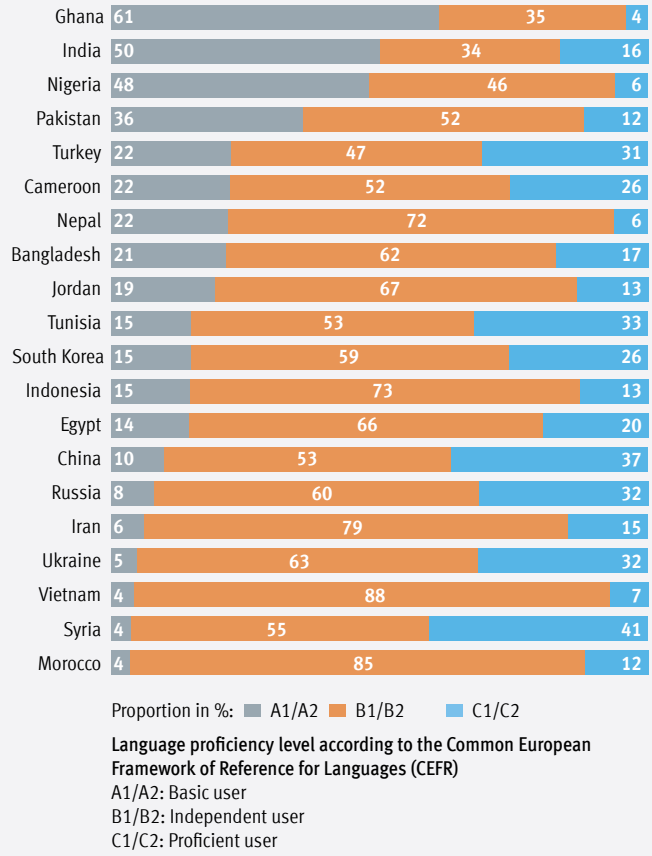


Sources: uni-assist; DAAD calculations

from Tunisia, Ghana and Nigeria are rejected at above-average levels due to inadequate German language skills. Other above-average rates of rejection concern failing to reach a specified minimum grade in the case of applicants from Bangladesh and Tunisia, and inadequate English language proficiency for applicants from Bangladesh and Nigeria. Moreover, common reasons for rejection among key countries of origin include lacking a university entrance certificate, which particularly affects applicants from South Korea (16%), the US (11%) and Egypt (5%), and lacking a master's degree entrance qualification in the case of Cameroon (5%).

There are also clear differences between the 20 key countries of origin concerning the German language skills evaluated in the uni-assist application process. In the 2020 academic year, the highest proportion of applicants who are proficient German language users (C1/C2), according to the Common European Framework of Reference for Languages (CEFR), are from Syria (41%), China (37%) and Tunisia (33%). High percentages of applicants at an intermediate language skill level (B1/B2) come from Vietnam (88%), Morocco (85%) and Iran (79%). Finally, the highest share of applicants with only a basic command of German (A1/A2) is to be found among applicants from Ghana (61%).

B2.10 German language skills of international applicants via uni-assist, by selected countries of origin, in 2020[1, 2]



Language proficiency level according to the Common European Framework of Reference for Languages (CEFR)
A1/A2: Basic user
B1/B2: Independent user
C1/C2: Proficient user

Sources: uni-assist; DAAD calculations

2.4 Refugee students at German universities and on preparatory courses

Around 8,600 individuals received funding through the DAAD's Integra programme (Integrating Refugees in Degree Programmes) in 2019. The main goal of the programme continues to be funding refugees who are interested in studying and also possess the necessary knowledge, skills and ability. However, the focus of the programme has now been widened to encompass student support measures for all international students. The support on offer has always concentrated on the first two years after a student joins the programme, focusing on courses and measures to support preparations for higher education. This has now been supplemented with a raft of measures to support entry into the German employment market. These include compact formats that teach and expand key skills, as well as application coaching and events involving representatives from business.

> "The proportion of Turkish participants has quadrupled over 2018 levels, and they now represent the second largest group of Integra participants.

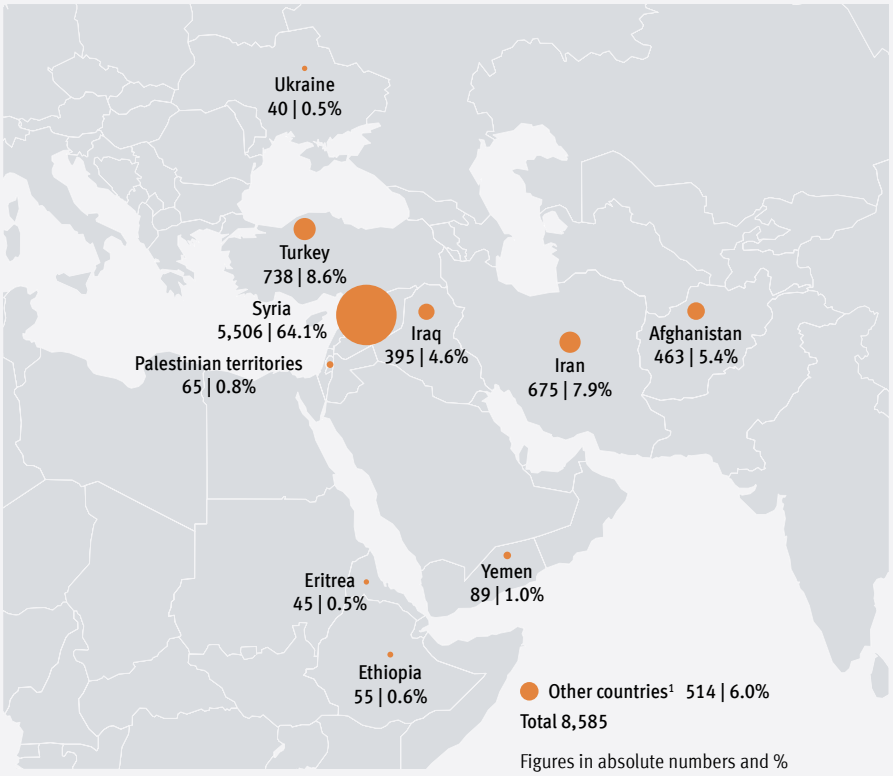
Even though widening the target population, expanding the courses offered and including compact employment preparation schemes is likely to lead to an increase in the proportion of students not from refugee backgrounds, in 2019 as in previous years, the single largest group (by a clear margin) of course participants were from Syria (64%). It should be emphasised that the percentage of Turkish refugees has quadrupled compared to 2018 and they now represent the second largest group among Integra participants (9%).

The share of female participants on Integra courses continues to increase. In 2016, roughly only a fifth of participants were female but, by 2019, this had risen to about a third. Among the factors contributing to this trend were a range of measures developed by universities specifically for women, such as language and learning cafés, tailored support services and childcare provision.

The average age of Integra participants also continued to rise, at 28.6 years in 2019. However, there are substantial differences between the various countries of origin. In 2019, the average age for participants from Syria was 27.4, while that of Iranian (31.6) and Turkish (33.0) participants was, by contrast, significantly higher. These pronounced differences in age are certainly due in large part to their heterogeneous educational background. For example, over half of Turkish participants have already graduated, compared to only 15% of Syrian participants.

In 2019, seven out of every ten courses were wholly or at least in part dedicated to providing language teaching and linguistic support to their participants. Considering levels of demand and the needs of the target population, the proportion of courses pitched at high levels of language skills continues to rise substantially. Now almost half (48%) of participants on language courses took courses at levels C1-DSH.[2]

B2.11 Integra programme participants by key countries of origin, in 2019



Source: DAAD

Footnotes

1 Incl. stateless refugees and refugees of unknown origin.

2 According to the Common European Framework of Reference for Languages (CEFR), levels A1/A2 relate to elementary language usage, B1/B2 to independent language usage and C1/DSH to proficient usage (DSH = German Higher Education Access Language Examination).

In 2019, almost 40,000 people received counselling under Integra funding. The main issues addressed here were choosing courses of study, insufficient language skills, funding living costs during preparatory courses or while at university, as well as gaps in participants' knowledge of the German higher education system. Family problems, health and mental health problems and intercultural misunderstandings played a minor role.

More than half of the project leaders receiving Integra funding confirm that the funding has been a boost to innovation. They say it has allowed them to offer courses and support in more targeted ways, to create new types of courses that meet specific needs, to develop new ways of teaching and to update registration and acceptance procedures.

> "More than half of the project leaders receiving Integra funding confirm that the funding has been a boost to innovation.

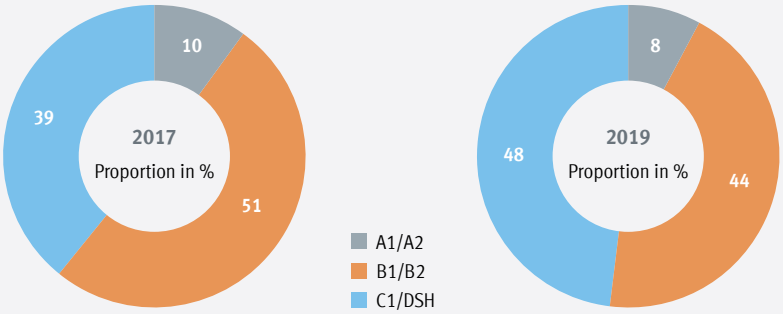
Almost half of universities and preparatory colleges receiving Integra funding continued their efforts to boost the development and implementation of digitalisation, which had already been underway before the Covid-19 pandemic. These included digital tests and assessments such as Test-DaF, TestAS and onSet, as well as employing digital teaching and learning platforms, teaching videos and tutorials, and mobile apps.

B2.12 Average age of Integra programme participants, by key countries of origin, in 2019

Country of origin	Average age in years
Syria	27.4
Turkey	33.0
Iran	31.6
Afghanistan	28.9
Iraq	28.9
Total	**28.6**

Source: DAAD

B2.13 Refugees on Integra programme language courses, by language course level, in 2017 and 2019[2]



Source: DAAD

B2.14 Major topics of advice for prospective students from refugee backgrounds in Germany, in 2019

Topic	2019
Insufficient language skills	83
Choice of study programme/study orientation/organising studies	79
Insufficient knowledge of the university system	79
Financing while studying	78
Insufficient subject knowledge	72
Recognition of qualifications	69
Student support measures and opportunities	65
Financing travel costs to university location	62
Financing during preparatory courses	60
Housing market/accommodation situation	59
Questions on the German labour market	56
Residence and asylum issues	51
Job centre requirements	51
Alternatives to studying	50
Dealing with day-to-day life	46
Family problems	45
Missing documents	45
Psychological problems	45
Intercultural problems/misunderstandings	40
Integration outside university	39

Proportion in %

Source: DAAD

3.1 Mobility trends and subject groups

In the 2019/20 winter semester, around 25,000 international students were enrolled for a temporary visit at a German university. This represented around 8% of all international students. However, this figure underestimates the total number of students who came to Germany for a temporary visit in the 2019 academic year. It does not include those students who enrol for a visit of this kind in the summer semester and stay at the university for one semester only, which is the case for many visiting and exchange students. Their number for the 2019 summer semester was around 11,900, which means that the total number of temporary visiting and exchange students enrolled at German universities during the 2019 academic year was around 36,900. That is roughly 1,600 (4%) lower than the 2018 academic year.

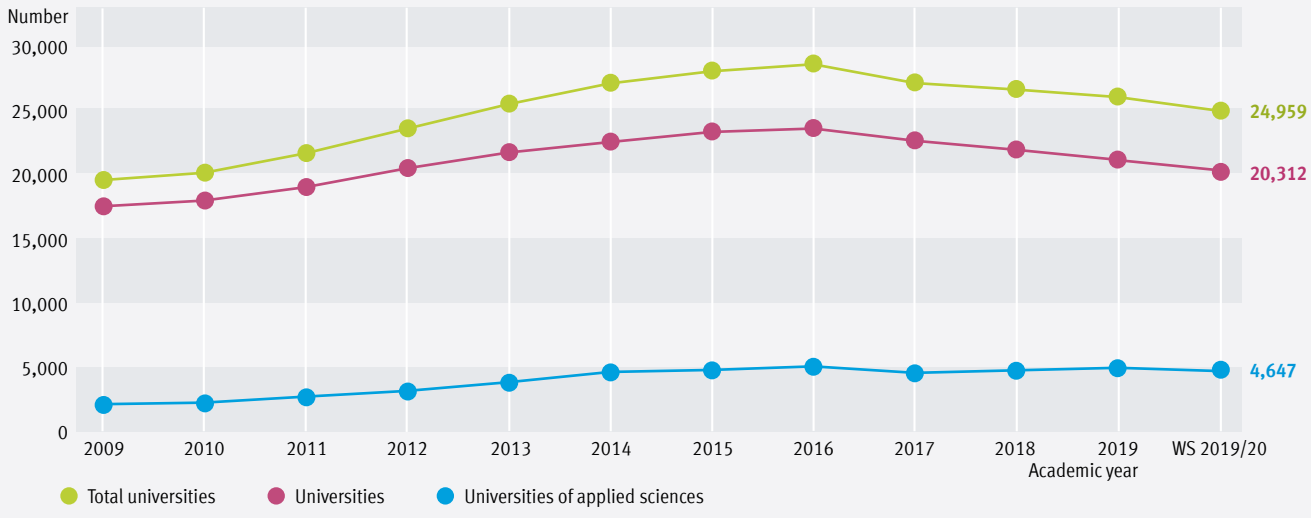
The decline in the number of international students completing a temporary study-related visit to Germany has been going on for some time. Consequently, the figure for the 2019/20 winter semester was 13% lower than the 2015/16 winter semester, down by 3,600 students. The reasons for this trend are complex as the number of such visits is not only influenced by individual motives for mobility but also by existing exchange programmes, cooperation relationships and associated study programmes. Concrete support from universities and other institutions also figures prominently. In addition, demographic and economic developments in the respective countries of origin play an important role.

> “In the humanities, one fifth of international students were enrolled for a temporary study-related visit.

The vast majority of international students (81%) enrolled for their temporary visit at a university, while 19% completed their temporary visit abroad at a university of applied sciences.

International students who come to a German university for a shorter period of study enrolled in law, economics and social sciences (31%) and the humanities (29%) with notable frequency. By contrast, the share for engineering is 18%. 6% study mathematics and natural sciences, 3% medicine and health sciences, 3% art and art history, and 1% agricultural, forestry and food sciences. 8% are enrolled in other subjects. Compared to international students seeking a degree in Germany, the high proportion of temporary visits in the humanities and the low proportion in engineering are particularly striking. The same percentages apply to German students. Temporary study visits are evidently associated with different academic goals for international students to a full course of study. The high percentages of temporary enrolments in the humanities can be explained in particular by the strong interest of international students of German in a visit to a German university. Temporary enrolments are a way for these students to improve their German language skills, conduct research into specific subject areas and experience the culture and language of a German-speaking country. For international engineering students, on the other hand, a temporary visit of this kind to a German university seems to be of much less interest than a full course of study.

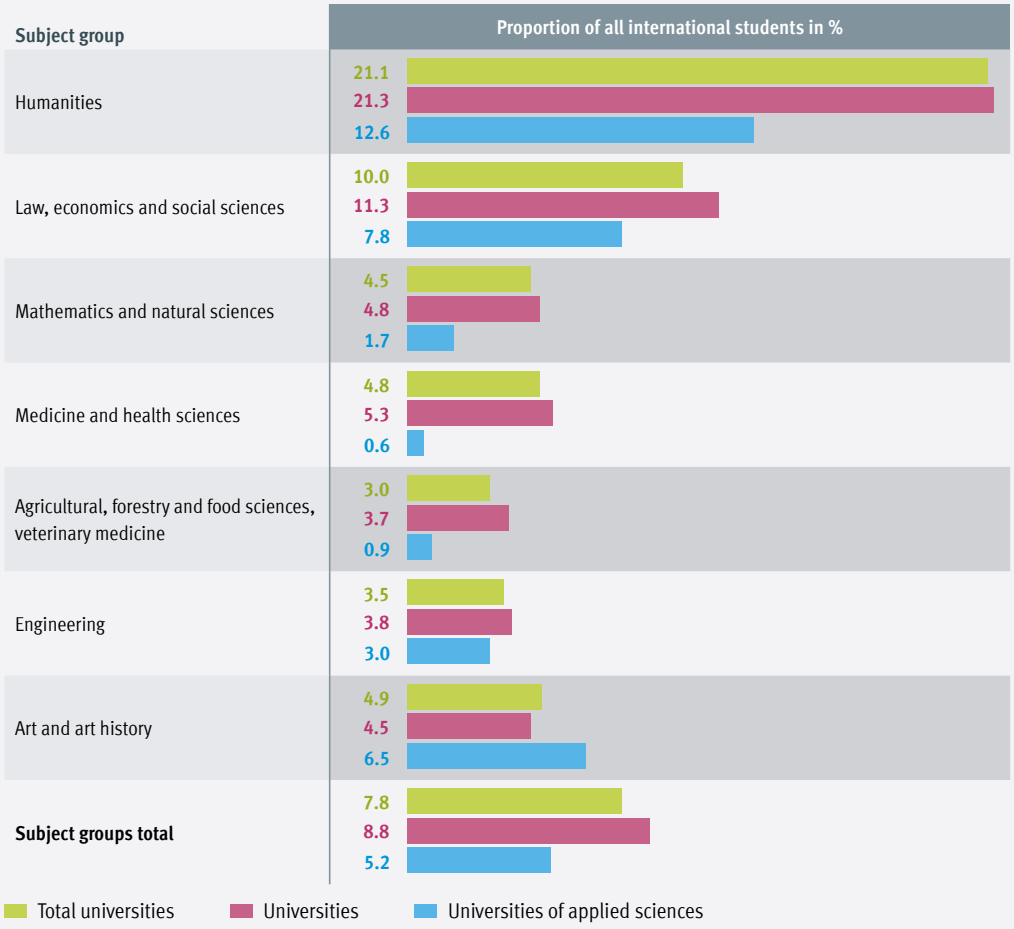
B3.1 International students on temporary study-related visits, by type of university, since 2009



Source: Federal Statistical Office, student statistics

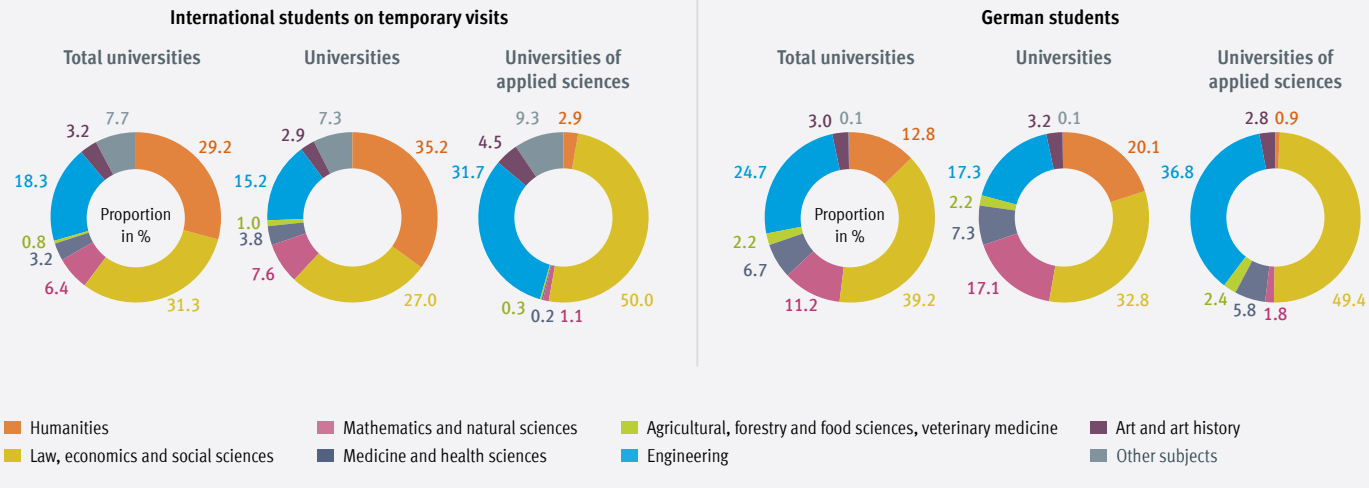
In line with this situation, students on temporary visits represent the highest share of all international students in the humanities. At 21%, one in five international students in this subject group is at the university for a limited period. A comparatively high proportion (10%) is also found in law, economics and social sciences. This figure is below average in all other subject groups, and lowest in engineering and agricultural, forestry and food sciences, at 4% and 3% respectively. Of the international students who cannot be assigned to any subject group, the overwhelming majority of 86% enrolled on a temporary study visit. These are clearly special or short programmes set up primarily for international exchange and visiting students.

B3.2 International students on temporary study-related visits as a proportion of all international students, by subject group and type of university, winter semester 2019/20



Sources: Federal Statistical Office, student statistics; DZHW calculations

B3.3 International students on temporary study-related visits and German students, by subject group and type of university, winter semester 2019/20



Sources: Federal Statistical Office, student statistics; DZHW calculations

3.2 Regions and countries of origin

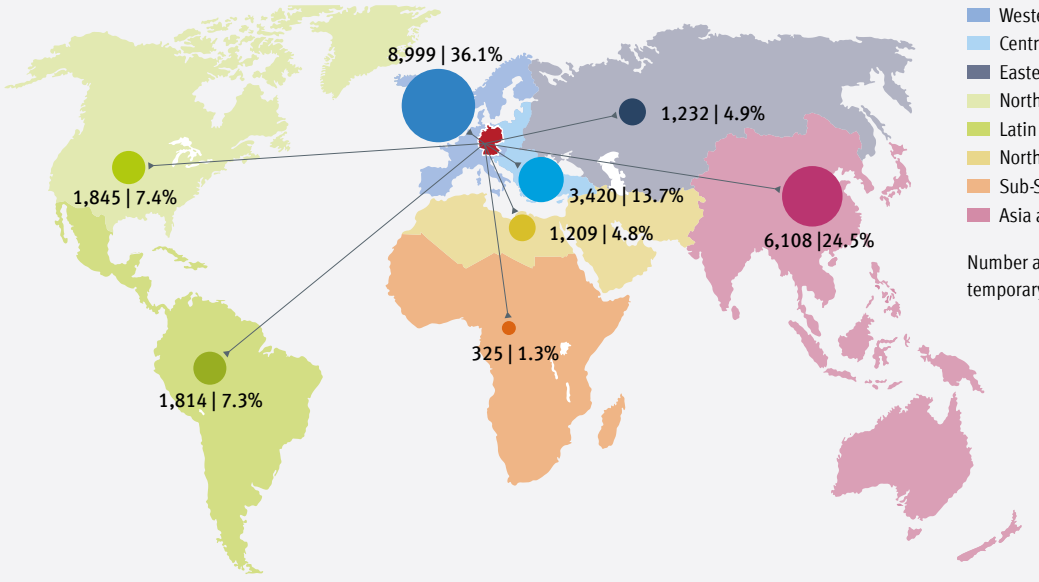
Most international students on temporary study visits to German universities in the 2019/20 winter semester came from Western European countries. They account for a total of 36% of these students. 14% of temporary visits are made by students from Central and South Eastern Europe.
This means that half of internationally mobile students not seeking a degree in Germany come from one of these two European regions. Asian and Pacific countries are also highly significant in this regard. Taken together, they represent 25% of temporary mobility. By comparison, the other regions of origin play a much smaller role: 7% each of international students on temporary study visits in Germany come from North and Latin America, 5% from North Africa and Middle East, and from Eastern Europe and Central Asia, and 1% from Sub-Saharan Africa.

> “Almost half of students on a temporary study-related visit come from a non-European country.

Non-European regions of origin thus also account for a significant proportion – around 48% – of international visiting and exchange students. German universities are evidently attractive for short study visits, even for students from countries outside Europe. Compared to international students seeking a German university degree, it is striking that a higher share of visiting and exchange students come from Western, Central and South Eastern European countries, and North America. At the same time, they are significantly less likely to come from countries in the regions of North Africa and Middle East as well as Sub-Saharan Africa. On the one hand, these findings confirm the success of European higher education policy in developing the European Higher Education Area and the Erasmus programme. The associated funding and support structures make a significant contribution to the fact that, not only has there been a strong increase in levels of interest in temporary mobility in Europe, but that students can also take advantage of it. However, the regional origin of the students concerned also indicates that, without such support and assistance in the form of well-funded programmes, it is more difficult, especially for students from countries with lower average incomes, to undertake a temporary study visit in Germany. Alongside the time-consuming organisational challenges of arranging a visit outside a structural framework, the greatest problem faced by these students is having to pay the costs of living and study without financial support. Their comparatively short visits, lasting only a few months, and often weaker German language skills mean these students do not have the same opportunities to earn sufficient additional income in Germany through gainful employment as their fellow students who complete all their studies in Germany.

As in the case of international students intending to graduate, China tops the ranking of countries of origin. One in ten temporary mobile students is of Chinese origin. This is followed by the Erasmus countries of Italy, Spain and the US with shares of

B3.4 International students on temporary study-related visits, by region of origin, winter semester 2019/20



Number and in % of all international students on temporary study-related visits at German universities

Sources: Federal Statistical Office, student statistics; DZHW calculations

Footnote

1 Only countries with at least 50 international students on temporary visits in winter semester 2019/20 (increase) or 2017 academic year (decrease).

between 9% and 7%. Other major countries of origin are France, South Korea and Turkey. Five years ago, these countries were already among the key countries of origin for international students with temporary study visits in Germany. However, they have seen different rates and levels of change over this period. While more students from China and Italy are coming to German universities on a temporary basis, the number of students from Spain, the US and France has declined.

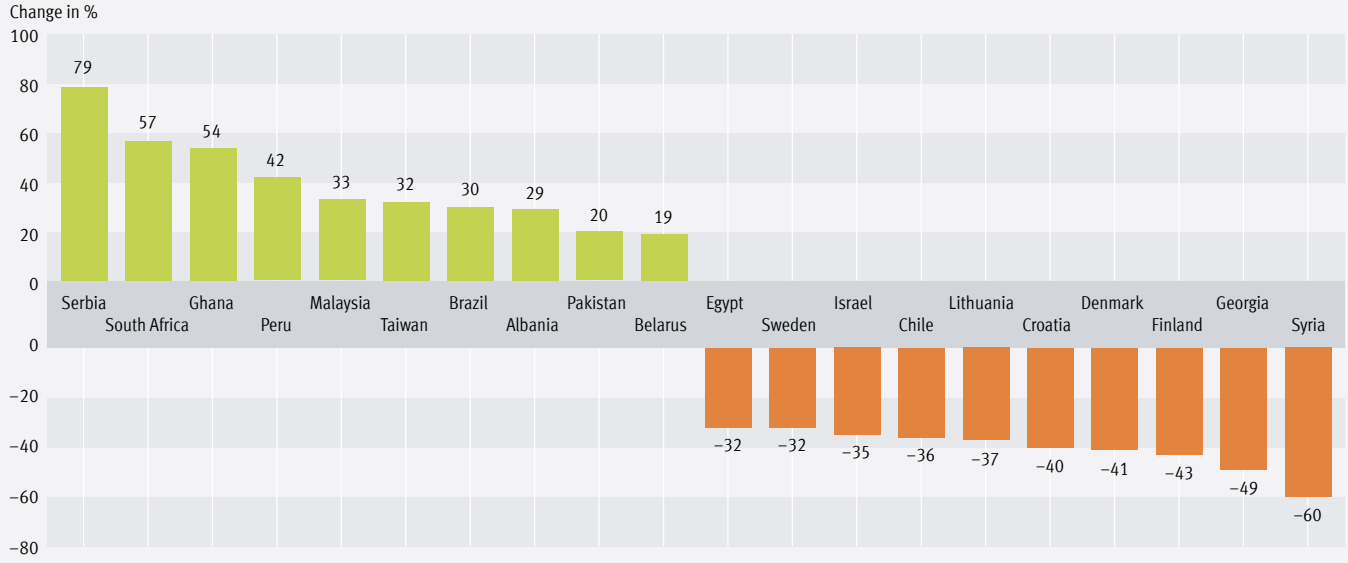
However, since 2017, the most significant changes have occurred in other countries of origin. Particularly significant increases can be seen in the number of students from Serbia (+79%), South Africa (+57%), Ghana (+54%) and Peru (+42%). By contrast, there have been sharper declines in students from Syria (–60%), Georgia (–49%), Finland (–43%), Denmark (–41%) and Croatia (–40%).[1]

B3.5 International students on temporary study-related visits, by key countries of origin, in 2015 and winter semester 2019/20

	2015			WS 2019/20	
Country of origin	Number	in %	Country of origin	Number	in %
Spain	2,294	8.2	China	2,470	9.9
China	2,267	8.1	Italy	2,298	9.2
Italy	2,085	7.4	Spain	1,982	7.9
France	2,016	7.2	US	1,643	6.6
Brazil	1,983	7.1	France	1,581	6.3
US	1,928	6.9	South Korea	1,127	4.5
Poland	1,128	4.0	Turkey	1,072	4.3
Turkey	993	3.5	Japan	747	3.0
South Korea	856	3.1	Russia	688	2.8
Russia	839	3.0	Brazil	683	2.7
United Kingdom	689	2.5	Poland	654	2.6
Japan	615	2.2	United Kingdom	566	2.3
Czech Republic	583	2.1	Taiwan	561	2.2
Mexico	565	2.0	Mexico	454	1.8
Hungary	431	1.5	India	438	1.8
Switzerland	414	1.5	Jordan	381	1.5
India	404	1.4	Switzerland	366	1.5
Taiwan	373	1.3	Portugal	288	1.2
Belgium	369	1.3	Czech Republic	287	1.1
Finland	343	1.2	Netherlands	286	1.1

Sources: Federal Statistical Office, student statistics; DZHW calculations

B3.6 Countries of origin with the largest increases and decreases of international students on temporary study-related visits, in 2017–winter semester 2019/20[1]



Sources: Federal Statistical Office, student statistics; DZHW calculations

3.3 Erasmus visits

In 2019, around 33,100 Erasmus students from other countries undertook a study-related visit to Germany. Their numbers continue to rise and are approaching the high point they reached in 2016.[1] About 400 (1%) more students came to Germany than in 2018. This change is solely due to increased Erasmus placement visits. In 2019, 11,700 Erasmus students completed visits of this kind at German universities: 2,000 (18%) more students than in 2016. This represents a 7% increase over last year alone, which compensated for the continued decline in study visits. Overall, their number has fallen by 9% to 21,400 since 2016. This means that 65% of all Erasmus students from other countries recently came to Germany to study and 35% for a placement. The percentage of placements has increased steadily over the past ten years. Since 2008, the year in which placements were introduced as part of the Erasmus programme, their share of all Erasmus visits has more than doubled from an initial 15%.

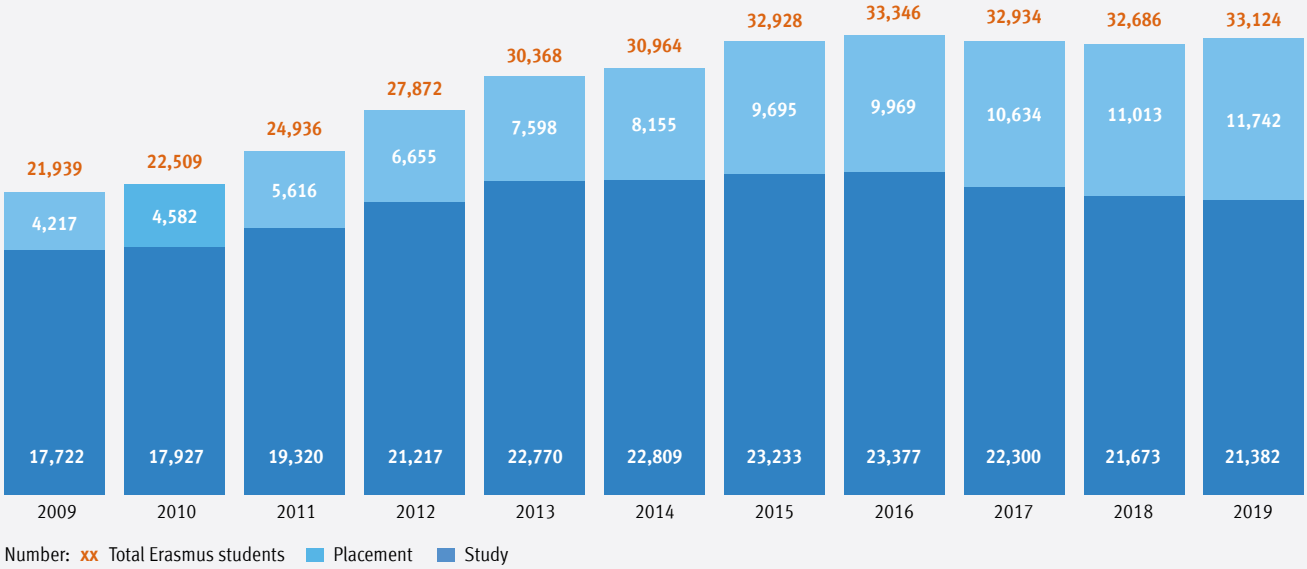
> “Since 2008, the proportion of Erasmus students coming to Germany on a placement has risen from 15% to 35%.

France, Italy and Spain remain the key countries of origin. Together they account for 40% of all Erasmus students in Germany. Other major countries are Turkey, the United Kingdom, Poland, the Netherlands and Austria, which together account for a further 32% of Erasmus participants. Rates and levels of change vary from country to another. Numbers of Erasmus students in Germany from Italy, Turkey, the United Kingdom and the Netherlands are increasing steadily. By contrast, the numbers of students from Poland and Austria have been decreasing in recent years. France and Spain are characterised by relatively stable figures with minor variations.

Levels of interest in an Erasmus placement also vary from country to country. Most people on Erasmus placements come from France, Austria, the United Kingdom and Turkey. By contrast, study visits to German universities are mainly undertaken by participants from Italy, France, Spain and Turkey.

There is a particular emphasis on three subject groups among Erasmus students in Germany. The arts and humanities account for 26% of all participants. 21% of participants are in economics, administration and law, and 17% in engineering, manufacturing and construction. A comparison of all international students at German universities shows that Erasmus students are most strongly over-represented in the fields of the arts and humanities as well as social sciences, journalism and information science. On the other hand, under-representation is particularly noticeable in the fields of engineering, manufacturing and construction, natural sciences, mathematics and statistics, and information and communication technologies. The differences in subject preferences are partly a result of the regions of origin of Erasmus students compared to all international students. It can be seen that Asian students, who account for a high proportion of international students in

B3.7 Erasmus students from other countries, by type of visit to Germany, since 2009[1]



Source: DAAD, Erasmus statistics

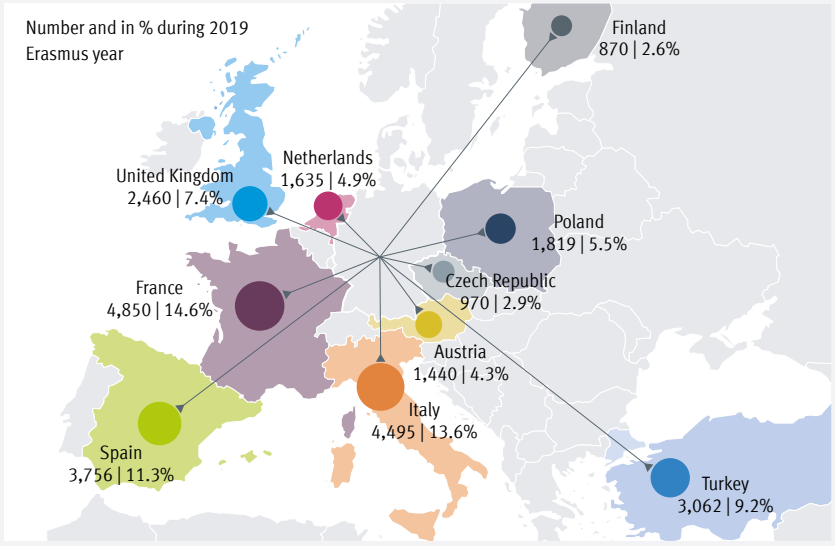
> “ 40% of all Erasmus students in Germany come from France, Italy and Spain.

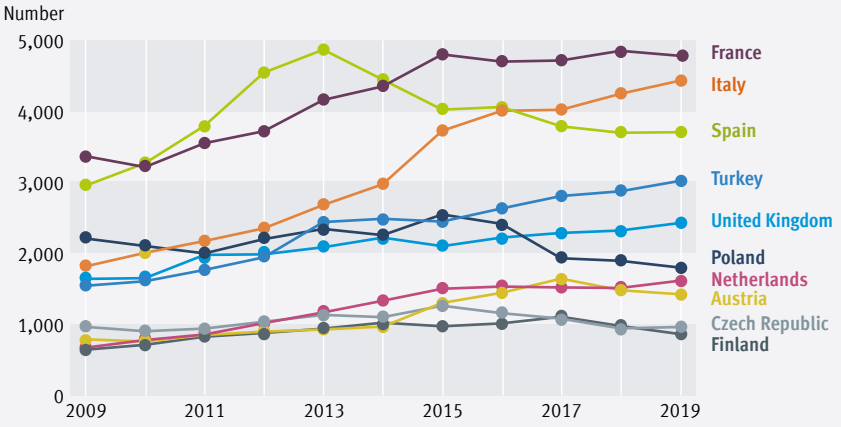
Germany, particularly prefer engineering subjects. By contrast, Erasmus students come exclusively from European countries, which are characterised by an above-average interest in the humanities and social sciences and in economics and law among internationally mobile students seeking a university degree in Germany.

Footnote

1 Erasmus statistics to 2014: the academic year begins in the winter semester and ends in the summer semester of the following year. 2014 = WS 2013/14 + SS 2014.
New Erasmus statistics from 2015: the academic year begins on 1 June of the preceding year and ends on 31 May of the following year. 2019 = 01/06/2018 to 31/05/2020.

B3.8 Erasmus students from other countries in Germany, by key countries of origin, since 2009





Sources: DAAD, Erasmus statistics; DZHW calculations

B3.9 Erasmus students from other countries in Germany and all international students in Germany, by subject group, in 2019

Proportion of all international students in Germany in %	Subject group	Proportion of all Erasmus students in Germany in %
1.1	Education	2.3
15.6	Arts and humanities	25.5
19.2	Social sciences, journalism and information	10.6
4.3	Business, administration and law	20.5
10.5	Natural sciences, mathematics and statistics	7.1
10.4	Information and communication technologies	3.4
29.3	Engineering, manufacturing and construction	17.2
1.7	Agriculture, forestry, fisheries and veterinary	1.5
5.9	Health and welfare	8.9
2.0	Services	3.0

Sources: DAAD, Erasmus statistics; Federal Statistical Office, student statistics; DZHW calculations

SPOTLIGHT

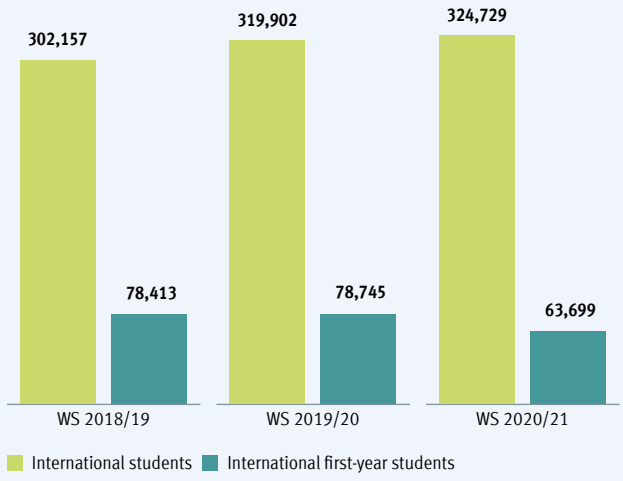
The development of the number of international students in Germany in 2020

The number of international students in Germany rose from around 319,900 in the 2019/20 winter semester to 324,700 in the 2020/21 winter semester, an increase of 2%. However, this increase does not correspond to an upwards trend in the numbers of international first-year students. In the 2019/20 winter semester, there were still 78,700 such students, but their number had fallen to 63,700 a year later, a decline of 19%.

> “The number of international students grew overall in the 2020 summer semester and the 2020/21 winter semester, though there was a sharp decline in international first-year students.

A similar disparity was already apparent in the 2020 summer semester, the first semester that fell during the Covid-19 pandemic and associated global restrictions on mobility. While 293,300 international students were enrolled at German universities in the 2019 summer semester, their numbers increased by 5,000 (2%) for the 2020 summer semester, reaching 298,100. However, there were pronounced differences between universities and universities of applied sciences. While students enrolled at universities fell by 1% during this period, their number rose by 8% at universities of applied sciences. By contrast, there was a significant decrease in the number of international first-year students, both for universities and universities of applied sciences, dropping 41% between the 2019 and 2020 summer semesters at universities and 6% at universities of applied sciences. The total number of international first-year students fell by a total of 29% to around 22,800 in the 2020 summer semester (from 32,200 the previous year).

BS1 International students and first-year students in Germany, since WS 2018/19



Source: Federal Statistical Office, student statistics

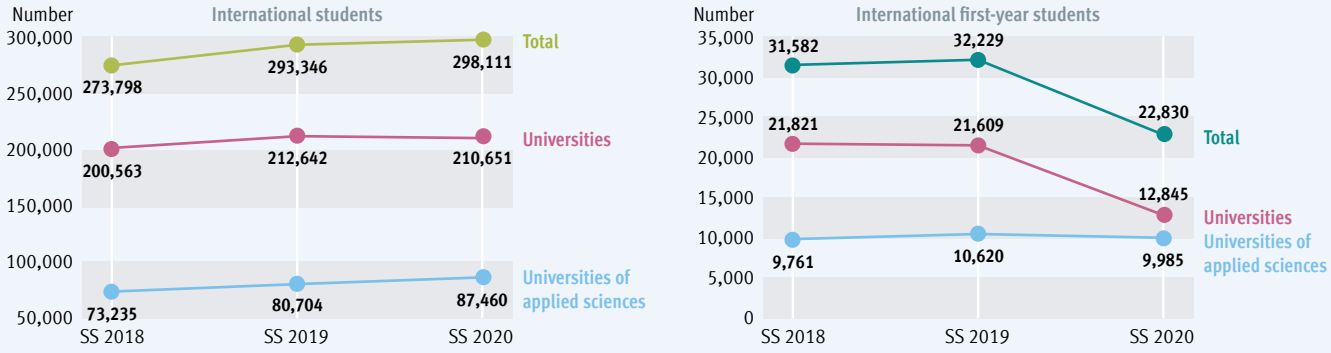
Data basis

Official statistics for the 2020 summer semester and 2020/21 winter semester were used to calculate the changes in numbers of international students in Germany in 2020. Robust and definitive data are available for both periods. However, at the time of writing, the latest data for the 2020/21 winter semester, which the Federal Statistical Office published in August 2021, were not yet available in a fully differentiated or itemised form.[1]

To undertake the most detailed analysis possible, this Spotlight includes student data on the summer semesters for the first time. Previous reporting in *Wissenschaft weltoffen* had chiefly drawn on figures for the winter semesters. Summer and winter semester data were only referred to in order to present numbers for first-year students and graduates.[2] When interpreting the student numbers here, it should be noted that data for the summer and winter semesters cannot be directly related to each other. Due to differences in the number of first-year students and those who have left the university, there are systematic differences in the student figures between the summer and winter semesters. The figures for winter semesters are higher for all student groups than for summer semesters. Hereinafter the data for summer and winter semesters will therefore not be compared with each other, but only within their respective semester groups.

The only explanation for the astonishing rise in total international student numbers for the summer and winter semesters, despite the Covid-19 pandemic and a simultaneous decline in numbers of international first-year students, is that more international students in later semesters stayed at university. We can therefore assume that the number of graduates in the 2020 summer semester and 2020/21 winter semester is lower than for the preceding semesters. Major reasons for this could be that the switch to new digital forms of learning in many study programmes caused students to delay graduating from university (Lörz et al 2020) or that students were delaying graduation to avoid having to find employment under pandemic conditions, which have had a considerable economic impact. Furthermore,

BS2 International students and first-year students, by type of university, since the 2018 summer semester



Source: Federal Statistical Office, student statistics

BS3 International students and first-year students, by intention to graduate and type of university, since the 2018 summer semester

Source: Federal Statistical Office, student statistics

a higher proportion of international students may have progressed immediately from their bachelor's degrees to master's programmes than in previous years. This may have been to avoid difficulties in carrying out placements or study visits abroad, or to circumvent current uncertainties in finding the desired employment.

Apparently, the number of students remaining at German universities was so high that it compensated for the not inconsiderable decline in the numbers of international first-year students. Evidently, international students who were already at German universities in the 2019/20 winter semester were able to come to terms with studying under the conditions of a pandemic.

SPOTLIGHT

The development of the number of international students in Germany in 2020

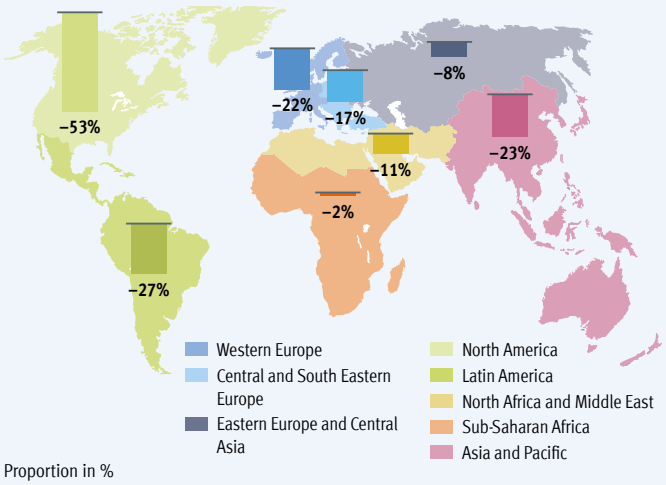
However, the situation was more complicated for international first-year students who were not yet in Germany by the 2020 summer semester or the 2020/21 winter semester. Firstly, the pandemic caused severe restrictions in the issuing of visas and the ability to enter Germany. Secondly, starting a study programme in a hitherto unknown country under pandemic conditions represented a significant challenge. A considerable number of internationally mobile students who were interested in studying in Germany will therefore have postponed starting their study programmes to a later date when conditions at universities return to normal.[3]

Another option that was offerered to international first-year students in many host countries during the 2020/21 winter semester was to start their study programmes digitally from their home countries. In Germany, too, almost three quarters of universities offered international students a service of this kind in the 2020 summer semester and the 2020/21 winter semester (see DAAD 2021, p. 17). Quite a few international first-year students took advantage of this opportunity. The number of students who reported a semester address in a foreign country rose by 25% from 3,900 in the 2019 summer semester to 4,900 in the 2020 summer semester, representing an increase from 12% to 21% of all international first-year students from one summer semester to the next (albeit among greatly reduced numbers of first-year students). Another consequence of the Covid-19 pandemic appears to be a significant increase in the numbers of international students who are enrolled on distance learning courses, some of which replace regular university courses. They continue to represent a small minority of students but between the 2019 and the 2020 summer semesters, their numbers rose by over half from 1,200 to 1,900 (+58%).

> “ 21% of international first-year students commenced their study programmes digitally from abroad in the 2020 summer semester.

Our analysis of trends in numbers of international students during the summer semesters shows that the decline in international first-year students is primarily a consequence of a fall in the number of international students on temporary study visits. During the 2020 summer semester, 5% more international students were enrolled at a German university with the goal of completing a degree. However, during the same period, the number of visiting and exchange students fell by 38%. This trend can be observed at all types of university, although there was a particularly sharp decline in visiting and exchange students at universities, falling by 41%. This shift is particularly marked among first-year students as the

BS4 Change in numbers of international first-year students from winter semester 2019/20 to winter semester 2020/21, by region of origin



Proportion in %

Source: Federal Statistical Office, student statistics; DZHW calculations

Footnotes

1 It was therefore not yet possible to draw conclusions about international students on temporary study visits, the type of university or the types of degree that students were working towards.

2 In previous editions of *Wissenschaft weltoffen,* the number of first-year students was reported in relation to an academic year (one academic year = summer semester + following winter semester) and the number of graduates in relation to a graduation year (graduation year = winter semester + following summer semester).

3 Many universities in Germany provided similar services to their international first-year students. According to a DAAD survey of international offices in the 2020/21 winter semester, 68% of universities offered their international first-year students the chance to postpone starting their study programmes until the 2021 summer semester (see DAAD 2021, p. 17).

4 Only countries with at least 100 international first-year students in the 2020/21 winter semester (increase) or the 2019/20 winter semester (decrease).

5 Only countries with at least 50 international first-year students on temporary study-related visits in summer semester 2020 (increase) or in summer semester 2019 (decrease).

BS5 Countries of origin of international first-year students with the largest percentage increases and decreases, winter semester 2019/20 to winter semester 2020/21[4]

Countries of origin	Change WS 2019/ 20–WS 2020/21
Lebanon	+35
Uzbekistan	+33
Afghanistan	+31
Belarus	+26
Yemen	+22
Austria	+22
Iran	+16
Sri Lanka	+15
Bangladesh	+15
Ghana	+14
Slovenia	–46
Taiwan	–49
Malaysia	–49
Norway	–49
Sweden	–50
Argentina	–52
US	–54
South Korea	–56
Australia	–65
Japan	–69

Source: Federal Statistical Office, student statistics; DZHW calculations

BS6 Countries of origin of international students on temporary study visits with the greatest percentage increase or decrease, from summer semester 2019 to summer semester 2020[5]

Countries of origin	Change SS 2019–SS 2020
Iraq	+26
Belarus	–45
Netherlands	–46
Hungary	–48
Slovakia	–48
Bulgaria	–49
Thailand	–52
Ukraine	–52
South Korea	–53
Finland	–53
Czech Republic	–53
Croatia	–54
Australia	–56
Greece	–57
Japan	–59
Israel	–61
Canada	–62
Syria	–63
US	–64
Singapore	–70

Source: Federal Statistical Office, student statistics; DZHW calculations

majority of international students on temporary study visits only spend one semester at host universities. Between the 2019 and 2020 summer semesters, the number of international first-year students not intending to graduate in Germany fell by 54% overall (60% at universities and 33% at universities of applied sciences). However, among first-year students intending to graduate the decline was less sharp, falling only 10% from the previous summer semester. While their numbers fell by 20% at universities, they actually rose by 4% at universities of applied sciences.

The extent of changes in the numbers of international first-year students varied substantially between the various regions and countries of origin during the Covid-19 pandemic. For instance, in the 2020/21 winter semester, there were particularly noticeable decreases in the enrolment of first-year students from North America (–53%), Latin America (–27%), Asia and Pacific (–23%), and Western Europe (–22%) at German universities, compared to last year. At the level of individual countries, the steepest declines in numbers of first-year students were recorded for Japan (–69%), Australia (–65%), South Korea (–56%) and the US (–54%).[4] However, some countries of origin recorded increases, including Lebanon (+35%), Uzbekistan (+33%), Afghanistan (+31%) and Belarus (+26%).

A rather different picture emerges if we consider only students on temporary study visits at a country-specific level. The data available prevent widening the scope of this analysis beyond the 2020 summer semester but the sharpest declines from the previous summer semester were observed among visiting and exchange students from Singapore (–70%), the US (–64%), Syria (–63%), Canada (–62%) and Israel (–61%). The only increase in students on temporary study visits was for students from Iraq (26%).[5]

With regard to the 2020 summer semester in Germany (the first under pandemic conditions), there was a particularly steep decline in temporary international mobility (*credit mobility*), while degree-related international mobility (*degree mobility*) has not (yet) seen any significant losses. The initial reaction of many universities in Germany and abroad to the pandemic was to cancel their exchange programmes, either wholly or in part (see DAAD/DZWH 2020b, p. 36; DAAD 2021, p. 9). It can therefore be assumed that this gap between temporary mobility and degree-related international mobility will have continued in the 2020/21 winter semester (a view supported by the continued increase in the overall numbers of international students against the simultaneous decline in first-year students).

1.1 Mobility trends and major host countries

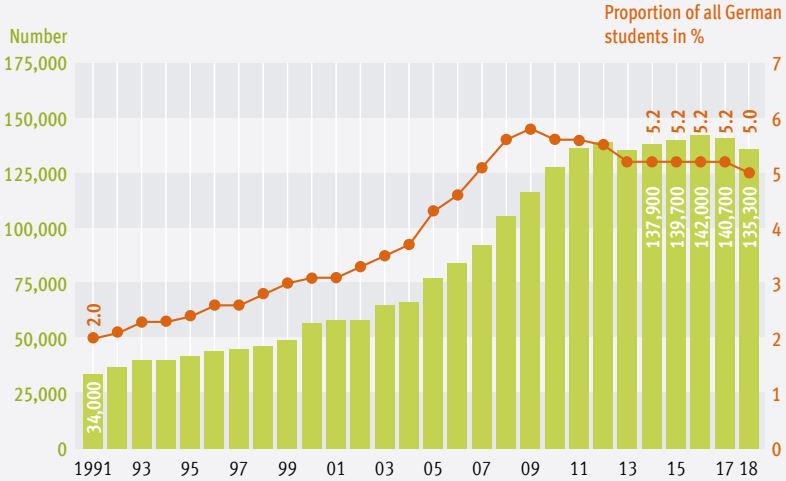
In 2018, around 135,000 Germans were studying abroad. Thus, their number had decreased slightly compared to 2015, when the figure was approximately 140,000. However, if we broaden the time frame, the number of German students abroad has almost quadrupled since 1991 and more than doubled since 2000. A closer look at this trend reveals that in the period between 2002 and 2010 – that is, when the new, tiered study system was being introduced – above-average growth rates of 10% and more were achieved per year. During this period, students abroad increased from 3.3% to 5.6% as a share of all German students. This suggests that the current comparability of degrees has provided a clear impetus for mobility. The option created by the new degree system of completing a bachelor's degree at home and a master's degree abroad was and still is particularly popular among students. However, since the introduction of the new types of degrees has been completed, this expansion in mobility can be regarded as having largely come to an end. Since then, the absolute number of German students abroad has hardly risen, and their proportion of all German students has even fallen slightly since 2011 mainly due to strong increases in the number of German students studying at German universities up to 2015. In 2018 this figure was 5.0%.

The majority of the German students abroad (approx. 90%) recorded by official statistics also aim to obtain a degree abroad (see info box on the data basis used for this analysis). The motives for this form of mobility differ fundamentally from the motives for temporary study-related mobility (see Chapter C2). While degree-related international mobility is usually motivated by a student's desire to improve their chances of realising their life and career plans by obtaining a foreign university degree, temporary study-related mobility is more dominated by the desire to broaden one's horizon, improve foreign language skills and further one's career, for example. The motives for mobility also strongly influence the choice of the respective host country or host institution. Just under three quarters of all German students abroad are in Western European countries (71%). The regions of Central and South Eastern Europe (11%), North America, and Asia and Pacific (8% each) follow a substantial way behind. The other regions of the world are of very little significance in the degree-related

Data basis

The data on German students abroad listed on pp. 64–67 are primarily provided by the Federal Statistical Office. The Federal Statistical Office conducts an annual survey of the institutions responsible for education statistics in around 40 key host countries of German students. The Federal Statistical Office also supplements the survey with UNESCO and Eurostat data on other host countries, in which at least 125 German students were registered in the current year. These students are predominantly, but not exclusively, students working towards a degree abroad. For some countries, Erasmus students and other students with temporary study periods are also included in the data (see also the corresponding footnotes to the figures). However, only some countries are able to quantify the exact number or share of these temporarily mobile students. In these countries, however, the figure is below 10% in each case. The data presented here are therefore interpreted primarily as data on degree-related student mobility.

C1.1 German students abroad, since 1991[1]



Source: Federal Statistical Office, "Deutsche Studierende im Ausland", country-specific reporting periods; DAAD calculations

Footnotes

1 From 2010: numbers of German students in Germany include results of the Doctoral Survey, a separate survey of doctoral students in Germany conducted by the Federal Statistical Office, which, unlike the matriculation statistics, also includes doctoral students who are not enrolled.

2 In addition to the host countries covered by the Federal Statistical Office, this includes those countries in which, according to UNESCO student statistics, more than ten German students were enrolled in 2017 or 2018.

3 2018: discontinuity in the time series compared to the previous year.

4 Figure from 2017 instead of 2018, as data for 2018 are not yet available.

5 Figures have been taken from the official statistics of the Higher Education Statistics Agency (HESA) as the report of the Federal Statistical Office does not contain more recent figures on first-year students.

6 2015: data from 2013 as no data from 2015 are available.

7 2015: data from 2014 as no data from 2015 are available.

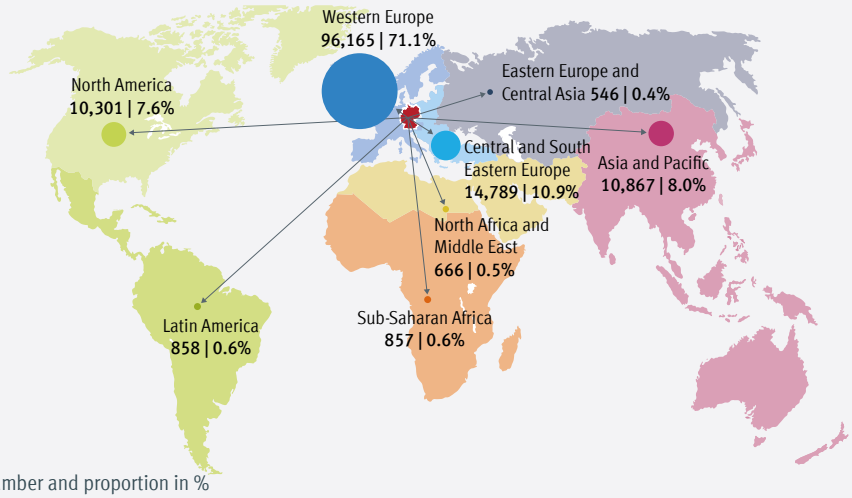
international mobility of German students, with each accounting for less than 1%.

The four most popular host countries are still Austria, the Netherlands, the United Kingdom and Switzerland. While the number of German students in the Netherlands, the United Kingdom (–1% each) and especially Switzerland (–22%) has dropped since 2015, the trend in Austria during the same period has been positive (+5%). Among the major host countries with a particularly significant increase in German students between 2015 and 2016 are, apart from Portugal (+22%), mainly Central and Eastern European countries, such as Poland (+12%), Romania (+57%), Bulgaria (+94%) and especially Turkey (+445%). Except for Poland, however, these increases are mainly due to the change in how student statistics are captured in these countries.

The same applies in a similar way to the key host countries, with a conspicuous decline in the number of German students. The decreases for Sweden (–61%), Canada (–39%) and France (–34%) are mainly of a statistical nature. By contrast, host countries with uninterrupted data collection have shown much more moderate rates of change.

Looking at the number of first-year students in the top ten host countries that provide such figures, the trend is the opposite for the United Kingdom and the Netherlands. While the United Kingdom recorded a fall of 1% in the number of first-year students between 2015 and 2018, the number of first-year students in the Netherlands rose by 8%. These may already be signs of a shift in student mobility from Germany, perhaps primarily due to the sharp rise in tuition fees and the cost of living in the United Kingdom. It can be assumed that this trend will increase further over the coming years, also as a result of the additional impact of the Brexit referendum in 2016.

C1.2 German students abroad, by host region, in 2018[2]



Number and proportion in %

Sources: Federal Statistical Office, "Deutsche Studierende im Ausland"/UNESCO student statistics; country-specific reporting periods; DAAD calculations

C1.3 German students abroad, by key host countries, in 2015 and 2018, plus development over time from 2015 to 2018

Host country	Number 2015	Number 2018	Development 2015–2018 in %
Austria	27,563	29,053	5
Netherlands	21,530	21,314	–1
United Kingdom	15,410	15,300	–1
Switzerland[3]	14,647	11,459	–22
US	10,145	9,191	–9
China	7,536	8,079	7
France	6,406	4,231	–34
Turkey	706	3,850	445
Hungary	3,106	3,428	10
Denmark[4]	3,554	3,018	–15
Spain	2,497	1,878	–25
Sweden[4]	4,620	1,781	–61
Portugal	1,422	1,737	22
Italy[4]	1,412	1,626	15
Romania	898	1,409	57
Greece[4]	1,637	1,402	–14
Bulgaria	722	1,402	94
Poland	1,090	1,221	12
Australia	1,147	1,166	2
Canada[4]	1,827	1,110	–39

Source: Federal Statistical Office, "Deutsche Studierende im Ausland"; country-specific reporting periods; DAAD calculations

C1.4 German first-year students abroad, by key host countries, in 2015 and 2018, plus development over time from 2015 to 2018

Host country	Number 2015	Number 2018	Development 2015–2018 in %
Austria	7,505	8,228	10
United Kingdom[5]	7,330	7,245	–1
Netherlands	5,899	6,397	8
Switzerland	4,464	3,232	–28
Portugal	1,087	1,405	29
Spain[6]	407	848	108
Turkey[7]	188	820	336
Australia	421	453	8
France	1,704	373	–78
Poland	283	295	4

Source: Federal Statistical Office, "Deutsche Studierende im Ausland"; country-specific reporting periods; DAAD calculations

1.2 Subject groups and types of degree

The majority of German students abroad are enrolled in business, administration and law (24%), as well as in the social sciences, journalism and information studies (21%) as fields of study.[1] These are followed by the humanities and the arts, health and welfare (12% each), the natural sciences, mathematics and statistics, as well as engineering, manufacturing and construction (9% each). Compared to German students at German universities, the social sciences, journalism and information studies are thus clearly over-represented abroad, whereas engineering, manufacturing and construction are noticeably under-represented.

A comparison between the individual host countries shows strong differences in the distribution of subject groups in some cases. Business, administration and law clearly dominate in the two anglophone countries Ireland and Australia as well as in the Netherlands, Portugal and Spain. The high proportion of health and welfare subjects in three Eastern European host countries, Hungary, Poland and the Czech Republic, is also striking. This may be a consequence of the admission restrictions for German medical study programmes, which cause some applicants to look for alternatives abroad. Countries such as Hungary, Poland and the Czech Republic also use the good reputation of their medical education to specifically advertise for international students, in the case of Poland and the Czech Republic with English-language, in the case of Hungary even German-language study programmes. In addition, the structure of medical studies in these countries is very similar to that of German medical studies, and in the Czech Republic and Hungary, these study programmes lead to a state examination like in Germany.

> “Central and Eastern European countries such as Hungary, Romania, Bulgaria, Poland and Lithuania are notable in that more than three quarters of German students are on master’s degree courses.

Just under half of German students abroad (49%) are aiming for a bachelor’s degree there and more than a third (38%) for a master’s degree.[2] A further 12% are doing a doctorate abroad, while other types of degree (including type of degree unknown) account for 1% of students. Compared to German students at German universities, master’s students are thus clearly over-represented abroad, while bachelor’s students are noticeably under-represented.

The distribution of the types of degree in the host countries is also very different in some cases. For example, in the Netherlands, Turkey, Greece, Canada and Japan, well over 50% of German students are studying for bachelor’s degrees. By contrast, in Central and Eastern European countries such as Hungary, Romania, Bulgaria, Poland and Lithuania, more than three quarters of

> “Compared to German students at German universities, the social sciences, journalism and information studies are clearly over-represented abroad, whereas engineering, manufacturing and construction are noticeably under-represented.

German students are on master’s degree courses. English-speaking and Scandinavian host countries such as the United Kingdom, Ireland, Australia, Canada, Denmark, Sweden, Finland and Norway account for a significant proportion of German doctoral students. This also applies to Switzerland, Spain and the Czech Republic.

Footnotes

1 Basis: countries providing data differentiated by subject group to the Federal Statistical Office on German students and doctoral candidates. These countries account for around 86% of German students abroad. With the exception of China, they also include all 20 key host countries for German internationally mobile students.

2 Basis: countries for which data on German students by type of degree are available from the Federal Statistical Office or the OECD. However, these countries account for around 82% of German students abroad and, with the exception of China, also include all 20 key host countries for German students abroad.

3 Since the 2018 issue of “Deutsche Studierende im Ausland”, subject groups have been classified according to ISCED standards and therefore deviate from the German Federal Statistical Office standard classification system.

4 Deviations from 100% are due to rounding.

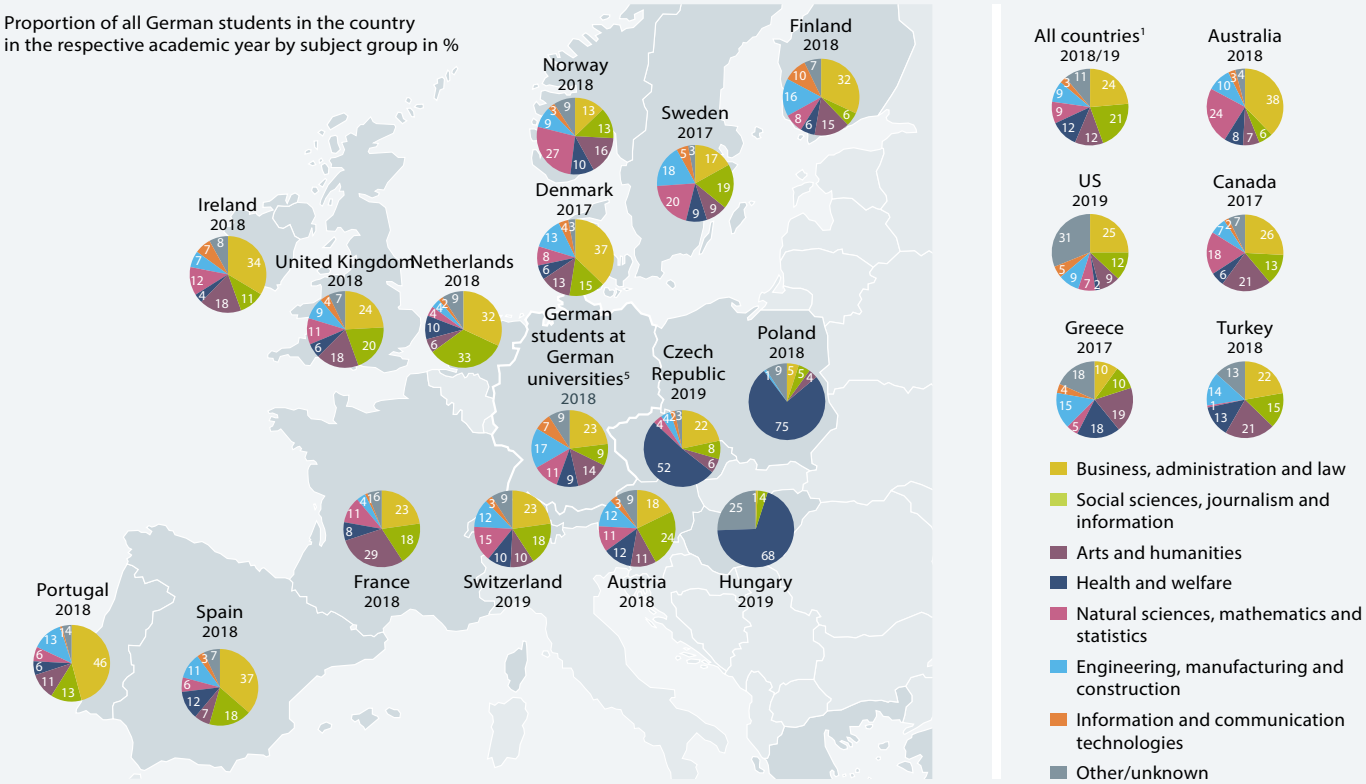
5 The data on German students at German universities refer to the winter semester 2017/18.

6 OECD data as they are more complete, more up-to-date or more accurate than data from the Federal Statistical Office.

7 OECD data as they are not included in the data of the Federal Statistical Office.

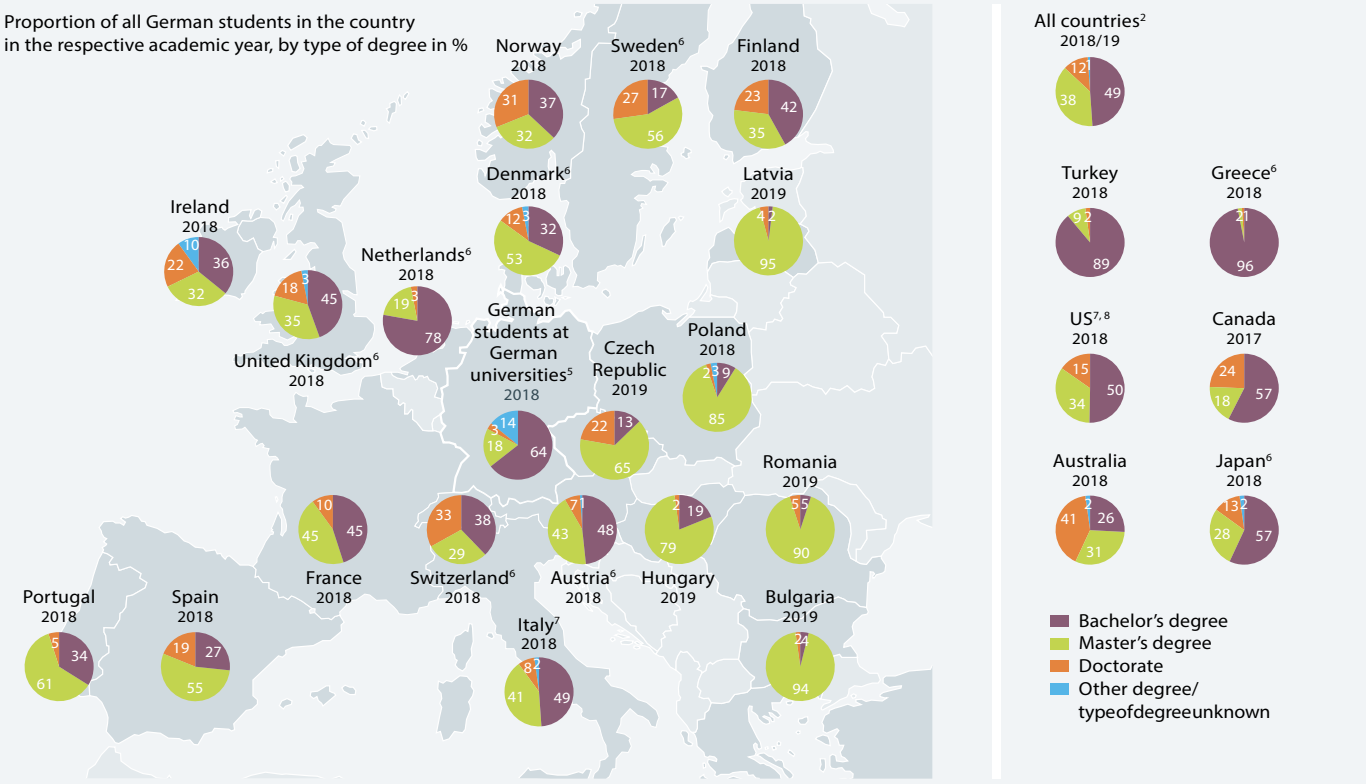
8 Data on doctoral students taken from the database of the Student and Exchange Visitor Information System (SEVIS), as they are not included in the OECD data.

C1.5 German students in selected host countries, by subject group[3, 4]



Source: Federal Statistical Office, "Deutsche Studierende im Ausland", country-specific reporting periods

C1.6 German students in selected host countries, by type of degree[4]



Sources: Federal Statistical Office, "Deutsche Studierende im Ausland"; OECD student statistics; country-specific reporting periods

2.1 Mobility trends

The findings of previous Social Surveys show that, between 1991 and 2000, the proportion of students in later semesters with visits abroad rose sharply (from 20% to 32%) and stabilised at this level until 2006.[1] In 2009 and 2012, the figure was slightly lower at 30% each year, falling further to 28% in 2016. This development can be observed – at different levels in each case – at both universities and universities of applied sciences. In contrast to degree-related international mobility (see p. 64), there was thus no increase in the mobility rate for temporary study-related mobility while the two-cycle study system with bachelor's and master's programmes was being introduced. Instead, there was even a certain decline in temporary student mobility during this period.

> "From 2006 to 2016, the proportion of students with temporary study-related visits abroad fell from 32% to 28%.

Possible reasons for this are the more strongly structured study and examination system introduced as part of the Bologna reforms, as well as the shortening of the standard study periods. From the students' point of view, both aspects may have meant that the newly introduced study programmes offer less scope for study-related visits abroad during the course of study than was previously the case. It will not be possible to know whether this situation has changed in the meantime – because many universities have revised their bachelor's programmes, for example, particularly after they were introduced, and in many

Database

The data situation regarding the temporary study-related mobility of students at German universities must be described as unsatisfactory at present, especially in comparison with other countries. It was not until 2017 that the reformed Higher Education Statistics Act introduced the mandatory survey of study-related visits abroad by students in Germany. This requirement of the new Higher Education Statistics Act still poses major challenges for many universities. The Federal Statistical Office Germany will therefore not be able to publish the first reliable data on the temporary study-related mobility of students at German universities until the end of 2021 at the earliest. It should be noted that these data conform to the definition of the EU mobility benchmark (see also pp. 70/71). As a result, mobility rates on this basis will be significantly lower than the mobility rates previously collected on the basis of survey data. At present, the data from the Social Surveys, which were conducted jointly by the German National Association for Student Affairs and the German Centre for Research on Higher Education and Science Studies (DZHW), represent the most reliable source of data for analysing the development of temporary study-related mobility of students at German universities. No other representative survey of students or graduates allows a representative view of mobility development over a comparable period of time.[4]

C2.1 Proportion of German students in later semesters on study-related visits abroad, by type of university, since 1991[1, 5]

Proportion of all students in later semesters in %

Sources: DSW Social Surveys 1991–2016

cases have also made them more flexible – when new, comparable data on current student mobility are available. However, this is unlikely to occur until the end of 2021 at the earliest, since the latest nationwide representative student survey by the DZHW has just been conducted in the 2021 summer semster.[2]

A closer look at the development of the Social Survey data between 2012 and 2016 reveals that temporary study-related mobility in particular has declined for language and cultural studies and medical studies. In contrast, no striking differences can be observed in the development by type of degree. However, the clear discrepancy between the mobility rates in bachelor's and master's programmes in 2016 points to another reason for the lower overall rate: only master's students will ultimately achieve a mobility rate that is above the level of traditional types of degree, whereas the mobility rate for bachelor's students is significantly lower.[3] The decline in temporary student mobility between 2006 and 2016 is therefore likely to be due not least to the sharp rise in the proportion of bachelor's students at German universities during this period (winter semester 2006/07: 20%, winter semester 2016/17: 64%).

Footnotes

1 The mobility rate of students in later semesters or at the end of their studies makes it possible to assess study-related international mobility over the course of an entire study cycle. It is thus more meaningful than mobility rates in relation to all students. Students in later semesters from 1991 to 1994 are: students from the 8th university semester (university) or 6th university semester (university of applied sciences) (1991: West Germany only); from 1997: students from the 9th to 14th university semester (university) or 7th to 11th university semester (university of applied sciences).

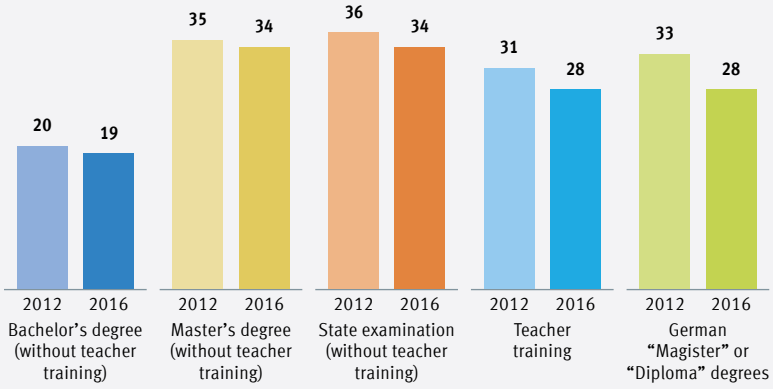
2 The implementation of this integrated student survey, in which the previous social survey will also be integrated, was originally planned for 2020 summer semester, but had to be postponed by one year due to the Covid-19 pandemic.

3 This is not least due to the fact that the mobility of master's students recorded here also includes visits abroad in the bachelor's programmes. This is therefore the cumulative international mobility in the bachelor's and master's programmes.

4 The DAAD/DZHW mobility study, which was carried out every two years between 2007 and 2017, has now been discontinued. In the 2020/21 winter semester, the DAAD started the follow-up survey "Benchmark internationale Hochschule" (BintHo).

5 Incl. Bildungsinlaender.

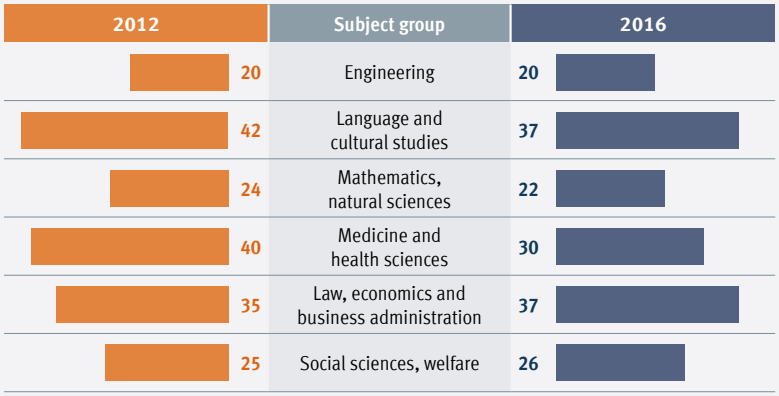
C2.2 Proportion of German students in later semesters on study-related visits abroad, by type of degree, in 2012 and 2016[1, 5]



Proportion of all German students in later semesters in %

Sources: DSW Social Surveys 2012, 2016

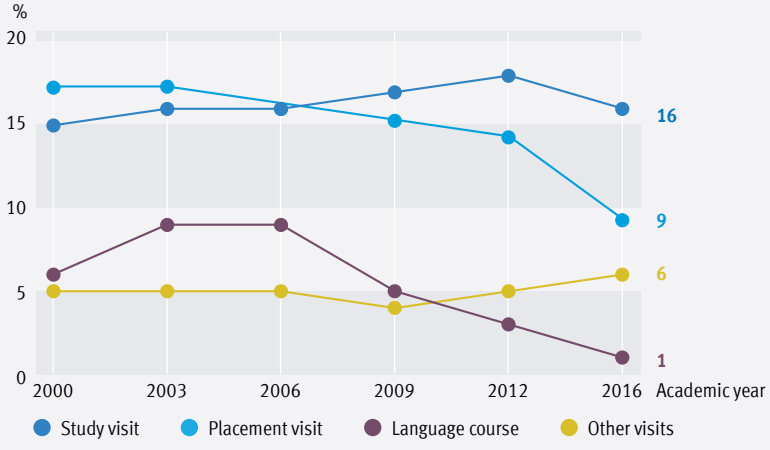
C2.3 Proportion of German students in later semesters on study-related visits abroad, by subject group, in 2012 and 2016[1, 5]



Proportion of all German students in later semesters in %

Sources: DSW Social Surveys 2012, 2016

C2.4 Proportion of German students in later semesters on study-related visits abroad, by type of visit, since 2000



Proportion of all German students in later semesters in %; multiple responses possible

Sources: DSW Social Surveys 2000–2016

2.2 Status of goal achievement

Targets for international mobility exist both at European level and at the level of individual higher education systems. A specific mobility target was set for all EU countries in 2011 in the "Council conclusions on a benchmark for learning mobility". This was adopted one year later in the Bucharest Communiqué for all countries of the European Higher Education Area (EHEA) under the Bologna Process. According to the Communiqué, by 2020 no less than 20% of all graduates in any year at universities in the EU or EHEA countries should have acquired a degree abroad or have gained a certain amount of temporary study-related mobility experience. Temporary study-related mobility is defined as recognised study and placements abroad of at least three months' duration or with at least 15 ECTS. In Germany, the Federal Government and the federal states defined two tiered objectives in the Internationalisation Strategy of the Joint Science Conference of 2013. Under this strategy, by 2020 half of university graduates should have gained study-related experience abroad (50% target) and one third of graduates should have completed a study-related visit abroad of at least three months and/or acquired 15 ECTS points (33% target).

> "The differing definitions of mobility for the current targets result in different levels of mobility and are therefore not directly comparable.

However, German and European target rates are not directly comparable as very different definitions of mobility are used to calculate them. For example, only study and placement periods credited by the home institution are taken into account in the calculation of the European mobility benchmark. This definition means that a certain part of the study-related international mobility (more precisely: non-credited visits and visits of less than three months) is not included when calculating rates of mobility. Moreover, only visits abroad in the current study cycle are taken into account when calculating the European benchmark. This means, for example, that a master's graduate who only spent study-related periods abroad during her bachelor's programmes is classified in the calculation as a master's graduate without experience abroad. The same principle applies to graduates with a successful doctorate.

In contrast, German mobility targets take a broader view of mobility. For example, when extrapolating the German 50% target, the DAAD includes all study-related visits abroad of at least one month in the calculation, regardless of whether they are credited at the home university. Furthermore, experience gained abroad in earlier study cycles is also taken into account, in other words, master's students with study-related international mobility only during their bachelor's programme, for example, are still counted as internationally mobile.

As a result, the differing mobility definitions of the existing targets lead to different levels of mobility rates, which are not comparable in terms of content. This lack of comparability between rates is exacerbated by the fact that different data sources are used

C2.5 European and German mobility targets

European mobility targets of EU and EHEA countries	
"Council conclusions on a benchmark for learning mobility" of the EU (2011) and Bucharest Communiqué of responsible ministers of all EHEA states (2012)	By 2020, at least 20% of all graduates in the EU or the European Higher Education Area should have acquired experience of degree-related or temporary mobility abroad. Study and placement visits of at least three months and/or acquiring 15 ECTS points are considered temporary mobility.
German mobility targets	
Internationalisation strategy of the Joint Science Conference [Gemeinsame Wissenschafts-konferenz] (from 2013)	**Target A:** By 2020, every second university graduate should have gained study-related experience abroad. **Target B:** By 2020, every third university graduate should be able to demonstrate a stay abroad of at least three months and/or 15 ECTS.

Sources: documents named

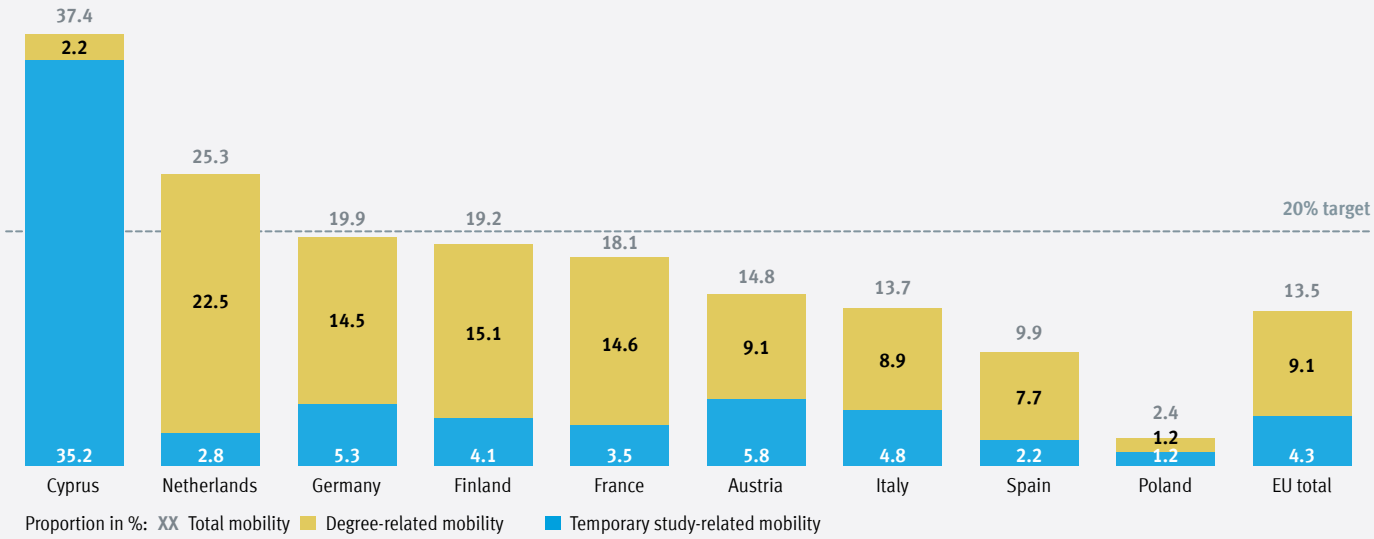
Footnotes

1 The Federal Statistical Office now collects university-specific data on the temporary study-related mobility of graduates. However, a significant number of universities are not yet in a position to record these mobility values in a meaningful way.

2 To date, the DSW and DZHW Social Survey has been conducted every four years. The most recent data are currently from 2016. The most recent data from the "Deutsche Studierende im Ausland" survey, conducted by the Federal Statistical Office, refer to 2018.

3 In the Social Survey, only appropriate data on the length of visits are available for the calculation of the 33% target. This means that those students who were abroad for less than three months, but still achieved and were credited with 15 ECTS points, are not reflected in this quota. However, this is likely to affect only a small number of mobile students.

C2.6 Mobility rates of university graduates in Germany and selected other countries in the 2018 graduation year, according to EU benchmarks

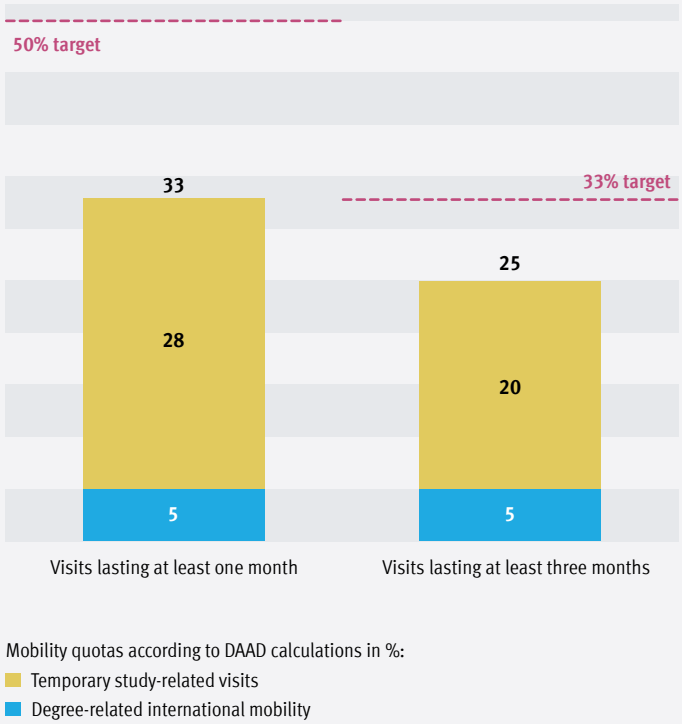


Source: European Commission, Education and Training Monitor 2020

for the calculation. In future, the European mobility benchmark will be calculated on the basis of higher education statistics, which is not yet possible for all countries. In Germany, too, a start to collect such data was only made in 2017, on the basis of the reformed Higher Education Statistics Act. For this reason, the results of graduate surveys are currently still being used to calculate the quotas.[1] To date, the DAAD has used the representative data (on students in later semesters) from the 21st Social Survey conducted by the German National Association for Student Affairs and the DZHW as a basis for extrapolating the German mobility rates (temporary study-related visits abroad) and the "Deutsche Studierende im Ausland" survey conducted by the Federal Statistical Office Germany (degree-related international mobility).[2]

Looking at the mobility rates based on the mobility definitions described above, it becomes clear that Germany had not yet reached the 20% target of the EU benchmark in 2018, but at 19.9% it is well above the EU average of around 14%. Only Cyprus and the Netherlands, which are much smaller countries, achieve higher mobility rates than Germany and are above the 20% target. Finland (19%) and France (18%) are just behind Germany, while other large countries such as Italy (14%), Spain (10%) and Poland (2%) have significantly lower rates (see Figure A1.8 on p. 19). With reference to 2018, German mobility targets for 2020 have also not yet been met. The corresponding figures are 33% (50% target) and 25% (33% target).

C2.7 Extrapolation of mobility rates of German university graduates, in 2016/17[2, 3]



Sources: DSW/DZHW, 21st Social Survey 2016; Federal Statistical Office, "Deutsche Studierende im Ausland" 2018; DAAD calculations

2.3 Host regions and host countries

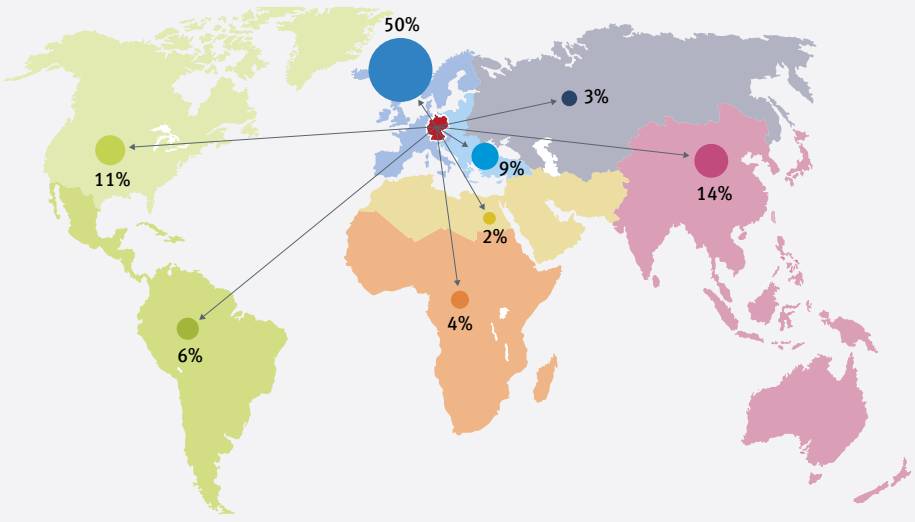
The regional preferences of German students abroad depend to an enormous extent on the type of international mobility in question. This becomes apparent in a direct comparison of students with and without the intention of completing their studies abroad (see also pp. 16/17). Although Western Europe is the principal host region, both in terms of temporary study-related visits abroad and degree-related international mobility, this predominance is much less pronounced with regard to temporary visits abroad (50%) than for degree-related international mobility (73%). A further difference is that, in the case of temporary stays abroad, those host regions accounting for less than 1% of students with respect to degree-related international mobility also play a certain role. These are: North Africa and Middle East (2%), Eastern Europe and Central Asia (3%), Sub-Saharan Africa (4%) and, in particular, Latin America (6%). Clearly, students are more willing to leave their more familiar cultural environment during these shorter stays abroad. The most important reason for this is probably the different motives for the two types of visit. In particular, motives such as broadening horizons, improving language skills and intercultural experiences, which usually dominate temporary study-related visits abroad, induce students to spend time outside Western Europe.[1]

> “Austria and Switzerland account for only 4% of temporary study-related visits, compared to 31% for degree-related mobility.

The findings that were already evident at the level of the host regions are also confirmed at that of the host countries. While the US and the United Kingdom are the most popular host countries for temporary study-related visits, the same applies to Austria and the Netherlands for degree-related international mobility. Moreover, the (fully or partially) German-speaking host countries Austria and Switzerland account for only 4% of temporary stays, whereas this figure is 31% for degree-related international mobility (see Figure C1.3 on p. 67). The geographical, cultural and also linguistic proximity of the host countries thus seems to play a much more important role as decision criterion in degree-related international mobility. The host countries France and Spain are also of far greater significance in temporary international mobility (8% each) than in degree-related mobility (5% and 1% respectively). An obvious explanation for this is that the choice of host country for temporary stays abroad is often also based on cultural interests, whereas in the case of degree-related international mobility, professional and career-related motives (such as the reputation of the respective foreign university and the suitability of the degrees for the German labour market) are much more important.

Different host country preferences can be observed even among temporary study-related visits abroad, depending on whether they are for study or placement stays. The two preferred host countries for placements are the United Kingdom (10%) and the US (9%), while Spain (11%) and France (10%) are the top two

C2.8 German students with study-related visits abroad, by host region, in 2016[2, 4]



- Western Europe
- Central and South Eastern Europe
- Eastern Europe and Central Asia
- North America
- Latin America
- North Africa and Middle East
- Sub-Saharan Africa
- Asia and Pacific

Multiple responses possible

Source: DSW/DZHW Social Survey 2016

Footnotes

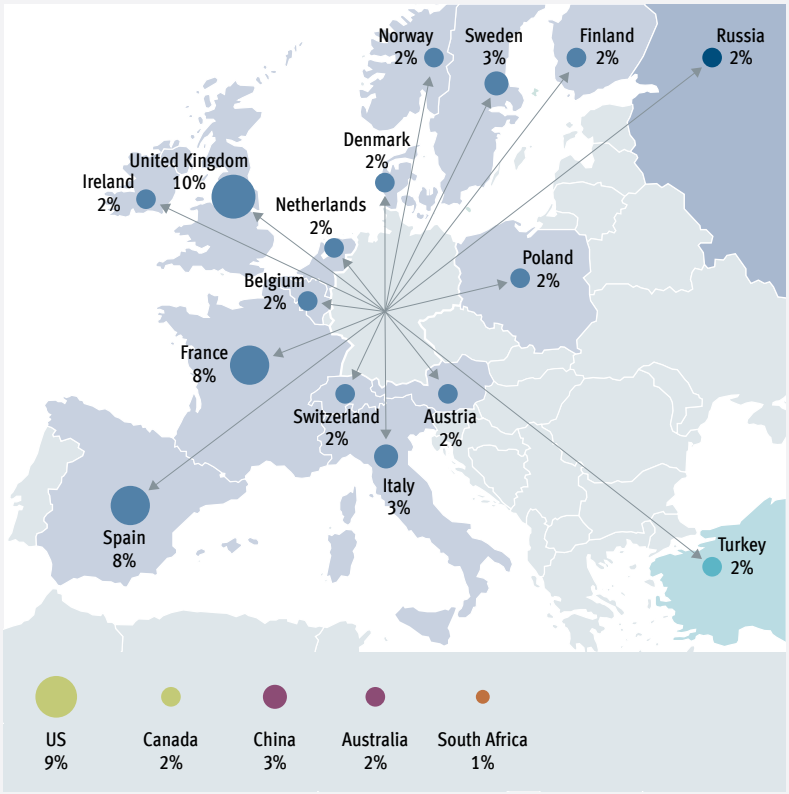
1 See *Wissenschaft weltoffen 2017*, p. 84/85.

2 Incl. Bildungsinlaender.

3 Only countries where at least 1% of the recorded stays occurred.

4 Deviations from 100% are due to rounding.

C2.9 German students with study-related visits abroad, by major host countries, in 2016[2, 3]



Multiple responses possible

Source: DSW/DZHW Social Survey 2016

countries for study-related stays. Other countries are also among the top ten most popular host countries for only one of the two types of visit. In the case of study visits, these are Sweden, Finland, Italy, Turkey and Australia, while in the case of placements, they are Switzerland, Belgium, India, South Africa and Austria.

Over 80% of temporary study-related visits do not last longer than six months, the average duration is 4.7 months. The most frequent stays are those lasting more than three to six months (43%), although short stays of up to one month also account for just under a quarter of all stays (23%). However, the length of stay varies considerably between the types of visit. On average, study-related visits last 2.5 months longer (6.1 months) than placement stays (3.6 months). This is primarily due to the fact that the majority of placements last a maximum of three months (60%). By contrast, stays of more than three months are normal when studying abroad (97%).

C2.10 German students with study-related visits abroad, by type of visit and key host countries, in 2016[2]

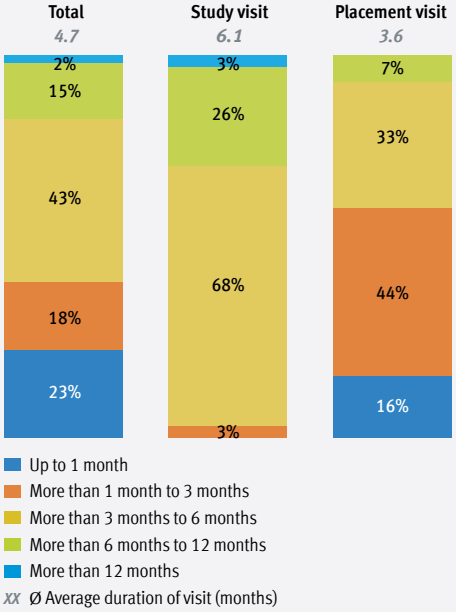
Study visits	
Top 10 host countries	Proportion in %
Spain	11
France	10
United Kingdom	9
US	9
Sweden	5
China	3
Finland	3
Italy	3
Turkey	3
Australia	3
Other countries	50

Placement visits	
Top 10 host countries	Proportion in %
United Kingdom	10
US	9
France	6
Switzerland	5
Spain	4
China	4
Belgium	3
India	3
South Africa	3
Austria	2
Other countries	51

Multiple responses possible

Source: DSW/DZHW Social Survey 2016

C2.11 Duration of German students' study-related visits abroad, by type of visit, in 2016[2, 4]



Source: DSW/DZHW Social Survey 2016

2.4 Mobility motivations and factors

From a student's perspective, what are the most compelling reasons for undertaking a study period abroad? A DAAD/DZHW mobility study explored this question in 2015.[1] It revealed that motivations for mobility can be assigned to six different dimensions or areas: personal development, immersion, language learning, academic study, career development and social recognition. The students involved in this survey identified personal development, immersion and language learning as particularly relevant to what they hoped to achieve from mobility.

These findings were confirmed by the DAAD's survey "Benchmark internationale Hochschule" (BintHo, see info box). project. This included a survey of 100,000 domestic students in Germany (Germans and Bildungsinlaender) in the 2020/21 winter semester, in which they were asked about their study-related international mobility.[2, 3] More than half of these students who had undertaken study-related visits abroad identified motivations for mobility from one of the three areas given above as being particularly important to their own mobility. Personal development (74%), cultural interest (64%), interesting and exciting experiences in the host country outside of university (58%) and improving language skills (57%).[4, 5] Five other pertinent motivations for mobility can be assigned to the dimensions of academic study and career development. These were: better chances in the employment market (40%), making contacts or expanding my network (33%), gaining knowledge in my specialist field (30%), getting to know a different university system and teaching methods (30%), and acquiring practical experience (23%). According to the survey, all other motives – particularly with regard to social recognition – are of only minor importance to students' interests in mobility.

The DAAD's BintHo survey surveyed internationally mobile students about their mobility motives as well as students who had not completed any study-related visit abroad, but who had considered one. Similar findings emerged here, with personal development being by far the most common primary motivation

Benchmark internationale Hochschule (BintHo)

In the 2020/21 winter semester, the DAAD invited all German Rectors' Conference member universities to participate in the first "Benchmark internationale Hochschule" (BintHo – International University Benchmark) survey. Among the 74 universities from 14 federal states that participated, 34 were universities of applied sciences, 33 were universities, 4 were colleges of education and 3 were colleges of art and music. The majority of these universities emailed all students to invite them to participate in the online survey, though in some cases the universities invited only certain groups of their students. The field phase of the survey ran from 30 November 2020 to 28 February 2021. Almost 100,000 domestic students (Germans and Bildungsinlaender) took part, along with around 20,000 international students, achieving a response rate of 12%.[2] To increase the significance of the findings presented here, the data were weighted using relevant characteristics from official student statistics.

C2.12 Motivations for study-related visits abroad among domestic students, by experience of mobility, in 2020/21[4]

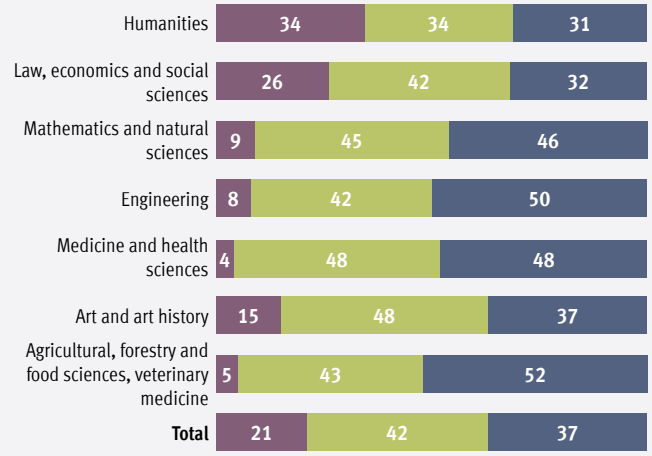
Motivations for study-related visits abroad	Internationally mobile students[5] Proportion in %	Internationally non-mobile students[6] Proportion in %
Personal development		
Personal development (e.g. becoming more confident or independent)	74	79
Immersion		
Cultural interest	64	49
Interesting and exciting experiences in the host country outside of university	58	45
Language learning		
Improving language skills	57	64
Career development		
Better chances in the employment market	40	45
Making contacts or expanding my network	33	38
Acquiring practical experience	23	24
Academic education		
Getting to know a different university system and different teaching methods	30	20
Gaining knowledge in my specialist field	30	23
Specific teachers or courses at the host university	9	6
Social recognition		
Following advice from those around me	8	2
Fulfilling others' expectations	2	2

Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

Footnotes

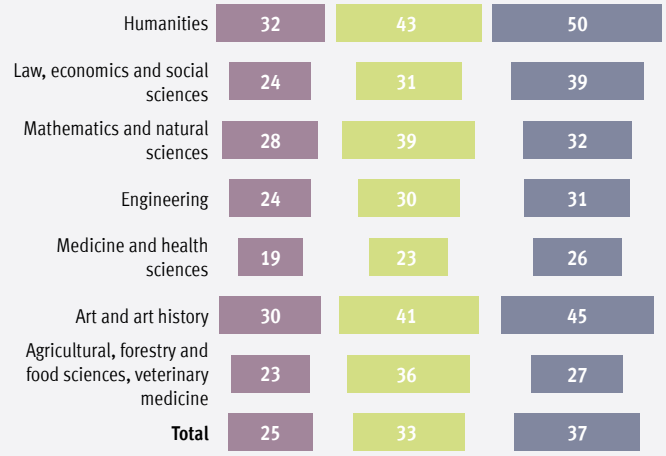
1 See Woisch/Willige (2015), p. 70 *ff.* and DAAD/DZHW (2017), p. 50/51.
2 Bildungsinlaender are students with foreign citizenship (or stateless persons) who have obtained their university entrance certificate at a German school.
3 See www.daad.de/bintho (available in German only).
4 Respondents were asked to choose up to three particularly relevant motives from a given list.
5 Reference group: German students and Bildungsinlaender who have completed study-related visits abroad.
6 Reference group: German students and Bildungsinlaender who have not completed study-related visits abroad but have considered doing so.
7 Reference group: German students and Bildungsinlaender who have completed study-related visits abroad and those who have not completed study-related visits abroad.
8 Percentages rated 4 or 5 on a scale of 1–5 where 1 means "not at all" and 5 means "to a very high extent".

C2.13 Level of obligation to complete study-related visits abroad, by subject group, in 2020/21[5]



Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

C2.14 Student perspectives on how teaching staff at German universities support study-related visits abroad, by subject group, in 2020/21[7]



Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

(79%). Among the other major motivations, improving language skills (64%) and chances in the employment market (45%) were identified somewhat more frequently than among the internationally mobile respondents. On the other hand, cultural interest (49%), and interesting and exciting experiences in the host country outside of university (45%) were named much less often.

Alongside students' individual motivations, other institutional and organisational conditions play a major role in influencing mobility. These factors vary significantly, depending on the domestic student's subject groups.[7] For example, there is a much higher proportion of internationally mobile students in the humanities and law, economics and social sciences subject groups as a visit abroad may be a compulsory element of their studies. How much support and motivation teaching staff give to visits abroad also varies between subject groups. Here, too, students in the humanities most frequently report such efforts on the part of the teachers. In contrast, this is indicated much less frequently by students in the fields of human medicine and health sciences.

C2.15 Potential digital services and their potential to increase willingness to engage in international mobility for non-internationally mobile students, in 2020/21[6]

Potential digital services	Increasing willingness to engage in mobility[8] Proportion in %
Being able to take exams at my home university during a visit abroad.	62
Ongoing access to support services at my home university during a visit abroad.	60
Still being able to take part in courses at my home university during a visit abroad.	59
Being able to complete all aspects of my study abroad in digital or virtual form without having to leave Germany.	24

Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

Digital services and support in the context of a study-related visit abroad are another factor that might influence mobility. This includes opportunities to continue to participate online in courses and examinations at a student's home university while abroad, or being able to access support services. Among domestic BintHo respondents who have not completed a study-related visit abroad, but have considered one, about 60% agreed with the view that such digital services would increase their willingness to undertake a study-related visit abroad. However, just under a quarter (24%) felt that the opportunity to complete visits abroad wholly digitally or virtually would increase the attractiveness of experiencing studying abroad.

2.5 Obstacles to mobility and difficulties with realising visits

The planning and realisation of study-related stays abroad can be compared figuratively to a hurdle race, in the course of which two decisive hurdles must be overcome: the decision hurdle (decision for or against a stay abroad) and the realisation hurdle (successful or unsuccessful planning of a stay abroad).[1] However, if the decision hurdle is not overcome, there will also be no attempt to overcome the realisation hurdle. In addition, problems can still arise during a realised stay abroad, which in the worst case can even lead to a termination of the stay.

The study-related international mobility of around 100,000 domestic students (both German students and Bildungsinlaender) was surveyed as part of the DAAD's "Benchmark internationale Hochschule" (BintHo) project during the 2020/21 winter semester.[2] Where a respondent had not completed a visit abroad and did not plan to do so over the course of the remainder of their studies, the most common reason given not to undertake such a visit was being separated from their social circle in Germany (53%).[3] Other major obstacles to mobility were that too much organisation was required (40%), costs were too high (38%) and loss of time (32%). All other obstacles were considered important by less than a quarter of respondents. A high level of consistency in students' views can be observed across all types of degrees. In only a few cases, such as the issue of losing time, did significant differences between types of degree become apparent.

Some students indicated they had originally planned a visit abroad but had not been able to realise their plans for certain reasons. Over a third of these respondents identified two main reasons as having had an important impact on the failure of their planned visit. These were financial difficulties (36%) and the fear of loss of time studying (35%). Between 20% and 30% of respondents identified other reasons for their visits not taking place. These reasons were: travel restrictions due to the Covid-19 pandemic (29%), the time required to organise a visit abroad (25%), difficulties in reconciling a visit with the standards and requirements

C2.16 Major reasons for lack of interest in study-related visits abroad among domestic students in Germany, by type of degree, in 2020/21[3, 4, 5, 6, 7]

Reasons not to undertake study-related visits abroad	Proportion in %		Proportion in % total
Separation from my social circle in Germany (e.g. friends, family, partner)	Bachelor's degree	53	53
	Master's degree	49	
	Other degrees	46	
Too much organisation required	Bachelor's degree	40	40
	Master's degree	44	
	Other degrees	38	
Costs too high	Bachelor's degree	37	38
	Master's degree	36	
	Other degrees	39	
Loss of time	Bachelor's degree	28	32
	Master's degree	32	
	Other degrees	48	
No interest in travelling abroad	Bachelor's degree	24	23
	Master's degree	19	
	Other degrees	23	
Inadequate foreign language skills	Bachelor's degree	21	20
	Master's degree	15	
	Other degrees	18	
No improvement in employment chances	Bachelor's degree	10	14
	Master's degree	12	
	Other degrees	19	
Fear of an unfamiliar environment	Bachelor's degree	15	14
	Master's degree	12	
	Other degrees	11	
Obligations to employers	Bachelor's degree	13	13
	Master's degree	17	
	Other degrees	7	
Risk of disease (e.g. due to the Covid-19 pandemic)	Bachelor's degree	13	13
	Master's degree	13	
	Other degrees	10	
Other reasons	Bachelor's degree	11	11
	Master's degree	14	
	Other degrees	12	
Would not increase academic knowledge	Bachelor's degree	9	11
	Master's degree	12	
	Other degrees	17	

Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

Footnotes

1 See Netz (2015).
2 See info box on p. 74 and www.daad.de/bintho (available in German only).
3 Respondents were asked to select up to three particularly relevant reasons from a given list.
4 Other degrees: German "Magister", "Diploma" and state examination degrees.
5 Bachelor's and master's programme students, not including teacher training.
6 Only including reasons identified by at least 10% of all respondents.
7 Reference group: German students and Bildungsinlaender who did not undertake a study-related visit abroad and do not intend to undertake one.
8 Reference group: German students and Bildungsinlaender whose planned study-related visits abroad did not come about.
9 Reference group: German students and Bildungsinlaender who have completed study-related visits abroad.

C2.17 Major reasons why planned study-related visits abroad for domestic students in Germany did not come about, by type of degree, in 2020/21[3, 4, 5, 6, 8]

Reasons why planned study-related visits abroad did not come about	Proportion in %		Proportion in % total
Difficulties with funding	Bachelor's degree	36	36
	Master's degree	34	
	Other degrees	38	
Loss of time	Bachelor's degree	31	35
	Master's degree	33	
	Other degrees	52	
Travel restrictions due to Covid-19 pandemic	Bachelor's degree	31	29
	Master's degree	32	
	Other degrees	20	
Organising visit abroad is too time-consuming	Bachelor's degree	25	25
	Master's degree	26	
	Other degrees	23	
Difficulties aligning my visit with the standards and requirements of my study programme	Bachelor's degree	20	24
	Master's degree	23	
	Other degrees	39	
Concerns about diseases (e.g. Covid-19 pandemic)	Bachelor's degree	23	21
	Master's degree	22	
	Other degrees	13	
My own inactivity	Bachelor's degree	18	19
	Master's degree	21	
	Other degrees	17	
Separation from partner, friends etc.	Bachelor's degree	18	18
	Master's degree	18	
	Other degrees	16	
Other reasons	Bachelor's degree	15	15
	Master's degree	15	
	Other degrees	12	
Likely problems with recognition of academic achievements abroad	Bachelor's degree	11	13
	Master's degree	13	
	Other degrees	22	
Difficulties with finding tailored and helpful information	Bachelor's degree	11	11
	Master's degree	10	
	Other degrees	10	

Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

C2.18 Major problems affecting study-related visits abroad for domestic students in Germany, by type of degree, in 2020/21[3, 4, 5, 6, 9]

Problems affecting study-related visits abroad	Proportion in %		Proportion in % total
Finding accommodation in the host country	Bachelor's degree	25	26
	Master's degree	27	
	Other degrees	24	
Restrictions to my planned activities due to the Covid-19 pandemic	Bachelor's degree	29	22
	Master's degree	17	
	Other degrees	20	
None of the stated problems occurred	Bachelor's degree	17	19
	Master's degree	19	
	Other degrees	17	
Loss of time	Bachelor's degree	13	16
	Master's degree	16	
	Other degrees	19	
Language difficulties	Bachelor's degree	16	16
	Master's degree	16	
	Other degrees	20	
Unplanned changes to the curriculum (e.g. course cancellations)	Bachelor's degree	15	14
	Master's degree	15	
	Other degrees	12	
Difficulties with environmentally friendly travel to/from host country	Bachelor's degree	13	13
	Master's degree	13	
	Other degrees	12	
Organisational problems at the university in the host country	Bachelor's degree	14	13
	Master's degree	13	
	Other degrees	16	
Problems with recognition of academic achievements abroad	Bachelor's degree	12	13
	Master's degree	13	
	Other degrees	16	
Difficulties with funding	Bachelor's degree	11	11
	Master's degree	11	
	Other degrees	11	
Loneliness, difficulties making contacts	Bachelor's degree	11	10
	Master's degree	9	
	Other degrees	8	

Source: DAAD, Survey "Benchmark internationale Hochschule" (BintHo) 2020/21; DAAD calculations, weighted values

of their study programme (24%) and health concerns in the light of the Covid-19 pandemic (21%). The main differences between bachelor's and master's degree students, and students on other degrees included obstacles due to Covid-19, considerations about loss of time and the difficulty of reconciling visits with the standards and requirements of the study programme.[4] One primary reason that bachelor's and master's degree students identified Covid-19 related obstacles more often might be that these respondents have a shorter standard period of study, which means that a larger part of their planned visit fell in the period of the pandemic than for students on other types of degree.

Students who already had study-related experience of visits abroad were also asked in the DAAD's BintHo survey about the key problems they faced during their visits. Only two issues were identified by more than a fifth of respondents in this regard: finding accommodation in the host country (26%) and restrictions to planned activities caused by the Covid-19 pandemic (22%). While the difficulties of finding accommodation abroad affected students regardless of their type of degree, the restrictions to planned activities due to Covid-19 were perceived as a critical issue by bachelor's degree students much more often (29%) than students on other types of degree (17% for master's degrees and 20% for other types of degree).

2.6 Erasmus visits

Since the start of the Bologna Process in 1999, the number of annual Erasmus visits by students from German universities has almost trebled from around 14,700 to around 42,300 in the 2019 Erasmus year.[1] The total number of Erasmus participants from Germany has therefore increased much more significantly since 1999 (+188%) than the number of students in Germany over the same period (+59%). The number of Erasmus participants at universities of applied sciences has risen more dramatically over the last ten years (+60%) than at universities (+42%).[2, 3] In 2019, there was also a stronger increase (+2%) in Erasmus participants at universities of applied sciences than at universities (+0.3%). Universities of applied sciences now account for 29% of all Erasmus participants.

> “Compared to last year, the number of Erasmus participants is especially increasing in Turkey, Norway, Austria and Italy.

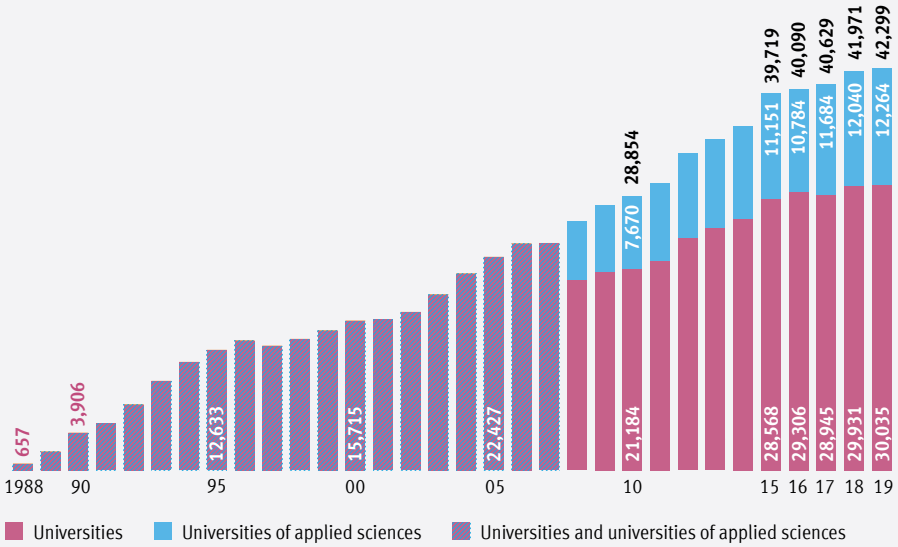
Data basis

The data on temporary international mobility presented on pp. 78/79 refer exclusively to visits undertaken under the EU’s Erasmus+ mobility programme. The basis for this are the DAAD Erasmus statistics. According to the findings of the DAAD and DZHW mobility study, around 40% of all temporary study-related visits abroad by German students are undertaken via Erasmus+. Both German and international students are eligible for funding if they wish to complete a study or placement visit in one of the 34 participating programme countries, are regularly enrolled at a German university, have completed their first academic year, their university participates in Erasmus+, and their home university and their prospective host university have concluded an Erasmus cooperation agreement. The present analyses therefore refer to all Erasmus participants from Germany – more precisely: from German universities – and not only to German Erasmus participants.

As in previous years, Spain was again the most popular destination for Erasmus participants from Germany in the 2019 Erasmus year, followed by France and the United Kingdom. That said, the number of Erasmus visits has declined in all three countries: by 2% in France and Spain, and even by 6% in the United Kingdom. Among the ten key host countries, other declines have occurred in the Netherlands (-1%) and Sweden (-3%).

The other five key host countries for Erasmus participants from Germany have seen increases from last year. These are: Ireland (+1%), Finland (+3%), Italy (+4%), Austria (+8%) and Norway (+10%). The number of Erasmus participants in Turkey had fallen sharply between 2015 and 2018. Thus, with around 1,200 visits in 2019, it is no longer one of the key host countries.

C2.19 Erasmus participants from Germany, by type of university, since 1988[1, 2, 3]



Source: DAAD, Erasmus statistics

Footnotes

1 Erasmus statistics to 2014: an Erasmus year begins in the winter semester and ends in the summer semester of the following year. 2014 = winter 2013/14 + summer 2014.
New Erasmus statistics from 2015: an Erasmus year begins on 1 June of the preceding year and ends on 31 May of the following year. 2019 = 1.06.2018 to 31.05.2020

2 A breakdown of visits by type of university is only possible from the 2008 Erasmus year onwards.

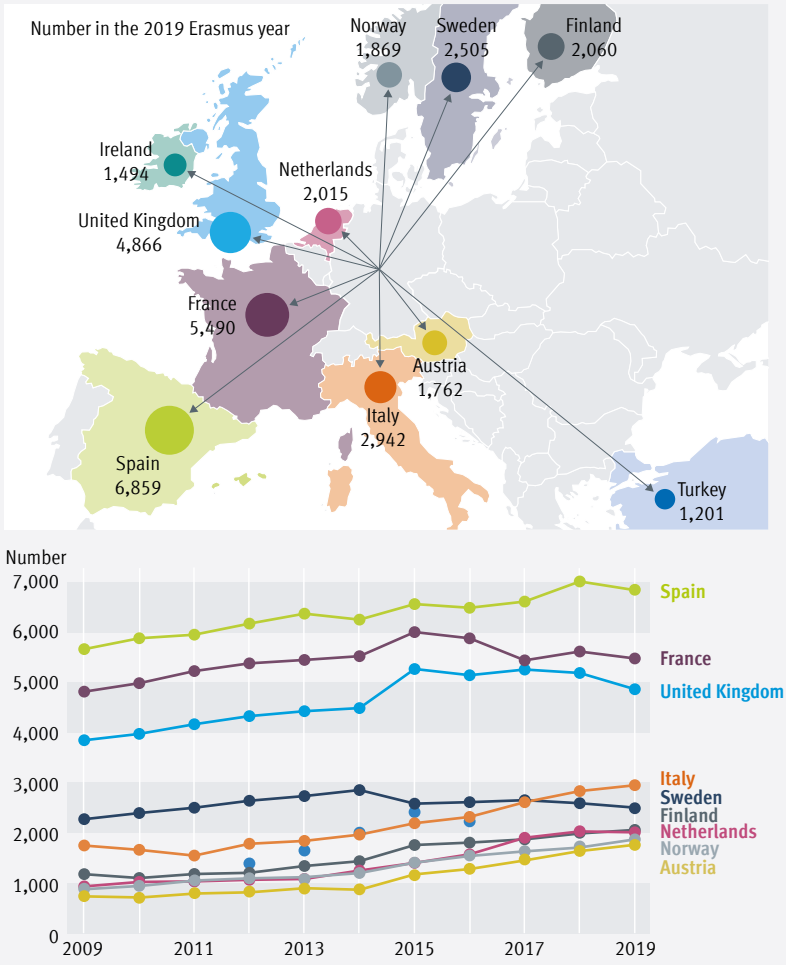
3 Colleges of art and music, and other higher education institutions were added to the universities. These universities account for less than 2% of all Erasmus visits.

4 Subject group distribution among all students in Germany during the 2018 academic year according to Eurostat. In Erasmus statistics, subject groups are classified according to ISCED standards and therefore differ from the Federal Statistical Office’s standard classification.

5 The percentages of all students in Germany refer to the winter semester 2018/19.

6 For reasons of clarity, Ireland and Turkey are not included in the lower part of the graph.

C2.20 Erasmus participants from Germany, by major host countries, in 2019 and since 2009[1, 6]



Source: DAAD, Erasmus statistics

A look at the distribution of Erasmus participants from Germany by subject groups shows that students from the social sciences, journalism and information studies are particularly well represented.[4] Their proportion among Erasmus participants is almost twice as high (15%), than their share of all students in Germany (8%).[5] The arts and humanities, as well as business, administration and law, are also clearly over-represented. By contrast, education studies, engineering, manufacturing and construction, as well as information and communication technologies, are strongly under-represented. In the case of information and communication studies, they make up only 3% of all Erasmus participants, less than half of their share of all students (7%).

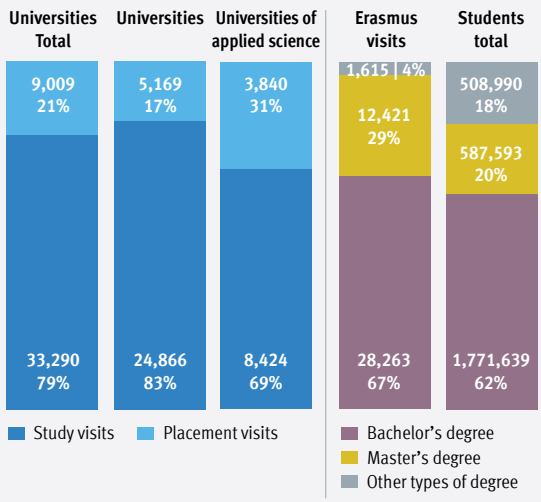
79% of all Erasmus visits by students from Germany in the Erasmus year 2019 were for study visits, while 21% were for placements. At universities of applied sciences, however, the proportion of placements is significantly higher (31%) than at universities (17%). Bachelor's students accounted for 67% of Erasmus visits, while the figure for master's students was 29%. Comparing this distribution with that of all students in Germany, both types of degree are over-represented among Erasmus participants, while state examinations, doctorates and other types of degree are strongly under-represented.

C2.21 Erasmus participants from Germany and all students in Germany, by subject group, in 2019[1, 4, 5]

Proportion of all students in Germany in %	Subject group	Proportion of all outgoing Erasmus participants in %
8.0	Education	4.5
13.2	Humanities and arts	17.7
8.1	Social sciences, journalism and information	14.9
22.1	Business, administration and law	28.7
10.2	Natural sciences, mathematics and statistics	8.2
7.1	Information and communication technologies	3.0
19.9	Engineering, manufacturing and construction	12.7
1.5	Agriculture, forestry, fisheries and veterinary	1.3
7.6	Health and welfare	6.9
2.1	Services	2.0

Sources: DAAD, Erasmus statistics; Federal Statistical Office, student statistics; DAAD calculations

C2.22 Erasmus participants from Germany, by type of university, type of visit and type of degree, in 2019[1, 3]



Number and proportion in %
Source: DAAD, Erasmus statistics; DAAD calculations

SPOTLIGHT

German students' international mobility under Covid-19

How has the international mobility of German students changed since the beginning of the Covid-19 pandemic? We have reached the point where it is possible to begin to answer this question, although only with reference to temporary study-related visits abroad (*credit mobility*). As in Germany, the key host countries for German students generally publish their respective student statistics roughly a year after the period under consideration. At the time of going to press, of the ten key host countries for German students (see Fig C1.3 on p. 63), data on the 2020/21 winter semester were only available for Switzerland. The example of Switzerland, however, shows that it can by no means be taken for granted that there was a general reduction in the numbers of German students (intending to graduate) in the host countries concerned because of the Covid-19 pandemic. 12,566 German students were enrolled at Swiss universities in the 2020/21 winter semester, an increase of over 400 students (around 4%) compared to the previous year. It should be assumed that the changes in degree-related student mobility for German students will vary greatly from host country to host country. However, it will not be until the next edition of *Wissenschaft weltoffen* that reliable conclusions can be drawn on this.

> "In 2019, around 41,000 regular Erasmus visits were undertaken and not curtailed. In 2020, around 21,000 regular stays were realised.

As has already been mentioned, the situation is different for temporary study-related visits abroad by German students. For an initial assessment of how their numbers have changed since the beginning of the Covid-19 pandemic, we can draw not only on Erasmus data but also on the results of the DAAD's two Covid-19 surveys of the International Offices at German universities. We also have the findings from a student survey conducted as part of the DAAD's survey "Benchmark Internationale Hochschule" (BintHo).[2]

If we consider how the numbers of Erasmus visits by students from Germany have changed between 2019 and 2020, it emerges that the number of standard[1] or fully in-person visits decreased from around 41,000 in 2019 to only around 21,000 in 2020,a fall of around 50%. Nonetheless, it should be borne in mind that Erasmus visits are distributed very unevenly over the course of a year, with substantially more visits beginning in the second half of the year. As is clear from Fig. CS1, the decline in Erasmus mobility was particularly steep in the latter half of the year. Between January and June 2020, the number of standard Erasmus visits that were begun fell by 34% compared to the previous year. However, visits beginning between July and December fell by 57%. Data on Erasmus visits are also already available for the first five months of 2021. Comparing the first five months of 2019 (before the pandemic began) with the first five months of 2021 shows a 35% decline in standard Erasmus visits. This puts the number of Erasmus visits in the first five months of 2021 (around 8,100) slightly below the same period in 2020, (around 8,400).

If the two types of Erasmus visits are considered separately, it emerges that both study visits and placements dropped by 50% for the whole of 2020, compared to 2019. However, a closer examination of the trends in these two cases reveals that the reduction in placements due to Covid-19 was spread much more evenly across the year than for study visits. While placement visits fell by almost equal amounts in each half of the year (–51% and –48% respectively), the 59% reduction in study visits in the second half of the year (July to December) was more than twice as high as the 25% decline in the first half of the year (January to July). The reason for this may

Footnotes

1 Unlike in official Erasmus statistics, standard Erasmus visits are here considered only to be those visits that were undertaken wholly in-person within the host country. From June 2020 onwards, official Erasmus statistics also record visits undertaken in hybrid form (i.e. a combination of physical and virtual) as standard visits.

2 See Info box on the BintHo project on page 74 and www.daad.de/bintho (only available in German).

3 The timing of the planned visit was not surveyed, making an evaluation of this kind impossible.

4 The results of the DAAD's two Covid-19 surveys (see DAAD 2020b, 2021) may be found on the DAAD's website at www.daad.de/analysen-studien (also only available in German).

5 Because Erasmus statistics only distinguish between standard, virtual, hybrid, curtailed and cancelled visits from July 2020 onwards, data with this degree of specificity are not available for the first half of 2020.

6 Assessments by heads of International Offices surveyed.

7 Deviations from 100% are due to rounding.

8 Survey period: April/May 2020.

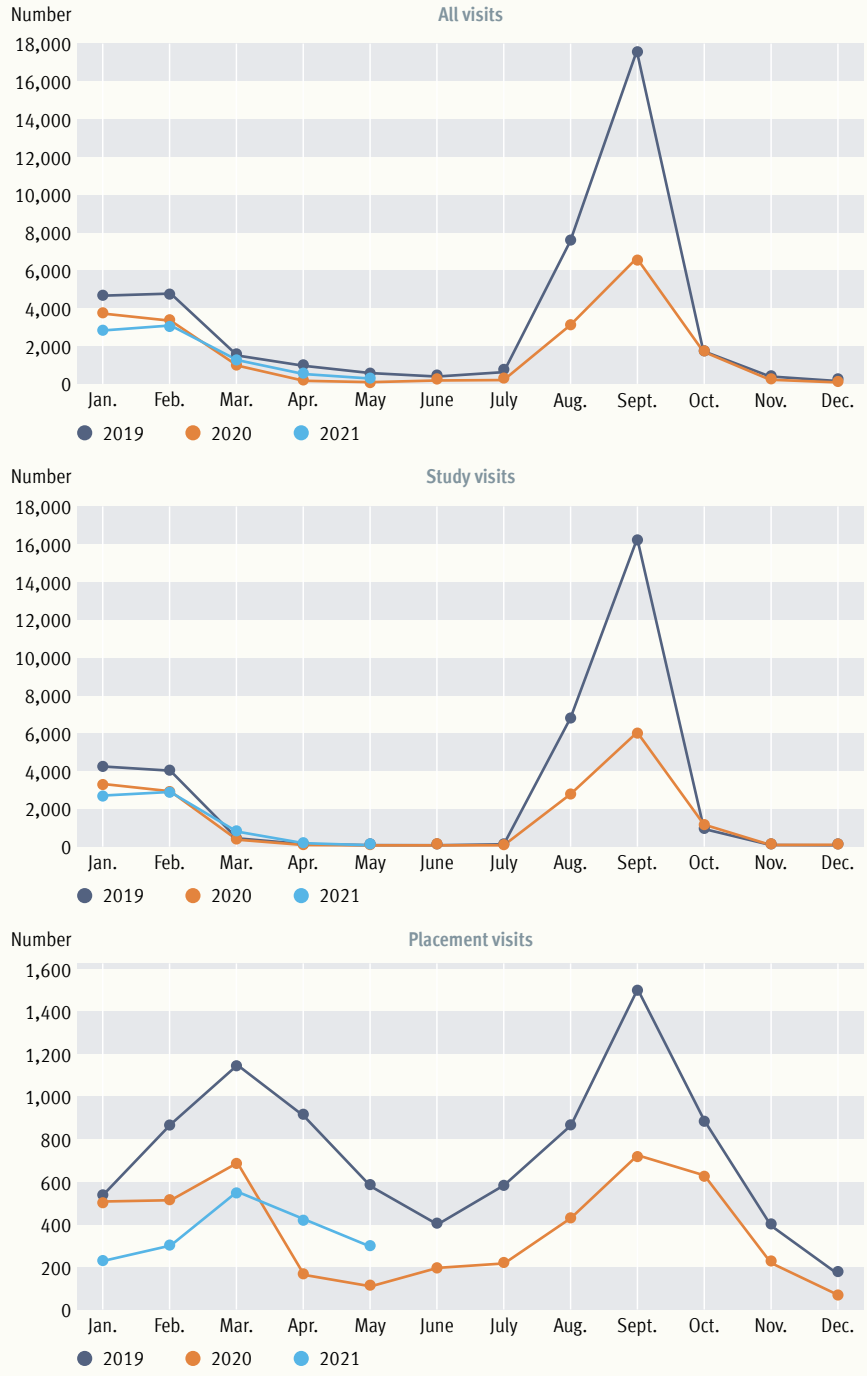
9 Survey period: February 2021.

be that many partner universities abroad increasingly limited Erasmus exchanges in the second half of the year. As was the case at universities in Germany, the majority of these universities suspended in-person visits and teaching due to Covid-19 in the second half of 2020. By contrast, completion rates of Erasmus placement visits were affected to similar extents in both halves of the year. Compared to 2019, there was a 25% fall in study visits and a 56% fall in placement visits in the first five months of 2021. Here, too, there were only slight changes in comparison to the first half of 2020.

> “Travel restrictions and health concerns associated with the Covid-19 pandemic were among the key obstacles to mobility identified by students surveyed in the 2020/21 winter semester.

Since July 2020, Erasmus statistics have also included two new categories of visits that could not be completed in-person, as had previously been the standard for such visits, due to the Covid-19 pandemic. The first category includes those visits that were undertaken fully or partly digitally (with the participant based at home or in the host country). The second category includes those visits that had to be abandoned, shortened, which could not take place at all or which had to be postponed. Using these data makes it possible to analyse the effect of Covid-19 on Erasmus mobility with greater precision. According to this analysis, over 20,000 standard visits took place between July 2020 and May 2021, despite the Covid-19 pandemic. They account for

CS1 Number of standard Erasmus visits undertaken by students from Germany, by type of visit and starting month, between January 2019 and May 2021[1]



Source: DAAD, Erasmus statistics; DAAD calculations

German students' international mobility under Covid-19

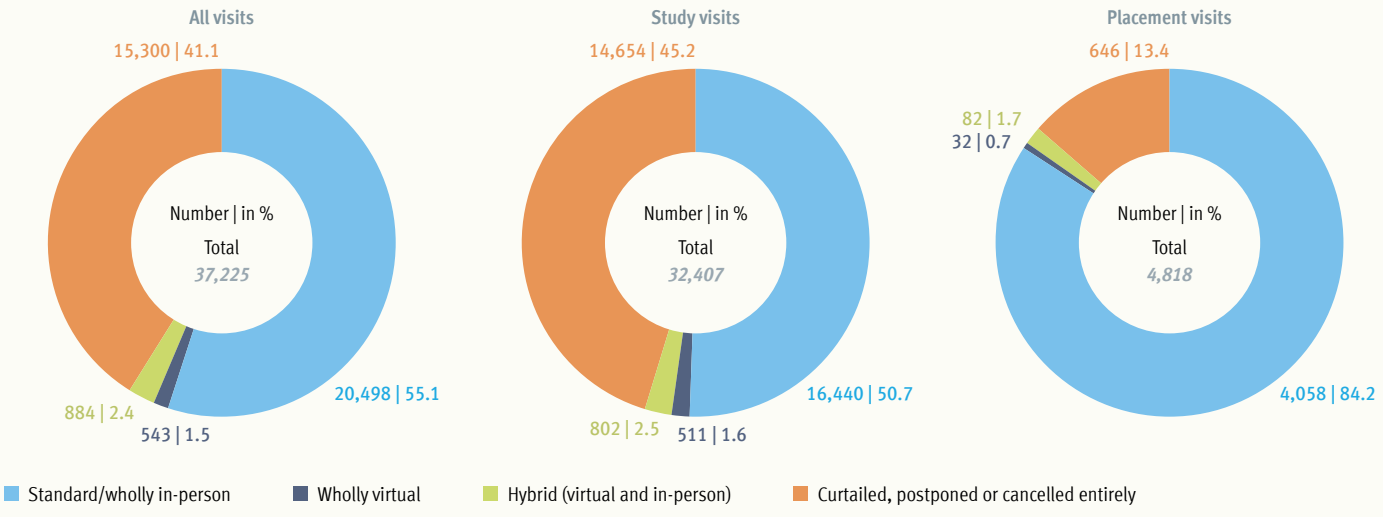
55% of the visits granted during this period. Around 15,000 (41%) of the visits approved during this period could not take place, or had to be curtailed or abandoned. Almost 900 visits (1.5%) were undertaken in purely digital form – in other words, without physically visiting the host country. Around 500 cases took a hybrid form, partly digitally (based in the home or host country) and partly in person at the host institution abroad.

Significant differences can also be observed between placement and study visits. Over half (51%) of the study visits granted were completed in regular form, whereas the respective percentage of placement visits came to well over three quarters (84%). Placement visits in purely digital form were also much less common than purely virtual study visits (0.7% vs 1.6%), and visits in hybrid form were also more common among study visits than for placements (2.5% vs 1.7%). It appears that relatively short-term restrictions on Erasmus visits were more common at partner universities than at firms offering placements. Correspondingly, placement visits have proved to be less contingent on the short-term fluctuations in the Covid-19 pandemic than study visits.

> "43% of the heads of International Offices surveyed in February 2021 predicted that students' levels of interest in study-related visits abroad would increase in the 2020/21 winter semester, while only 15% expected levels of interest to fall further.

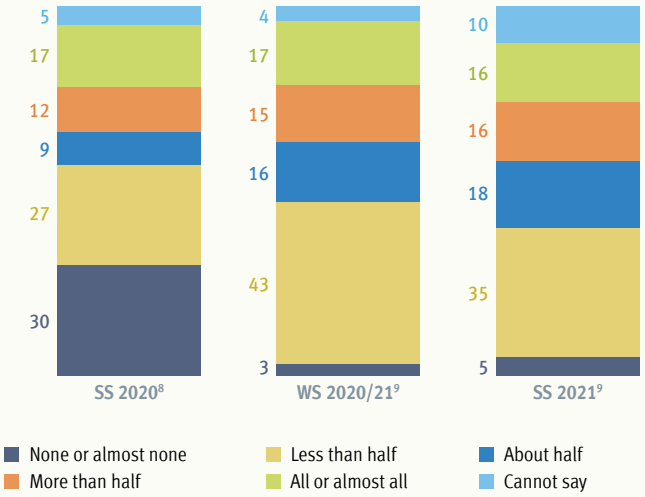
The findings of the DAAD's BintHo survey, carried out in the 2020/21 winter semester with almost 120,000 respondents at 74 German universities, also convey the impact of the Covid-19 pandemic on student international mobility (see also Fig. C2.17 on p. 77). Those respondents who had planned a visit abroad but were not able to undertake it for some reason were asked to choose up to three reasons that were the main causes of the failure of their visit. 29% of students in this group indicated that travel restrictions due to the Covid-19 pandemic were some of the key obstacles, while 21% stated health concerns associated with the Covid-19 pandemic. It should be noted that these percentages would probably be much higher if the survey only included respondents who had planned a visit for 2020 or 2021.[3]

CS2 Standard and non-standard Erasmus visits completed by students from Germany, by type of visit, beginning between July 2020 and May 2021[1, 5]



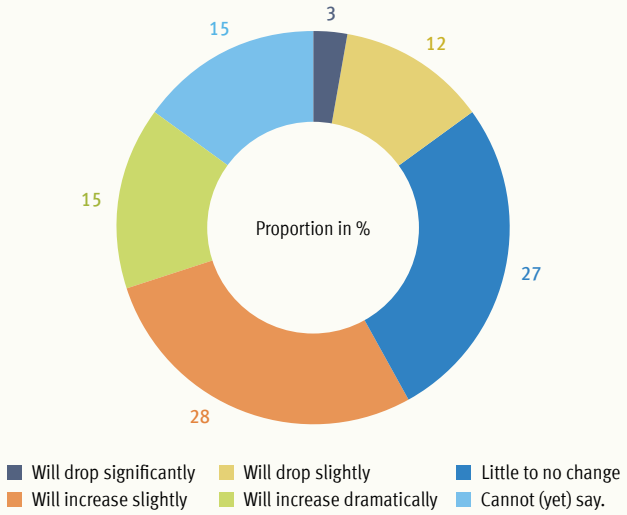
Source: DAAD, Erasmus statistics; DAAD calculations

CS3 Estimated proportion of students in Germany who cancelled or postponed a study-related visit abroad due to the Covid-19 pandemic in the 2020/21 winter semester[4, 6, 7]



Sources: DAAD, Covid-19 Surveys of heads of International Offices 2020, 2021

CS4 Forecast changes of interest among students in Germany regarding study-related visits abroad in the 2021/22 winter semester, compared to the 2020/21 winter semester[4, 6, 9]



Sources: DAAD, Covid-19 Surveys of heads of International Offices 2020, 2021

Finally, the DAAD's Covid-19 surveys of heads of International Offices (IOs) at German universities in the 2020 summer semester and 2020/21 winter semester offer a further perspective.[4] Over 170 of the 268 member universities of the HRK [German Rectors Conference], participated – that is, more than two thirds of the total. According to the first survey in April and May 2020 (i.e. the start of the summer semester), 38% of IO heads reported that, at their university, at least half of students had to cancel their planned visits abroad in the summer semester due to the pandemic. This rose to 48% in the second survey with reference to the 2020/21 winter semester and to 50% with regard to the 2021 summer semester. Nevertheless, the respondents seemed much more optimistic about the 2021/22 winter semester. 43% predicted that students' levels of interest in study-related visits abroad would increase compared to the previous winter semester, while only 15% expected further declines in levels of interest.

1.1 Mobility trends, regions and countries of origin

In 2019[1], international academic staff[2] at German universities amounted to around 51,800 academic and artistic staff of foreign nationality, or 12.7% of all academic staff. Since 2016, the number of international staff has increased by 13%. By comparison, the number of German academics and researchers has only increased by 4% over the same period.

However, this dynamic cannot be observed for all groups of international academic staff. The trend seems to be slower for international professors in particular. In 2019, a total of around 3,500 professors of foreign nationality held posts at German universities. Their number has increased by 9% since 2016. The slower increase compared to other international staff is also explained by the fact that professors are appointed for life. Positions of this kind usually only become vacant when the age limit is reached.

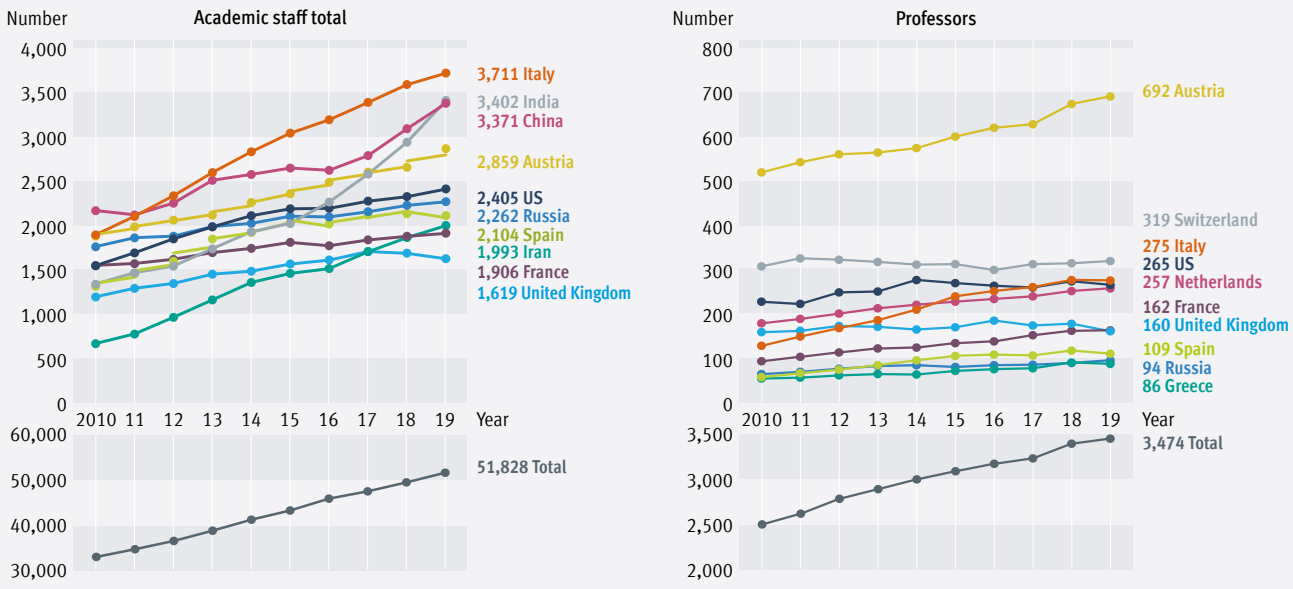
International professors account for only 7.2% of all professors at German universities. This is a much lower proportion than that of international staff among all academic staff. Even among international academic staff, only 7% are professors. However, this figure is 15% among German academic staff. This situation may be due both to "secret" appointment hurdles and to a lower number of international applicants. Above all, professorships at universities of applied sciences, which account for almost half of all professorships at German universities, may not be attractive enough for international applicants due to a lack of recognition and prestige. Moreover, international applicants are also less likely to be considered due to inadequate German language skills or they may even forego applying altogether.

These assumptions are confirmed when comparing the types of universities. While international staff at universities account for 15.2% of all academic staff and international professors for 10.6% of all professors, they constitute 5.7% of all academic staff and 2.6% of professors at universities of applied sciences. At universities of art and music, international academic staff make up 19.3%, and the percentage for international professors is even 21.2%.

The key countries of origin for international academic staff at German universities are Italy, India, China, Austria, the US, Russia and Spain. While Italy, Austria and the US have recorded average increases in numbers of academic staff since 2016, the rate is below average for Russia (+8%) and Spain (+5%), and well above average for India (51%) and China (+29%).[3]

Among international professors, Austria is by far the most important country of origin, followed by Switzerland, Italy and the US. The two German-speaking countries of origin, Austria and Switzerland, account for almost one third of all international professors, at 20% and 9% respectively. However, while the number of Austrian professors has grown by 11% since 2016, the Swiss figures have not changed significantly for some time. The largest increases can be observed for India (+48%) and Turkey (+47%). The number of professors from Canada and the United Kingdom, on the other hand, has decreased significantly in recent years (–13%).[4]

D1.1 Total international academic staff and international professors, by key countries of origin, since 2010[2]



Source: Federal Statistical Office, university staff statistics

A regional breakdown shows that the Western Europe region of origin dominates both for international academic staff as a whole and for international professors. Of all international staff, 35% come from Western European countries; for professors, the figure is as high as 66%. Other major regions of origin for academic staff are Asia and Pacific (19%), Central and South Eastern Europe (13%), and North Africa and Middle East (10%). In the case of international professors, these are Central and South Eastern Europe (10%), and North America (9%). The significance of Western Europe is also reflected in the other groups of internationally mobile academics and researchers who come to Germany (see p. 94/95). This is partly attributable to the high level of the academic and higher education systems in those countries, but also to corresponding cooperative relationships between universities and historic, economic and political relationships such as those in the context of the EU.

Footnotes

1 Data from the German Federal Statistical Office on academic staff at universities refer to reporting years (January-December) and not to academic years.

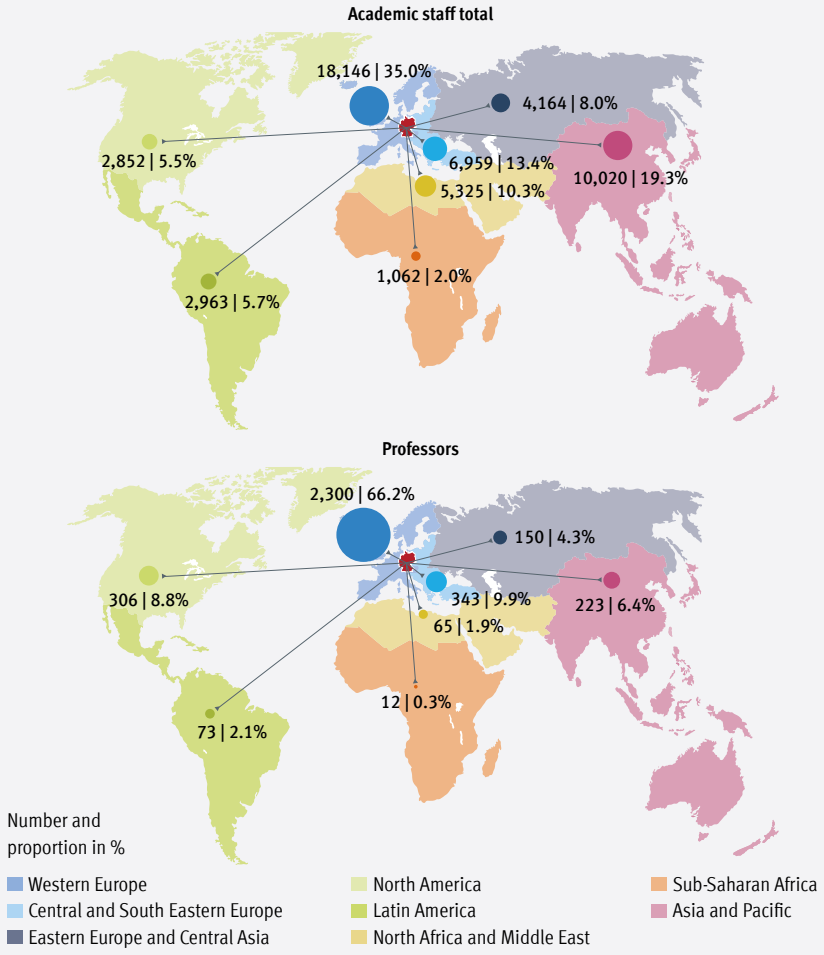
2 International academic staff comprise all academic and artistic staff at German universities of foreign nationality, including academic and artistic staff without details of nationality. The following groups are included in academic and artistic staff: professors, lecturers and assistants; academic and artistic staff; teaching staff with specific duties; visiting professors and professors emeriti; assistant lecturers and honorary professors; private lecturers and research assistants (i.e. with a degree).

3 Only countries with at least 50 academic staff at German universities.

4 Only countries with at least 20 professors at German universities.

5 Specific nationality data are not available for 337 academic and artistic staff, including two professors. They make up about 1% of the international academic staff.

D1.2 Total international academic staff and international professors, by region of origin, in 2019[5]



Sources: Federal Statistical Office, university staff statistics; DZHW calculations

D1.3 International academic staff as a proportion of all academic staff, by type of university, in 2009, 2014 and 2019

Type of university	Staff	Year	In %
Universities	International academic staff	2009	11.3
		2014	12.7
		2019	15.2
	International professors	2009	8.2
		2014	9.6
		2019	10.6
Universities of applied sciences	International academic staff	2009	4.6
		2014	5.1
		2019	5.7
	International professors	2009	1.9
		2014	2.3
		2019	2.6
Colleges of art and music	International academic staff	2009	14.2
		2014	16.3
		2019	19.3
	International professors	2009	18.9
		2014	20.9
		2019	21.2

Sources: Federal Statistical Office, university staff statistics; DZHW calculations

1.2 Federal states and subject groups

Most academic and artistic staff of foreign nationality work at universities in North Rhine-Westphalia (19%), Baden-Wuerttemberg (18%) and Bavaria (17%). These three federal states alone account for more than half of international academic staff. The same also applies to international professors. The number of international staff depends not only on the number and size of the universities in a federal state but also on structural aspects such as the proportions of different types of universities and the subjects offered. Proximity to other countries' borders and the attractiveness of certain locations are also factors. The universities in Saarland (17.6%), Berlin (15.8%) and Brandenburg (15.2%) therefore have particularly high shares of international staff. This figure is relatively low for Mecklenburg-Western Pomerania (9.5%) and Schleswig-Holstein (10.5%). A similar picture emerges for the proportion of international professors as a percentage of the total professorial body. Here, Berlin's universities lead the field with 11.4%, while in Mecklenburg-Western Pomerania only 3.7% of professors come from abroad.

> "One fifth of staff in mathematics and natural sciences come from abroad.

The quantitative rise in international academic staff has played out differently across the various federal states. Saxony-Anhalt saw a substantial increase of +129%, while Saarland recorded a much lower level of +51%. By contrast, numbers of international professors have changed at much more widely varying rates. The highest growth rates between 2009 and 2019 were recorded for Rhineland-Palatinate (+105%) and Saxony-Anhalt (+76%), while Brandenburg (+15%) and Saxony (+16%) reported a very low rate. It is important to note when interpreting these findings that the differences are also linked to state-level programmes to enhance staffing levels at universities.[1]

International academic staff are represented to varying degrees across the various subject groups. The highest percentage of foreign academic staff is in the mathematics and natural sciences subject group (21%). Engineering (20%) and medicine and health sciences (19%) are represented at similar levels. 12% of international academic staff work in the humanities, 11% in law, economics and social sciences, and 10% in central institutions of the universities. Setting these figures against those for German academics and researchers reveals two key differences. While the proportion of foreign academic staff is only half as high as that of German staff in law, economics and social sciences, it is around twice as high in mathematics and natural sciences.

D1.4 Total international academic staff and international professors, by federal state, in 2019 and change since 2009[2]

	International academic staff		International professors		Change 2009–2019 in %	
Germany	Number	Proportion in %	Number	Proportion in %	Academic staff	Professors
Baden-Wuerttemberg	9,356	12.6	578	7.7	65	52
Bavaria	8,591	14.2	574	8.1	86	69
Berlin	4,186	15.8	426	11.4	84	69
Brandenburg	1,128	15.2	54	5.8	103	15
Bremen	588	13.2	53	7.6	65	33
Hamburg	1,688	11.0	120	6.9	102	36
Hesse	3,275	11.9	234	6.2	72	57
Mecklenburg-Western Pomerania	600	9.5	30	3.7	79	58
Lower Saxony	3,469	12.1	208	5.6	71	46
North Rhine-Westphalia	9,848	11.4	676	6.6	77	54
Rhineland-Palatinate	1,872	12.0	131	6.1	82	105
Saarland	776	17.6	33	6.5	51	27
Saxony	2,822	12.9	138	6.1	74	16
Saxony-Anhalt	1,052	12.1	65	6.3	129	76
Schleswig-Holstein	939	10.5	74	6.6	93	64
Thuringia	1,382	13.6	80	6.5	101	31
Total	**51,828**	**12.7**	**3,474**	**7.2**	**78**	**55**

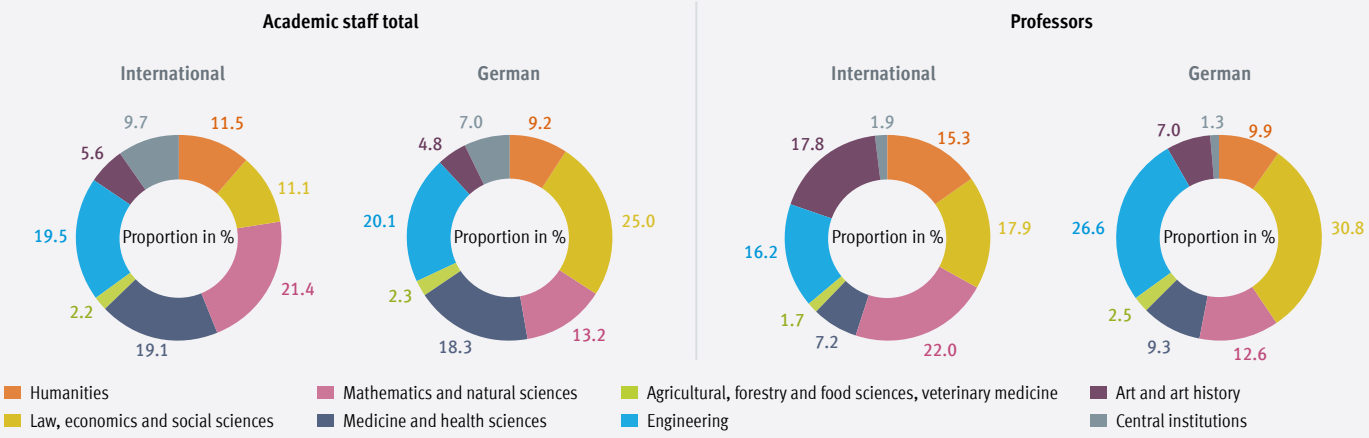
Sources: Federal Statistical Office, university staff statistics; DZHW calculations

D1.5 International academic staff as a percentage of total academic staff, and international professors as a percentage of all professors, by type of university and subject group, in 2019

Subject groups	Universities	Universities of applied sciences	Universities	Universities of applied sciences
	Proportion of all academic staff in %		Proportion of all professors in %	
Humanities	15.1	20.6	11.1	5.4
Law, economics and social sciences	8.1	3.9	7.0	2.3
Mathematics and natural sciences	19.7	6.9	13.2	2.4
Medicine and health sciences	13.9	2.0	6.4	1.9
Agricultural, forestry and food sciences, veterinary medicine	16.2	3.1	8.6	1.1
Engineering	17.9	5.1	9.3	2.5
Art and art history	16.2	6.8	19.4	6.5
Central institutions	16.9	15.8	14.0	3.6
Total	**15.2**	**5.6**	**10.6**	**2.6**

Sources: Federal Statistical Office, university staff statistics; DZHW calculations

D1.6 Total international and German academic staff, and international and German professors, by subject group, in 2019



Sources: Federal Statistical Office, university staff statistics; DZHW calculations

With regard to international professors, mathematics and natural sciences (22%) and engineering (16%) are of particular significance, as are the subject groups of law, economics and social sciences, and art and art history (18% each). In comparison to German professors, many more international professors are found in art and art history (German professors: 7%) and mathematics and natural sciences (German professors: 13%), but they are less likely to be represented in law, economics and social sciences (German professors: 31%) and engineering (German professors: 27%).

The distribution of international academic staff among all academic staff at universities follows the same pattern, especially in mathematics and natural sciences (20%) and engineering (18%), as well as in universities' central services (17%). At universities of applied sciences, the humanities account for a particularly high share (21%): as a subject group with a strong focus on foreign languages, they are taught by native speakers. International professors make up above-average proportions in art and art history at universities (19%) and at universities of applied sciences (7%).

Footnotes

1 While the number of professorships rose by 27% in Bavaria between 2009 and 2019, it increased by only 9% in Bremen.

2 Total number including 256 persons without information on the federal state.

2.1 Mobility trends, regions and countries of origin

In 2019[1], the four largest non-university research institutes (NURIs) employed around 14,100 salaried academics and researchers of foreign nationality.[2] Since 2010, their number has almost doubled (+107%). This indicates that the number of academic staff at NURIs is changing more rapidly than at universities. While the number of international academics and researchers at universities has risen by 13% since 2016, the increase at NURIs over the same period is 33%, up 8% on 2018 alone.

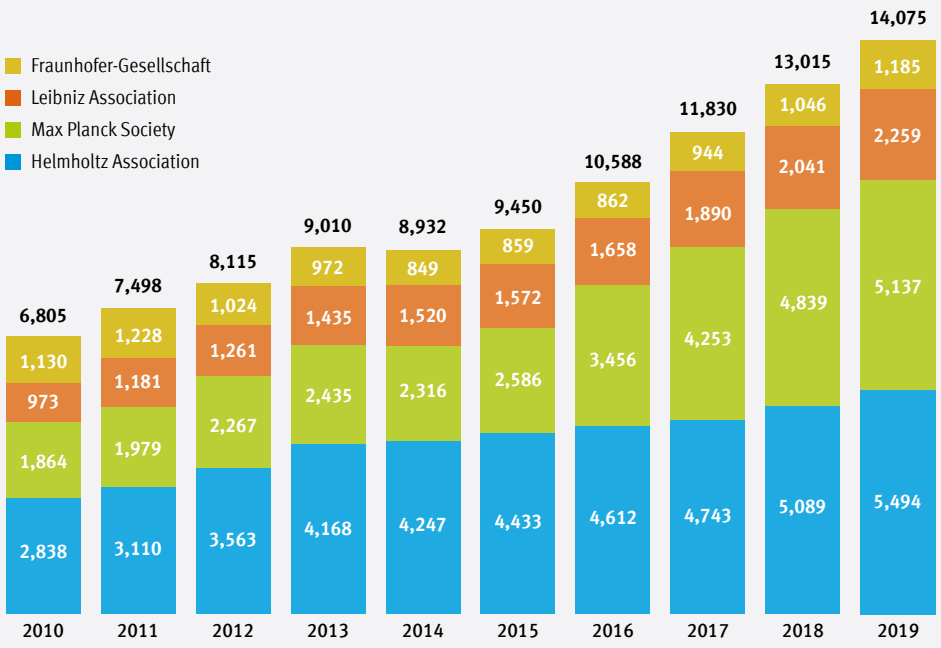
The largest increase was at the Max Planck Society, where the number of international academics and researchers shot up by 176% in nine years. This is partly due to the decision taken in 2015 to no longer finance doctoral candidates with scholarships but with fixed-term contracts. At the Helmholtz and Leibniz associations, there has also been a significant hike in international academic staff since 2010, growing by 94% and 132% respectively. The Fraunhofer-Gesellschaft is the only exception. In 2019, it did not quite reach the 2011 level (–3%), when it recorded its highest number of international academics and researchers to date. However, after a significant decline, this number has been increasing continuously again since 2015, rising by 13% from 2018 to 2019 alone.

> “The number of international academics and researchers at non-university research institutes has more than doubled since 2010.

The steady growth of the international academic staff at NURIs has led to the fact that, in 2019, about 28% of all academics and researchers came from abroad. In 2010, this figure was only 15%. The proportion of international academics and researchers currently at NURIs is almost twice as high as at universities (see p. 84/85). This is partly a consequence of the different subject profiles. The majority of NURIs – with the exception of the Fraunhofer-Gesellschaft – focus heavily on the highly international field of natural sciences. In these subject areas, international academic staff as a proportion of all those working in science and research, including universities, is above average at 19% (see p. 86/87). In addition, the excellent research conditions and lower language barriers – there are no teaching obligations and English is generally spoken in natural science laboratories – also contribute to the international attractiveness of NURIs.

Expressed as a share of all employed academics and researchers, the highest level of international academics and researchers is to be found at the institutes of the Max Planck Society, at around 51%. Approximately half of academics and researchers are therefore foreign nationals. As already described, this high figure is also the result of the temporary employment of all doctoral

D2.1 International academic staff at the four largest non-university research institutes, since 2010[1]



Source: Federal Statistical Office, statistics on non-university research institutes

Footnotes

1 The Federal Statistical Office's data on staff at non-university research institutes refer to reporting years (January-December) and not to academic years.

2 Data and comments relate exclusively to the four largest non-university German research institutes: Max Planck Society, Fraunhofer-Gesellschaft, Leibniz Association, Helmholtz Association.

3 In the official statistics on non-university research institutes, the origin of international staff is not given by more differentiated regions, but by continents.

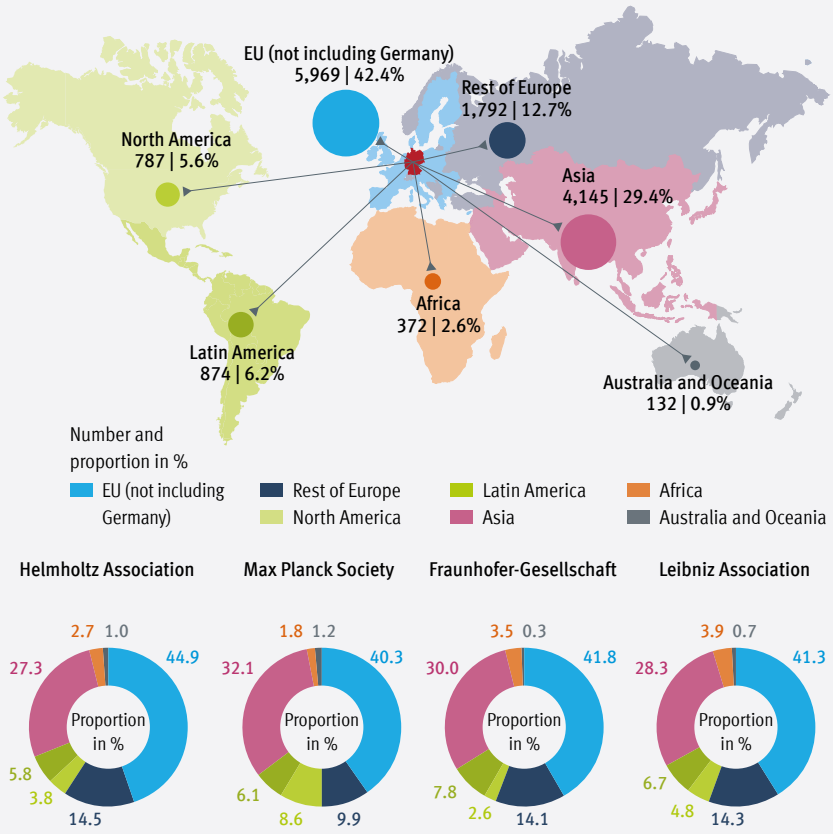
candidates. By contrast, only one in ten academics and researchers at the mostly engineering science-oriented Fraunhofer-Gesellschaft comes from abroad (11%). For the Helmholtz and Leibniz associations, this figure is around a quarter (27% and 24% respectively).

> “ 51% of academics and researchers at the Max Planck Society hold foreign citizenship.

International academic staff at NURIs mainly come from European countries. EU countries make up 42% of the foreign academics and researchers, and the remaining European countries 13%. Asia also accounts for a high percentage at 29%. The dominance of academics and researchers from European countries at NURIs corresponds to the origin of the international academic staff at the universities, with more than half of academics and researchers coming from Europe. There are only minor differences between the various NURIs. The institutes of the Helmholtz Association have the highest percentages of academics and researchers from European countries (59%), while most scientists from North America (9%) and Asia (32%) are at the Max Planck Society.

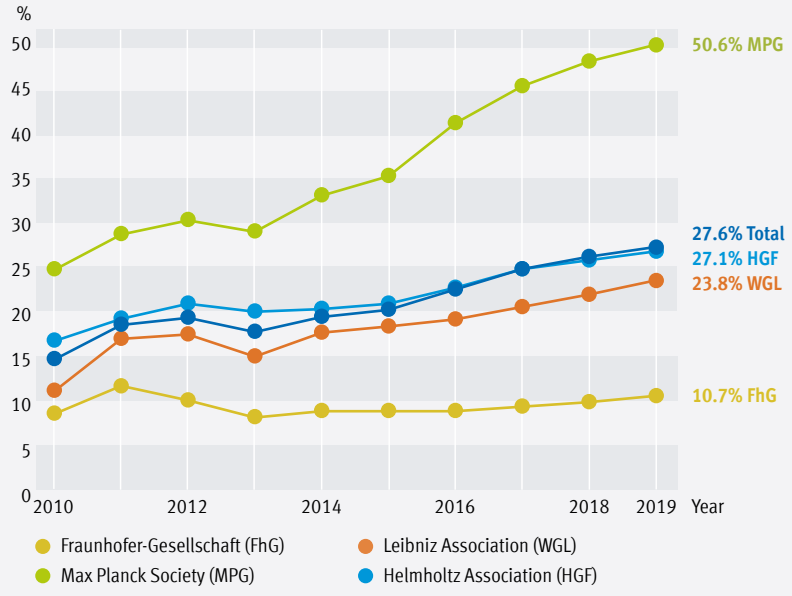
The key countries of origin in terms of numbers of academics and researchers working at NURIs in 2019 are China (1,300), Italy and India (1,200 each). Other major countries are Russia (around 700), France, Spain and the US (around 600 each).

D2.2 International academic staff at the four largest non-university research institutes, by region of origin, in 2019[3]



Sources: Federal Statistical Office, statistics on non-university research institutes; DZHW-calculations

D2.3 International academic staff as a proportion of all academic staff at the four largest non-university research institutes, since 2010



Sources: Federal Statistical Office, statistics on non-university research institutes; DZHW-calculations

2.2 Subject groups and qualifications

Accounting for a proportion of 69%, the majority of international academic staff at non-university research institutes (NURIs) belong to the mathematics and natural sciences subject group. Most are physicists or biologists. 15% of international academics and researchers work in engineering, 8% in the social sciences and humanities, and 7% in medicine. The preponderance of international academic staff working in the natural sciences is in line with the general focus of the NURIs. Only the institutes of the Fraunhofer-Gesellschaft are primarily oriented towards engineering.

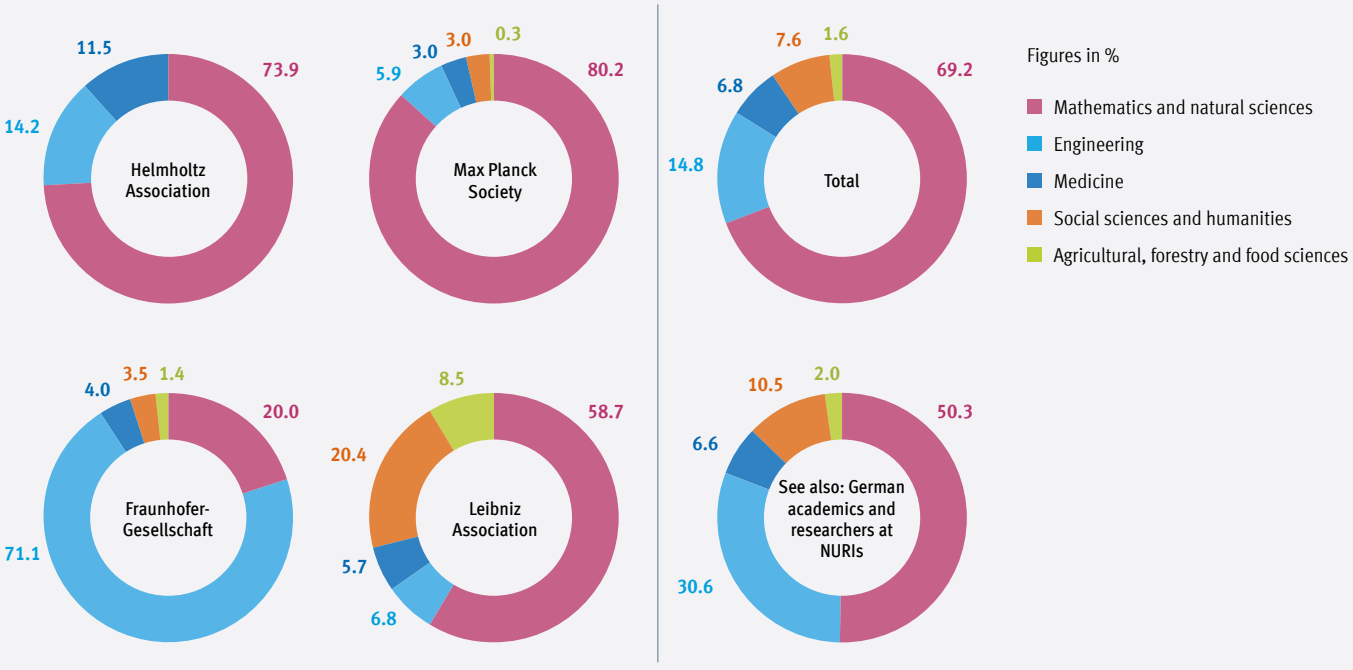
The share of international academics and researchers working in mathematics and natural sciences is much higher than that of German staff (69% vs 50%), whereas it is much lower in engineering (15% vs 31%). At the level of the individual research institutes, however, these differences even out as they are mainly due to the lower proportion of foreign academics and researchers employed at the Fraunhofer-Gesellschaft (p. 88/89). It is only at the Helmholtz and Leibniz associations that there is a slightly higher percentage of international academics and researchers than German academics and researchers working in the field of mathematics and the natural sciences.

> “9% of international academics and researchers at the Leibniz Association are in leadership roles.

The strong interest of international academics and researchers in scientific research at NURIs is not only shown by the large number of people working in this field but also by the fact that these disciplines account for the highest percentage of the total staff (34%), compared to other subjects. Only medicine presents a similarly high figure of 28%. The relatively low share of foreign academics and researchers in engineering (15%) is quite surprising in view of the high number of international bachelor’s, master’s and doctoral candidates on engineering programmes at German universities.

International academic staff at NURIs are highly qualified, with an average of around 49% holding doctorates. At the institutes of the Fraunhofer-Gesellschaft, however, the proportion is much lower (25%), although only 23% of German academics and researchers there hold a doctorate. At the other three NURIs, the shares of international and German academics and researchers with doctorates follow a similar pattern. However, there is a higher proportion of doctoral graduates among international academics and researchers at the Max Planck Society (53% vs 44%). There are hardly any differences in this respect at the Helmholtz and Leibniz associations.

D2.4 International academic staff at the four largest non-university research institutes, by subject group, in 2019



Sources: Federal Statistical Office, statistics on non-university research institutes; DZHW calculations

At NURIs, 4% of international academic staff are employed as heads of research groups or heads of departments. 27% are employees with a doctorate and 69% are other academics and researchers. In comparison, the proportion of German academic staff is higher both for research group leaders and heads of departments (7%) and for other academics and researchers (77%), while the percentage of employees in posts requiring a doctorate is lower (16%). This situation is similar at all research institutes. It is notable that the Leibniz Association has an above-average proportion of international research group leaders and heads of department (9%), whereas the share is particularly low for the Fraunhofer-Gesellschaft (1%). In both cases, however, these figures are in line with the corresponding percentages of German academics and researchers (17% and 3% respectively).

> “Around 50% of international academic staff at NURIs hold a doctorate.

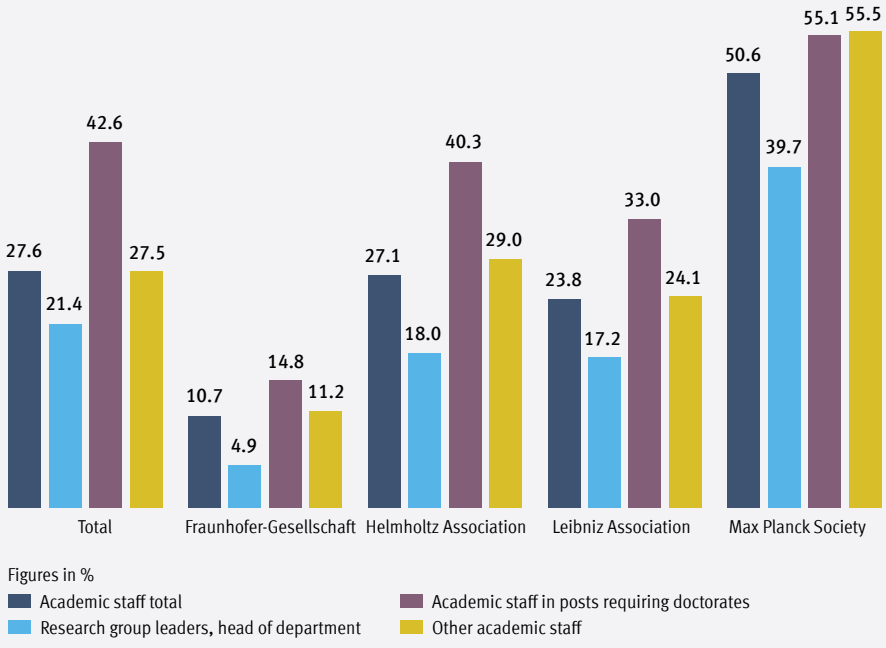
Looking at the relative proportions of international academic staff in all staff groups, it becomes clear that one in five (21%) research group leaders or heads of department comes from abroad. Moreover, 43% of the staff in posts requiring a doctorate and 28% of the other academics and researchers are foreign nationals. At the institutes of the Max Planck Society, these figures are higher for all staff groups: 40% of research group leaders and heads of department, 55% of employees in posts requiring doctorates and 56% of the other academics and researchers come from abroad. At the institutes of the Fraunhofer-Gesellschaft, by contrast, only 5% of the research group leaders and heads of department, 15% of the employees in posts requiring a doctorate and 11% of the other academics and researchers are foreign nationals.

D2.5 International academic staff with doctorates as a proportion of all academic staff at the four largest non-university research institutes , in 2019

	Proportion in %
Max Planck Society	53.0
Helmholtz Association	50.2
Leibniz Association	46.5
Fraunhofer-Gesellschaft	24.9
Total	48.5
See also: German academics and researchers with doctorates at NURIs	39.6

Sources: Federal Statistical Office, statistics on non-university research institutes; DZHW calculations

D2.6 International academic staff as a proportion of all academic staff at the four largest non-university research institutes, by employment status, in 2019



Sources: Federal Statistical Office, statistics on non-university research institutes; DZHW calculations

3 International guest researchers in Germany

3.1 Mobility trends, funding organisations and scholarship groups

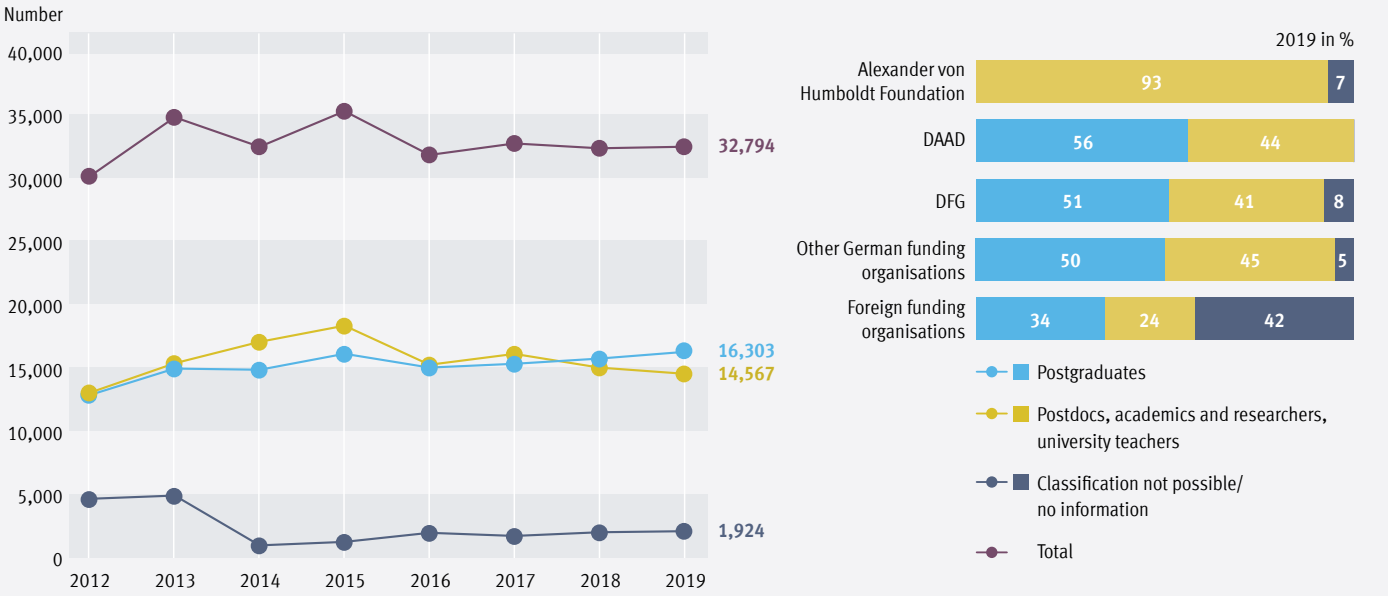
In 2019, domestic and foreign organisations funded around 32,800 visits by international guest researchers to Germany.[1, 2] Guest researchers are foreign nationals who visit Germany for a limited period without being employed and are active in teaching and research at universities or other research institutes. Although the data collected on mobility funding is not a complete analysis for German funding organisations, it covers most funded visits by international guest researchers.[3] With regard to funding provided by foreign organisations, however, the data have only ever been able to represent a section of the funding activities limited to a few countries and the Marie Skłodowska-Curie Actions of the EU.

The number of funded visits by international guest researchers has changed little since last year. Since 2016, no major change in the number of funded visits has been discernible, ranging between 32,000 and 33,000 funded visits over the past three years. As before, three large funding organisations are the primary source of support for the vast majority of guest researchers' visits to Germany: Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), DAAD (German Academic Exchange Service) and the Alexander von Humboldt Foundation. The DFG alone funds 47% of all guest research visits, the DAAD 38% and the Alexander von Humboldt Foundation 7%. Together they contribute to the funding of 92% of all visits.[4] However, while the DFG expanded its funding activities by around 500 visits (3%) compared to 2018, the DAAD funded 600 (4%) fewer.

> "Between 32,000 and 33,000 visits by international guest researchers in Germany have been funded every year since 2016.

A large number of other smaller German funding organisations supported around 5% of the visits of international guest researchers in 2019. Even if the scope of the funding activities of these organisations does not appear large, their contribution to international mobility should not be underestimated. On the one hand, their activities make it clear that many institutes support promoting researchers' international mobility. On the other hand, these smaller institutions also often focus on specific areas of teaching and research, which in turn creates a strong incentive for internationalisation. The number of visits by international guest researchers funded by these organisations has increased by 3% from 2018 to 2019. A large number of organisations have expanded their funding activities. The Hans Böckler Foundation and Baden-Württemberg Foundation have been particularly notable but the German Federal Environmental Foundation, the Einstein Foundation Berlin and Klassik Stiftung Weimar have also expanded their activities. Other institutions have reduced their funding somewhat, such as the Konrad Adenauer Foundation, the Herzog August Bibliothek Wolfenbüttel, the Friedrich Naumann Foundation and the Heinrich Böll Foundation.

D3.1 International guest researchers in Germany, by type of university and by scholarship holder group, since 2012[1, 2]



Sources: Responses from funding organisations; DZHW survey; DZHW calculations

Foreign institutions' funding activities included in the survey cover around 3% of the visits of international guest researchers presented here. Compared to the previous year, they have funded around 100 more visits (12%). It is particularly striking that the number of visits supported by Marie Skłodowska-Curie Actions increased from 285 to 355 within one year.

44% of the international guest researchers who received funding hold doctorates (this includes professors and experienced researchers such as heads of research groups). A further 50% of the funded visits were undertaken by doctoral students and other postgraduates. This distribution of the funding activities among the different status groups of academics and researchers and scholars has remained essentially unchanged for over five years, making it clear that the funding activities of the various organisations are based on a long-term strategy.

Sponsorship provided by the Alexander von Humboldt Foundation goes almost exclusively (93%) to experienced academics and researchers with doctorates at German universities and research institutes. In contrast, the DFG and the DAAD each support, in similar proportions, visits by guest researchers with doctorates (DFG: 41%, DAAD: 44%) and postgraduates (DFG: 51%, DAAD: 56%). Smaller German organisations fund up to 50% of visits by international postgraduates.

Footnotes

1 The figures on foreign guest researchers in Germany on p. 92–95 do not contain any information on the major non-university research institutes: Max Planck Society, Fraunhofer-Gesellschaft, Leibniz Association, Helmholtz Association. More information can be found on p. 96/97.

2 Not including Erasmus visits to Germany by international academics and researchers.

3 Missing information includes university funding of visits by international guest researchers.

4 It should be noted here that the majority of DAAD funding are short-term grants for just a few days (e.g. attending conferences), while visits funded by the DFG and AvH generally last considerably longer.

5 Estimated.

6 Information on applicants for a residence grant in Germany only.

D3.2 International guest researchers in Germany, by funding organisations, in 2019[2]

Funding organisation	Number
Key German funding organisations	
German Research Foundation (DFG)	15,506
German Academic Exchange Service (DAAD)	12,546
Alexander von Humboldt Foundation	2,371
Other German funding organisations	
Konrad Adenauer Foundation	240
Catholic Academic Exchange Service	226
Gerda Henkel Foundation[5]	160
Hanns Seidel Foundation	94
Baden-Württemberg Foundation	94
Hans Böckler Foundation	74
Boehringer Ingelheim Fonds	68
Friedrich Ebert Foundation	63
German Federal Environmental Foundation	59
Akademie Schloss Solitude	54
Einstein Foundation Berlin	49
Herzog August Bibliothek Wolfenbüttel	42
Schneider-Sasakawa-Fonds – WWU Münster	37
Evangelisches Studienwerk	35
Fritz Thyssen Foundation	29
Friedrich Naumann Foundation	28
Rosa Luxemburg Foundation	23
German National Committee of the Lutheran World Federation	20
Study Foundation of the Berlin House of Representatives	18
Stiftung Charité	12
Klassik Stiftung Weimar	10
Zeit-Stiftung Ebelin and Gerd Bucerius	8
DECHEMA Foundation Research Institute	5
Heinrich Böll Foundation	4
Heinrich Hertz Foundation	4
Alfred Toepfer Stiftung F.V.S.	3
Foreign funding organisations	
Japan Society for the Promotion of Science	367
Marie Skłodowska-Curie Actions	355
Swiss National Science Foundation[6]	136
Fulbright Commission	37
FWF Austrian Science Fund	8
Total	**32,785**

Sources: Responses from funding organisations; DZHW survey; DZHW calculations

3.2 Regions and countries of origin and subject groups

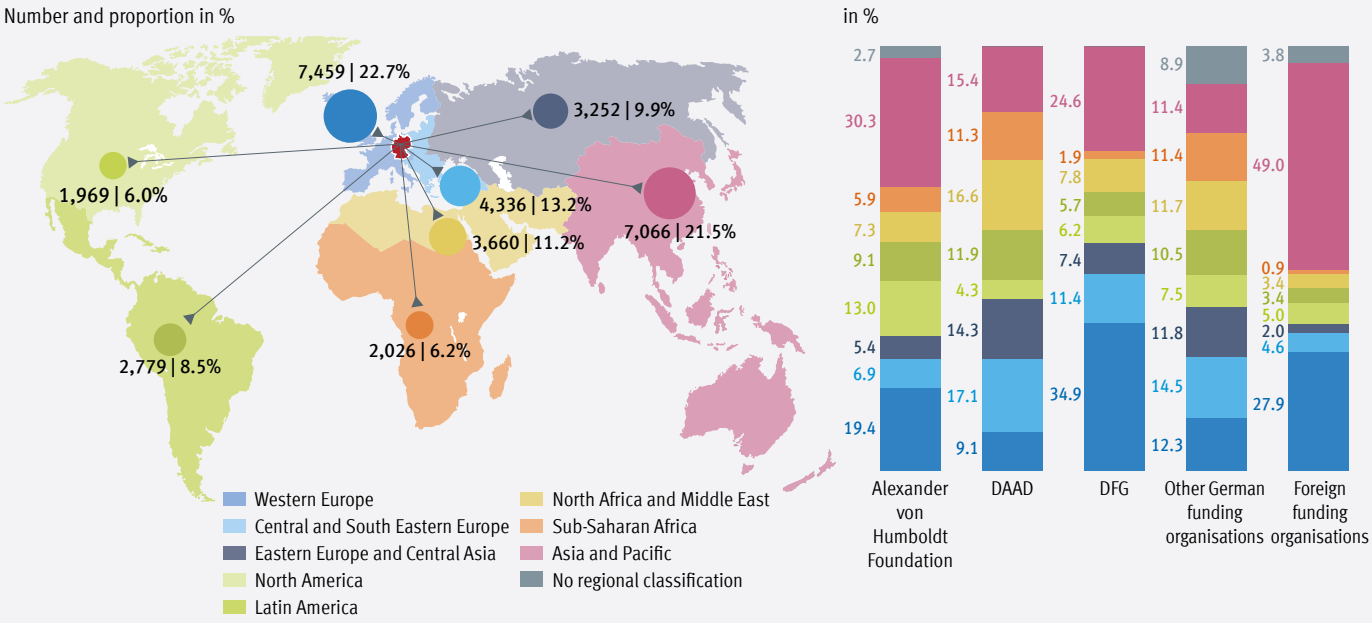
Western Europe and Asia and Pacific are the key regions of origin for international guest researchers, whose visits to Germany were supported by domestic and foreign funding organisations. 22% and 20% respectively of researchers receiving funding came from these regions. Other major regions of origin are Central and South Eastern Europe (13%), North Africa and Middle East (11%) and Eastern Europe and Central Asia (10%). The percentages for Latin America (9%), North America and Sub-Saharan Africa (6% each) are lower. The frequency of visits by academics and researchers from Western Europe and the Asia-Pacific regions for research and teaching purposes in Germany corresponds to the preponderance of these regions of origin among international academics and researchers employed at German universities or non-university research institutes (see p. 84/85 and 88/89). The mobility flows of Western European and Asian guest researchers to Germany are not only a consequence of demographics – in other words, the high number of university-trained academics and researchers in these regions – but also the result of many years of economic and academic collaboration, including cooperative relationships between German universities and research institutes. There has been hardly any change in the respective proportions of the various regions of origin since last year.

> “With over 2,000 visits from each country, the number of Chinese and Indian academics and researchers in Germany is unprecedented.

The various funding organisations are distinguished by their different regional emphases.[1] At the DFG, the percentages of funded guest researchers from Western Europe (35%) and Asia and Pacific (25%) are particularly high. Moreover, the Alexander von Humboldt Foundation not only funds a high share of academics and researchers from Asia and Pacific (30%) but from North America as well (13%). By contrast, funding from the DAAD and the smaller German funding organisations is more evenly spread across the various regions of origin.

The four key countries of origin for international guest researchers in Germany are China, India, Italy and Russia. Between 1,800 and 2,200 funded academics and researchers come from these countries. The number of guest researchers from China (+6%) and India (+8%) has continued to rise since 2018, representing the highest-ever levels of funding for visits to Germany by academics from these countries. In contrast to this, the number of funded visits for Russian academics and researchers has dropped by 6%. Other major countries of origin are the US, Poland, Iran and Spain. Levels of funding for these countries are largely unchanged for the US and Iran, and have risen slightly for Poland and Spain.

D3.3 International guest researchers in Germany, by region of origin and funding organisations, in 2019[1, 2]



Sources: Responses from funding organisations; DZHW survey; DZHW calculations

45% of international guest researchers are found in mathematics and natural sciences, making them the largest single subject group. The humanities (15%), engineering (14%) and law, economics and social sciences (10%) follow some way behind. Medicine (7%), agricultural, forestry and food sciences (3%), and art and art history (2%) are less significant. The dominance of the natural sciences among international guest researchers corresponds to the importance of this subject area among salaried foreign academics and researchers, both at German universities and at non-university research institutes. The only unusual feature is the comparatively high proportion of guest researchers representing humanities subjects, which is above average.

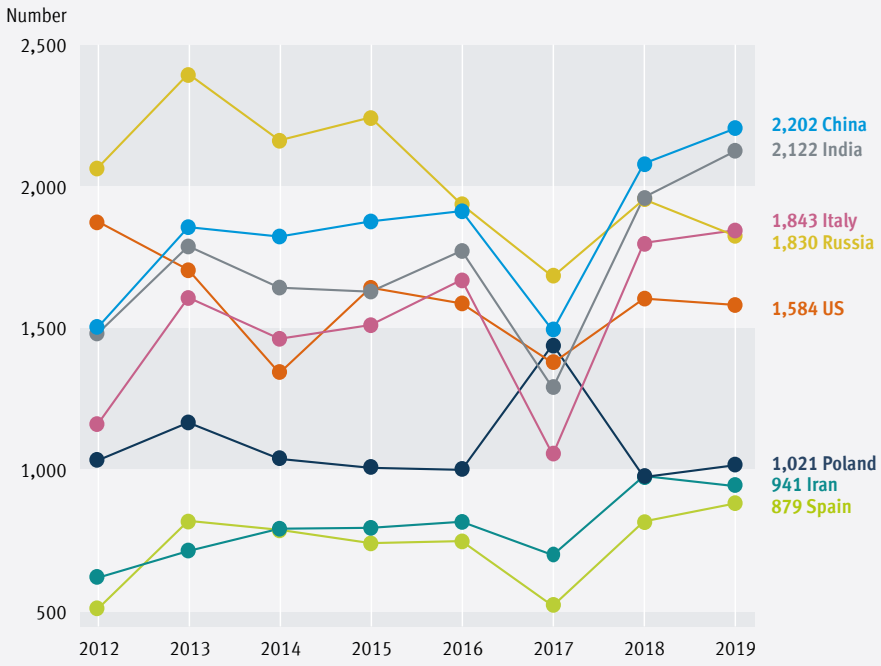
There are clear differences between the various funding organisations with regard to the specialist areas of the academics and researchers they support. At the DFG and the Alexander von Humboldt Foundation, the share of academics and researchers in the natural sciences is particularly high at 63% and 48% respectively. By contrast, the smaller German funding organisations are more likely to support humanities scholars (36%) and legal, economic and social researchers (21%). At 18%, the DAAD funds the highest proportion of engineering academics and researchers.

Footnotes

1 With the exception of EU funding under the Marie Skłodowska-Curie Actions, foreign funding organisations usually support visits to Germany by guest researchers from their respective countries of location.

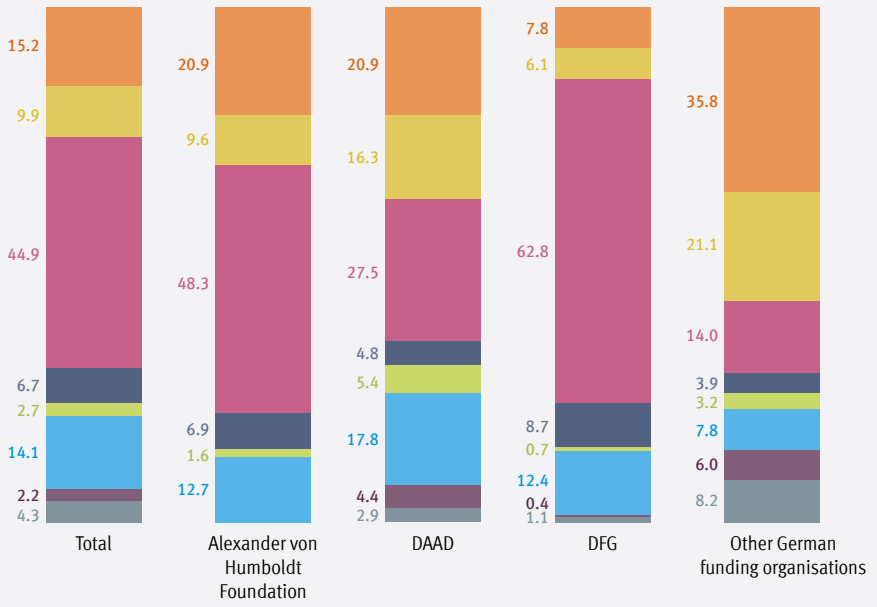
2 Total funded international guest researchers in Germany: 32,794 (including 65 guest researchers who cannot be assigned to a region of origin).

D3.4 International guest researchers in Germany, by key countries of origin, since 2012



Sources: Responses from funding organisations; DZHW survey; DZHW calculations

D3.5 International guest researchers in Germany, by funding organisation and subject group, in 2019



Sources: Responses from funding organisations; DZHW survey; DZHW calculations

3.3 International guest researchers at non-university research institutes

Internationalisation processes at the non-university research institutes (NURIs) are not limited to the employment of foreign researchers and scholars but also include temporary research visits by guest researchers from other countries. Some of these visits are funded by other institutions outside NURIs but another significant proportion of these temporary visits is made possible by NURIs themselves, who award fellowships or other funding. Data on international guest researchers whose visits are financed by NURIs have improved considerably in recent years. The Helmholtz Association, the Max Planck Society and the Leibniz Association now have robust data on visits by international guest researchers to their institutes or on the projects they undertake. Only the Fraunhofer-Gesellschaft has not yet provided information of this kind.

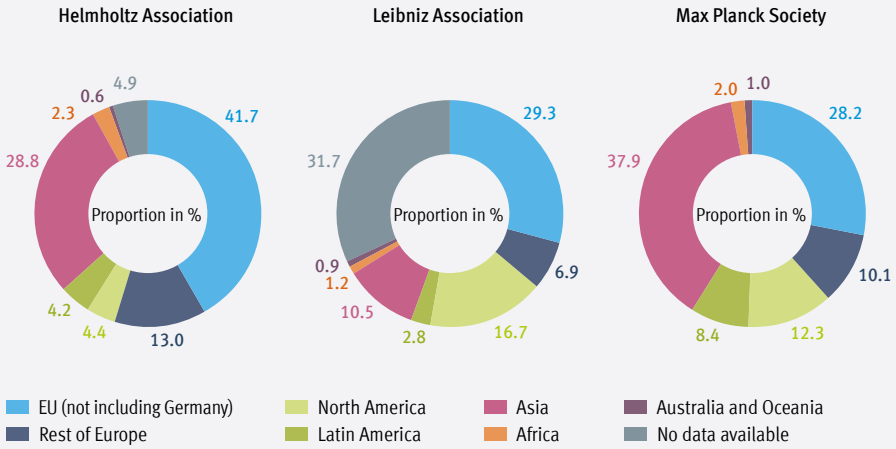
> “In 2019, non-university research institutes funded 11,300 international guest researchers’ visits to Germany.

The Max Planck Society and the Helmholtz and Leibniz associations together funded around 11,300 visits for international guest researchers to Germany in 2019.That represents an increase of 900 guest researchers (+8%) over last year.[1] The Helmholtz Association accounts for roughly 4,600 guest researchers, with 5,300 for the Leibniz Association and around 1,500 for the Max Planck Society. With regard to full-time academic staff, this means that one in seven full-time academic staff at the Max Planck Society in 2019 was a guest researcher supported by the institute. The corresponding figure for the Helmholtz Association was one in four,[2] and the ratio at the Leibniz Association was even one in two.

In terms of the regional origins of their international guest researchers, each of the three research institutes displays different characteristics. The Helmholtz Association mainly sponsors researchers from European countries. In 2019, a total of 42% of the guest researchers at the Helmholtz Association came from EU countries and 13% from other European countries. Academics and researchers from Asia also play a major role, accounting for 29% of all Helmholtz Association funding. Academics and researchers from Europe and Asia together account for 84% of all guests. At the head of the list of countries for the Helmholtz Association is China, whose academics and researchers constitute no less than 15% of all visits. Russia comes in second with 8%, followed by Sweden (6%), then Italy and France (5% each).

In the case of the Leibniz Association, most guest researchers it sponsors come from European countries, with 29% from EU countries and 7% from other European countries. However, it also funds North American researchers more often than the other NURIs, who make up 17% of the total. The number of researchers from Asia receiving funding is very high, accounting for 32% of the total. In terms of the countries of origin of the academics and researchers funded by the Leibniz Association, the US leads by a wide margin (15%), followed by France and the United Kingdom (6% each), Italy (5%) and Switzerland (3%).

D3.6 International guest researchers whose visits were funded by the Max Planck Society, Helmholtz or Leibniz Associations, by region of origin, in 2019[1]



Sources: Responses from non-university research institutes; DZHW survey; DZHW calculations

Footnotes

1 No data on guest researchers funded by non-university research institutes prior to 2018 are shown, as the way in which the data are recorded has changed.

2 When evaluating these data, it should be noted that, since 2015, the Max Planck Society has given doctoral candidates (including international doctoral candidates) temporary contracts so they are no longer financed by scholarships.

D3.7 International guest researchers whose visits were funded by the Max Planck Society, Helmholtz or Leibniz Associations, by country of origin, in 2019[1]

Helmholtz Association		
Countries of origin	Number	in %
China	668	14.6
Russia	362	7.9
Sweden	248	5.4
Italy	242	5.3
France	217	4.7
Total	**4,588**	**100.0**

Leibniz Association		
Countries of origin	Number	in %
US	789	14.9
France	337	6.4
United Kingdom	333	6.3
Italy	179	3.4
Switzerland	142	2.7
Total	**5,285**	**100.0**

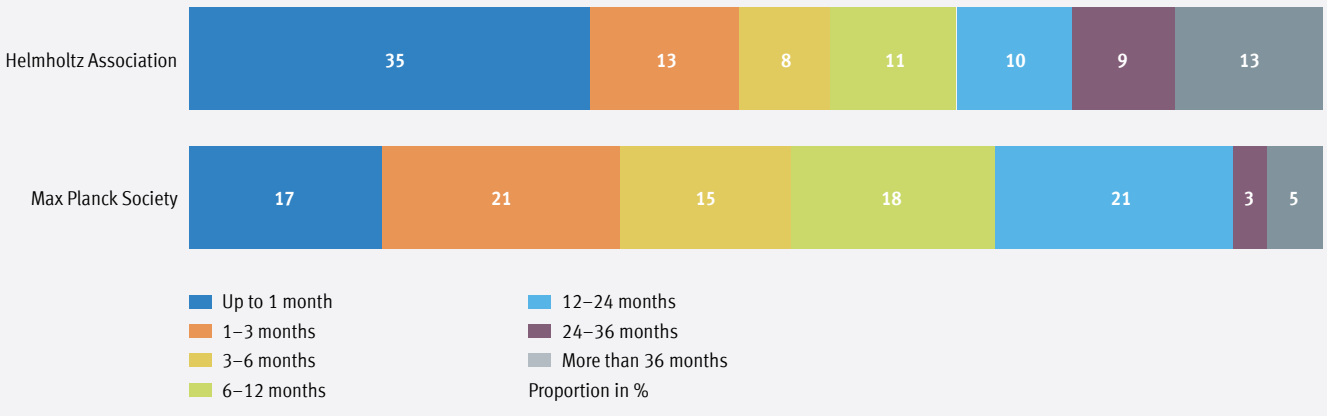
Max Planck Society		
Countries of origin	Number	in %
China	222	15.2
US	150	10.3
India	147	10.1
Italy	97	6.7
Russia	68	4.7
Total	**1,458**	**100.0**

Sources: Responses from non-university research institutes; DZHW survey; DZHW calculations

The Max Planck Society also frequently sponsors temporary visits by guest researchers from European countries. 28% come from EU countries and 10% from other European countries. Funding academics and researchers from Asia is equally significant, however – they make up 38% of the total. 12% of guest researchers come from North America and 8% from Latin America. China is the leading country of origin with 15% of all guest academics and researchers, followed by India and the US with 10% each. Italy (7%) and Russia (5%) are other major countries of origin.

Data are available on visit duration for the Max Planck Society and the Helmholtz Association as well. These show that shorter visits lasting up to six months figure prominently. They make up 53% for the Max Planck Society and 56% for the Helmholtz Association, where short visits of one month or less already account for one third of all funding. Visits of more than two years are completed by 8% of the guest researchers at the Max Planck Society and 22% at the Helmholtz Association.

D3.8 International guest researchers whose visits were funded by the Max Planck Society or the Helmholtz Association, by duration of visit, in 2019



Sources: Responses from non-university research institutes; DZHW survey; DZHW calculations

3.4 Erasmus guest lecturers

The Erasmus+ programme of the European Union also supports temporary visits abroad for guest lecturers. These guest lectureships in Europe can be between 2 and 60 days in length. The funding includes teaching visits by academic staff, professors and participants from business. Participants in this programme do not necessarily have to be citizens of the country of assignment. Foreign staff at universities in the sending country can also participate in the programme. It is therefore possible that some Erasmus guest lecturers in Germany may be German citizens, although this percentage is likely to be very small.

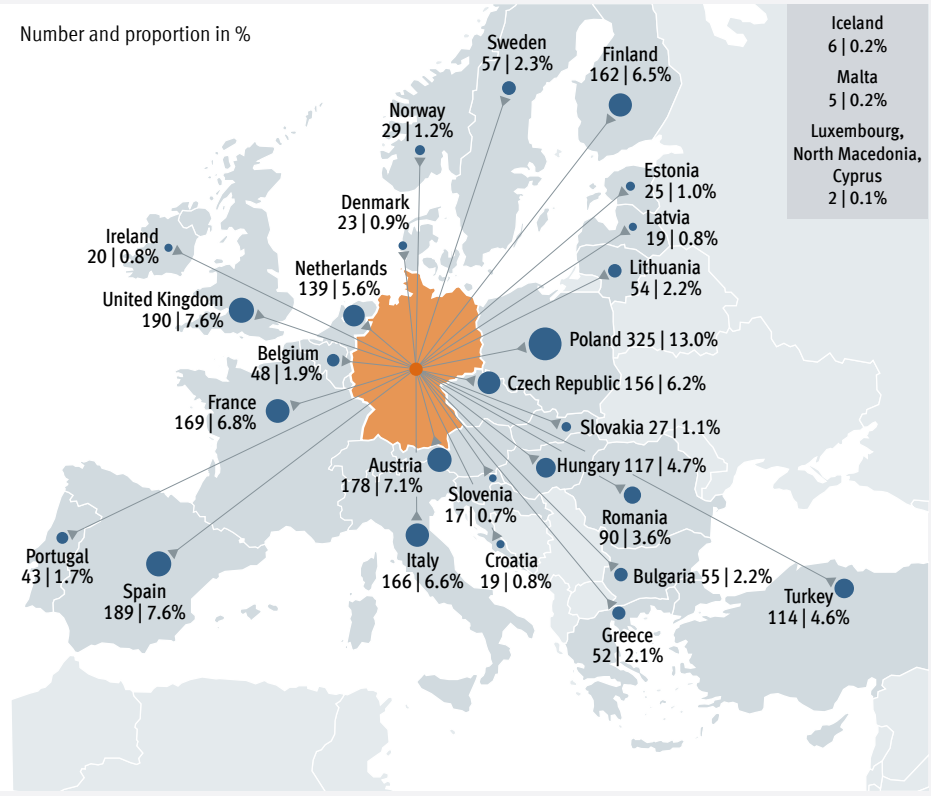
> “Poland is by far the most important country of origin for Erasmus guest lecturers in Germany.

In the 2019 Erasmus year[1], 2,500 Erasmus guest lecturers came to Germany on teaching visits. This amounts to 8% less than last year. Over the last five years, the number of guest lecturers in Germany has remained relatively constant, ranging between 2,500 and 2,800.

The largest group of Erasmus guest lecturers (30%) come from countries in Central and Eastern Europe. 23% come from Western European countries and 16% from Southern European countries. The proportion of guest lecturers from South Eastern Europe is 13%, while guest lecturers from Northern Europe make up 11%. 7% come from Central Western Europe. There has been no significant change in the size or respective shares of the groups from these regions over the past five years. Poland is the key country of origin for Erasmus lecturers in Germany, accounting for 13% of all lecturers alone. The United Kingdom and Spain (8% each) come in second and third, some way behind. Austria, France, Italy and Finland (7% each) also continue to play a major role. While the number of participants from Poland, the United Kingdom, Spain and Austria has been subject to significant fluctuations over the last five years, the figures for the other major countries have remained essentially constant.

The largest group of foreign Erasmus guest lecturers in Germany are in the arts and humanities, accounting for 33%.[2] 16% belong to the engineering, manufacturing and construction subject group,

D3.9 Erasmus guest lecturers in Germany, by region and country of origin, in 2019[1]



Region of origin	Number	in %
Central and Eastern Europe	759	30.4
Western Europe	566	22.6
Southern Europe	403	16.1
South Eastern Europe	315	12.6
Northern Europe	277	11.1
Central and Western Europe	180	7.2
Total	**2,500**	**100.0**

Source: DAAD, Erasmus statistics

Footnotes

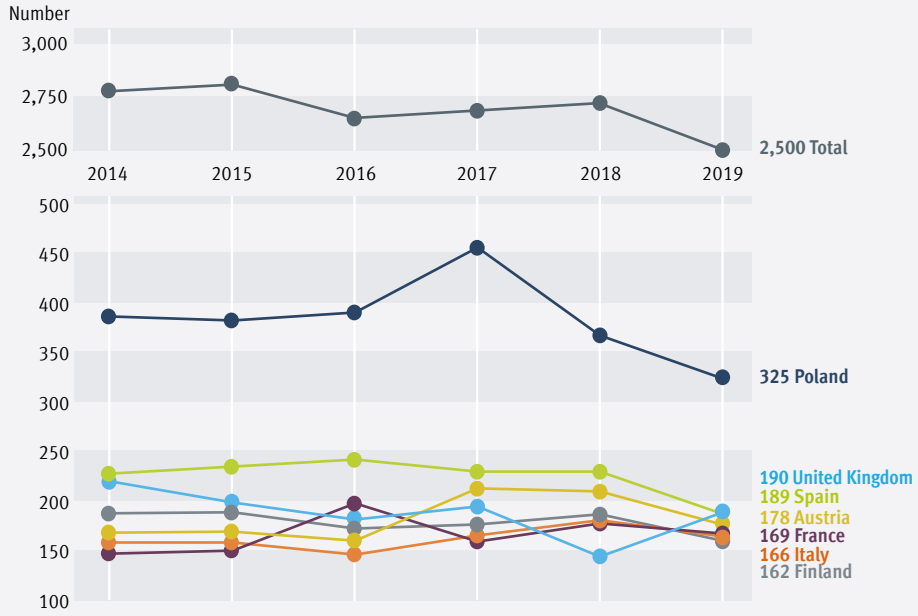
1 Erasmus statistics to 2014: the academic year begins in the winter semester and ends in the summer semester of the following year. 2014 = WS 2013/14 + SS 2014.
New Erasmus statistics from 2015: the academic year begins on 1 June of the preceding year and ends on 31 May of the following year. 2019 = 01/06/2018 to 31/05/2020.

2 Data on Erasmus guest lecturers by subject group are only available using the ISCED system.

while a further 15% represent economics, administration and law. Social sciences, journalism and information account for 9%, education 8%, and health and welfare 6%. Natural sciences, mathematics and statistics (6%), information and communication technologies (4%), services (3%) and agriculture, forestry, fisheries and veterinary science (1%) also play a minor role. Compared to German Erasmus guest lecturers who go abroad for a temporary visit, there are no significant differences in the distribution of subject groups (see p. 110/111).

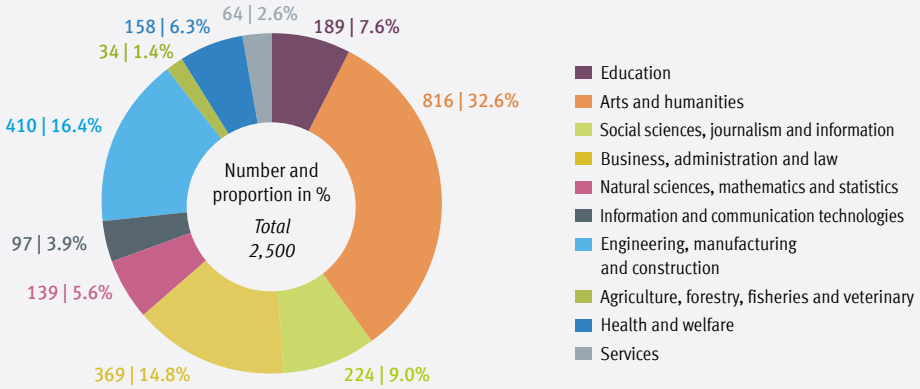
Although Erasmus guest lectureships can last up to two months, lecturers in Germany only stay for an average of 4.9 days. This figure is the same as last year. There are differences between the individual countries of origin. Erasmus guest lecturers from Luxembourg and Slovenia spent an average of between ten and twelve days in Germany. By contrast, guest lecturers from Cyprus, Austria, Portugal and the Netherlands spent an average of only three to four days in Germany.

D3.10 Erasmus guest lecturers in Germany, by key countries of origin, since 2014



Source: DAAD, Erasmus statistics

D3.11 Erasmus guest lecturers in Germany, by subject group, in 2019[2]



Source: DAAD, Erasmus statistics

D3.12 Erasmus guest lecturers in Germany, by countries of origin and average duration of visit, in 2019

Country of origin	Average duration in days: Days
Luxembourg	11.5
Slovenia	9.6
Sweden	6.5
Romania	5.9
Turkey	5.7
Iceland	5.5
Greece	5.5
Spain	5.5
Hungary	5.4
United Kingdom	5.3
Bulgaria	5.3

Country of origin	Average duration in days: Days
Czech Republic	5.2
Estonia	5.2
Italy	5.1
North Macedonia	5.0
Poland	4.9
Belgium	4.8
Croatia	4.8
Denmark	4.8
Finland	4.7
France	4.6
Ireland	4.6

Country of origin	Average duration in days: Days
Norway	4.5
Slovakia	4.4
Malta	4.4
Latvia	4.2
Lithuania	4.2
Portugal	3.9
Austria	3.7
Netherlands	3.5
Cyprus	2.5
Total	**4.9**

Source: DAAD, Erasmus statistics

1.1 Salaried academic staff

Only very few countries currently record the number, origin and status of international academics employed at their universities. Data of this kind are presently available for the United Kingdom, the Netherlands, Austria and Switzerland. Data are missing for countries such as Sweden, France and Australia, and also Spain and Canada, where it can be assumed that there are large numbers of German academics and researchers (see p. 102/103). Moreover, there are also considerable differences in how the countries listed above collect data.[1]

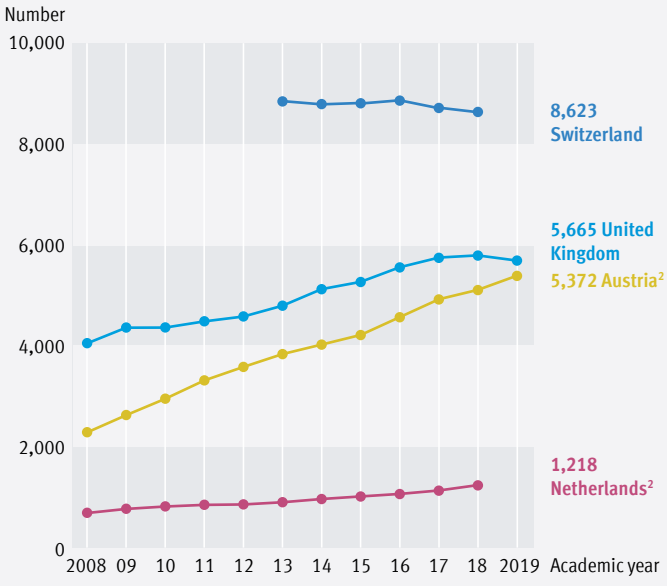
Many factors determine whether the international academics and researchers working in a particular country are many or few in number. These factors include the size, attractiveness and structure of the academic and higher education systems; access and employment opportunities, including the development of academic labour markets; and cultural and linguistic concerns. In the countries covered here, most German academics and researchers are employed at universities in neighbouring Switzerland, with around 8,600 in 2018. The vast majority (88%) are employed at universities in the German-speaking cantons. The United Kingdom comes second, with 5,700 German academics and researchers (2019). The figure for universities in Austria is not much lower, with around 5,400 German academics and researchers (2019). Direct proximity and a common language are likely to be important factors in Austria's attractiveness. Around 1,200 German academics and researchers were working at universities in the Netherlands in 2018.

> “ Around 8,600 German professors teach at Swiss universities.

While the number of German academics and researchers at Swiss universities fluctuated slightly between 2013 and 2018, albeit with a slight decline from 2016 onwards, there were significant increases in Austria (+41%) and the Netherlands (+38%) during this period. The number of German academics and researchers in the United Kingdom rose by 21% from 2013 to 2018. This figure decreased for the first time in 2019, falling by 2%. This may be an early consequence of the United Kingdom leaving the European Union.

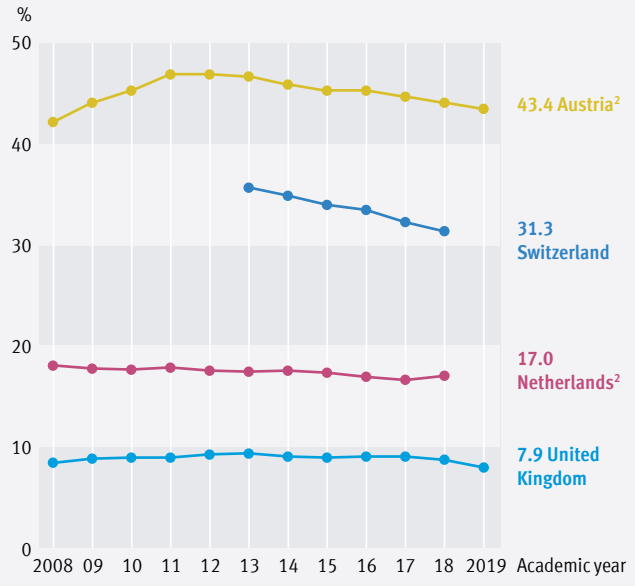
In addition to the number of German academics and researchers at universities in other countries, their proportion of all international academics and researchers is also an informative indicator of their success in academic labour markets. At 43%, German academics and researchers make up the largest group of international academics and researchers at Austrian universities. They represent 13% of all academics and researchers at these institutions. However, they have dropped 3 percentage points as a share of international academics and researchers since 2013. In Switzerland, too, they constitute a substantial proportion (31%), although this has also declined since 2013, dropping 4 percentage points. As in Austria, they account for 13% of all academics and researchers at Swiss universities. At Dutch universities, 17% of international academics and researchers are of German origin. In the United Kingdom, that figure is 8%.

E1.1 German academic staff in universities in selected host countries, since 2008



Sources: Data from respective statistical offices

E1.2 German international academic staff as a proportion of all international academic staff at universities in selected host countries, since 2008



Sources: Data from respective statistical offices

The number of German professors abroad aligns with the numbers for German academics and researchers. In 2018, Switzerland led the field with 1,291, followed by Austria with 827 (2019 figures) and the United Kingdom with 820 German professors (2018 figures). 188 German professors taught and conducted at Dutch universities (2018). In all the countries considered here, the number of professors has increased since 2013. The number of German professors has shot up particularly in Austria (+51%) and the United Kingdom (+36%). In the Netherlands the figure is +29% and in Switzerland +15%.

> “ The number of German professors in Austria shot up by 51% between 2013 and 2019.

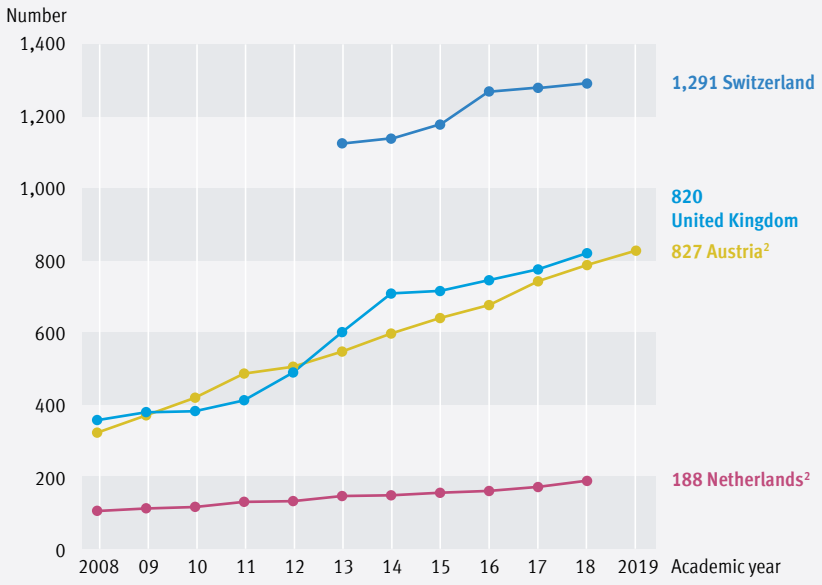
The proportion of German professors also exceeds that of German academics and researchers in the countries named above. Professorships advertised there are evidently very attractive to German academics and researchers, who can hold their own against international competition. At 71%, German professors make up the highest share of all international professors in Austria. In Switzerland, they account for 46% of all international professors. Figures for the Netherlands (29%) and the United Kingdom (15%) are lower. These percentages have barely changed over the last five years.

Footnotes

1 Some of the data are only available for universities but not for other types of universities; there are also differences in how academics and researchers are defined.

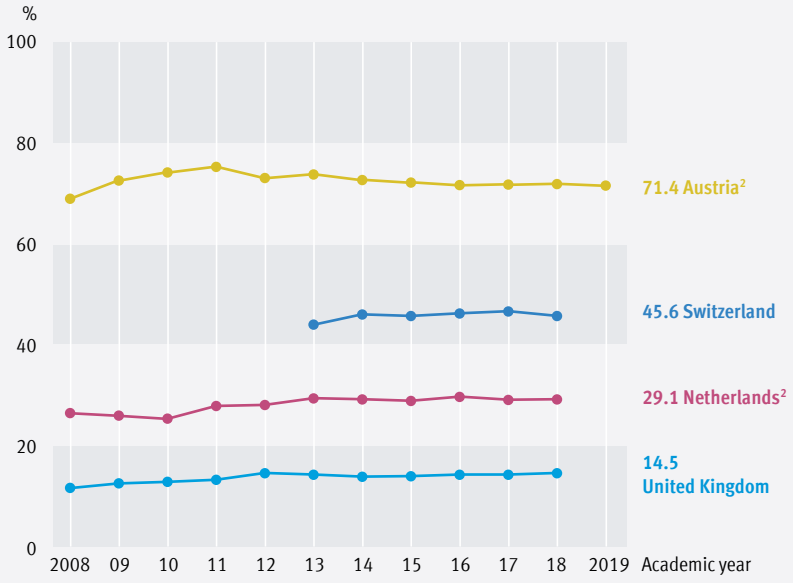
2 Data from the Netherlands and Austria refer only to universities.

E1.3 German professors in universities of selected host countries, since 2008



Sources: Data from respective statistical offices

E1.4 German professors as a proportion of all international professors in universities in selected host countries, since 2008



Sources: Data from respective statistical offices

1.2 Doctoral candidates

In 2018[1], 13,700 German doctoral candidates were recorded at foreign universities. Although this does not cover all German doctoral students, it represents the majority. Of the countries where a significant number of German candidates are enrolled in universities, data are missing only for China and Russia. Most German doctoral students were enrolled at universities in Switzerland (2019: around 3,400), Austria (2018: around 2,200), the United Kingdom (2018: around 2,000) and the US (2019: around 1,200). German doctoral students in Switzerland alone account for 24% of all German doctoral students abroad. Switzerland's regional and linguistic proximity to Germany, the excellent conditions for research at renowned universities and attractive remuneration are likely to be the most important factors in Switzerland's popularity as a host country for German academics and researchers. The four countries at the top of the doctoral ranking together constitute roughly two thirds (64%) of all German doctoral students abroad. Other countries of some significance in terms of numbers of German doctoral students are the Netherlands (600), Sweden and Australia (500 each) and France (400). 75% of German doctoral students abroad work in these eight countries. The remaining 25% are spread across a further 26 countries.

> "Some 24% of all German doctoral students abroad are located in Switzerland.

Broken down by region, the overwhelming majority (76%) of doctoral students from Germany conduct research in Western Europe, with 11% in North America, 6% in Central and South Eastern Europe and 4% in Australia and Oceania. The regional distribution of German doctoral students abroad is thus very similar to the distribution of all German students abroad. Switzerland, the United Kingdom, Austria and the US are also among the most popular countries (see p. 64/65). It can therefore be assumed that a fair number of German students who gain a master's degree abroad remain at the same university, or at least in the same country, for their doctorate. One exception is the Netherlands, where a large number of German students enrol at their universities but not for

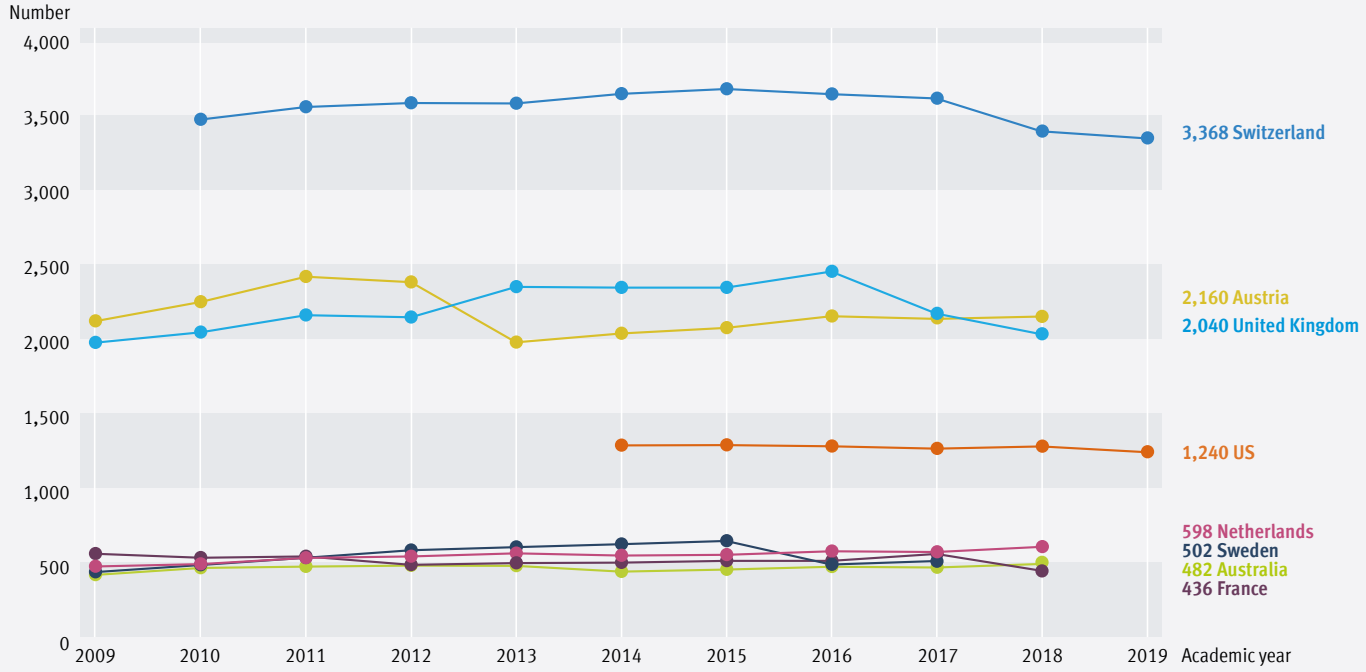
E1.5 German doctoral candidates at universities in selected host countries, in 2018 or 2019[1]

Host country	Reporting year	Number	Proportion of all doctoral candidates in %	Proportion of all German students in the country in %
Switzerland	2019	3,368	24.3	29.2
Austria	2018	2,160	15.6	7.4
United Kingdom	2018	2,040	14.7	13.3
US	2019	1,240	8.9	15.7
Netherlands	2017	563	4.1	2.5
Sweden	2017	502	3.6	28.2
Australia	2018	482	3.5	41.3
France	2018	436	3.1	10.3
Denmark	2017	390	2.8	12.9
Spain	2018	354	2.6	18.8
Canada	2017	270	1.9	24.3
Norway	2018	201	1.4	31.0
Slovakia	2017	196	1.4	30.9
Czech Republic	2019	194	1.4	22.1
Finland	2018	157	1.1	23.0
Italy	2017	134	1.0	9.1
Ireland	2018	121	0.9	22.1
New Zealand	2019	113	0.8	28.4

Host country	Reporting year	Number	Proportion of all doctoral candidates in %	Proportion of all German students in the country in %
Turkey	2018	90	0.6	2.3
Japan	2017	89	0.6	11.3
Romania	2019	79	0.6	4.9
Portugal	2018	79	0.6	4.5
Hungary	2019	71	0.5	2.1
Liechtenstein	2018	61	0.4	29.5
Israel	2018	49	0.3	20.6
Latvia	2019	37	0.3	3.7
Belgium (Flanders)	2018	33	0.2	7.9
Bulgaria	2019	32	0.2	2.2
Poland	2018	27	0.2	2.2
Iceland	2019	27	0.2	21.3
Brazil	2017	20	0.1	6.8
Estonia	2017	20	0.1	36.4
Greece	2017	19	0.1	1.4
Lithuania	2019	5	0.1	1.1
Total		**13,659**	**100.0**	**9.5**

Sources: Federal Statistical Office, "Deutsche Studierende im Ausland"; OECD; Department of Homeland Security (US) Student and Exchange Visitor Information System (SEVIS)

E1.6 German doctoral candidates abroad, by selected host countries, since 2009[1]



Sources: Federal Statistical Office, "Deutsche Studierende im Ausland"; Department of Homeland Security (US) Student and Exchange Visitor Information System (SEVIS)

a doctorate. One reason for this is probably that these are mainly students on bachelor's programmes; Germans make up only a comparatively small percentage of master's students there (see fig. C1.6 on p. 67).

In addition to the numbers of German doctoral candidates in other countries, considering German doctoral students as a proportion of all German students in a given country also sheds light on their geographical distribution. Viewed from this perspective, other countries come to the fore. Australia (41%) is in first place, followed by Estonia (36%), Slovakia and Norway (31% each) and Liechtenstein (30%). By contrast, although the number of German doctoral students in Austria is high, they account for only 7% of all German students and doctoral candidates in the country.

Footnote

1 The survey of German students abroad was based primarily on the current "Deutsche Studierende im Ausland" survey conducted by the Federal Statistical Office. This was supplemented by data from the OECD statistics and the Student and Exchange Visitor Information System of the US Department of Homeland Security to take into account current data from other host countries (including the US, Denmark, Czech Republic, Slovakia, Brazil and Israel). In some cases, the data for the various host countries refer to different years.

Compared to last year, the number of German doctoral students abroad has fallen only slightly, from around 13,900 to 13,700. However, the development in numbers of doctoral candidates across these countries reveals considerable variations. Poland (–44%), France (–21%), Ireland and Bulgaria (–18% each) all show steep declines. The number of German doctoral students also fell in the United Kingdom, New Zealand and Canada. By contrast, Israel (+158%), Hungary (+31%), Flemish Belgium (+22%) and Portugal (+13%) all show particularly substantial increases in doctoral students from Germany. When considering the long-term trends in numbers of German doctoral students in major host countries, it is apparent that declines have been taking place in Switzerland since 2015 and in Austria since 2016. The number of German doctoral candidates dropped in France within a year. Nevertheless, for all countries for which data have been available since 2009, it can be said that the number of German doctoral students has remained relatively high. Any fluctuations have remained within a fairly narrow range. This means that no significant changes can be observed in the essential regional distribution of German doctoral students abroad over the years.

1.3 Doctoral students on temporary doctoral-related visits abroad

Just as for students at bachelor's and master's levels, there are two types of international mobility for doctoral students: firstly, spending the whole duration of the doctorate abroad, including the period spent writing the thesis and the examination process; and secondly, doctoral-related temporary visits abroad while working on a doctorate in Germany.[1] The Federal Statistical Office regularly reports current data on the degree-related international mobility of German doctoral students (see p. 102/103) but representative surveys are currently still needed to provide information on temporary mobility. According to a study by the German Centre for Research on Higher Education and Science Studies (DZHW), 28% of all doctoral students working on their doctorate at a German university in 2019 have so far completed at least one doctoral-related temporary visit abroad. There are clear differences across the various subject groups. Above-average proportions of doctoral students with doctoral-related experience abroad are to be found in the humanities and in art and art history (38% each). This is due to the fact that many doctoral topics in the humanities, especially in the subjects of linguistics and literature, refer to other cultures. Doctorates in art history are also often distinctive for engaging with issues of this kind. In contrast, a relatively small share of doctoral students with experience abroad are found in the medicine and health sciences subject group (12%). A characteristic feature of the medical field is that the doctorate is often undertaken in parallel with specialist training, which limits opportunities for doctoral visits abroad.

> "Over half of temporary visits abroad were to Western Europe.

Methodology

Data on temporary international mobility of doctoral students at German universities were collected in 2019 within the framework of the DZHW's National Academics Panel Study (Nacaps). Around 20,000 doctoral students from 57 German universities that award doctorates took part in the nationwide survey. The data do not permit any comments on the overall scope of doctoral-related international mobility by the end of the doctoral phase but refer to all doctoral students at the time of the survey in 2019.

More than half of temporary visits abroad are spent in Western Europe (55%). Other major host regions are North America (17%), the Asia and Pacific region (11%) and Central and South Eastern Europe (9%). The other world regions of Latin America (3%), North Africa and Middle East (3%), Sub-Saharan Africa (2%) and Australia and Oceania (1%) play only a minor role. The key host country for doctoral students is the US; 13% of all doctoral-related temporary visits are spent there. Other major host countries are the United Kingdom (9%), France (8%), Italy and Austria (6% each) as well as Switzerland and China (5% each).

E1.7 Doctoral candidates at German universities with temporary doctoral-related visits abroad, by subject group, in 2019

Subject group	Doctoral candidates with temporary doctoral-related visits abroad in %
Humanities	38
Art and art history	38
Mathematics and natural sciences	31
Law, economics and social sciences	29
Engineering	29
Agricultural, forestry and food sciences, veterinary medicine	25
Medicine and health sciences	12
Total	**28**

Source: DZHW, National Academics Panel Study (Nacaps), 2019

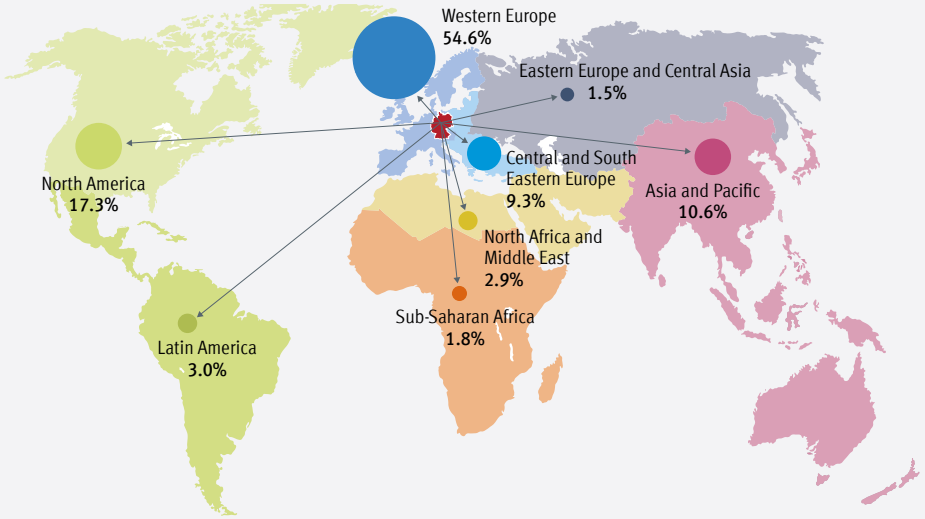
Structured doctoral programmes are particularly effective at promoting temporary visits abroad. Among doctoral students not on structured programmes, 26% have experience abroad related to their doctorate. That figure rises to 31% among those working on doctorates on structured programmes, reaching 33% for associate members of structured programmes. Alongside doctorates within structured programmes and being a part of certain disciplines, other factors that promote mobility while studying include an international working environment and concrete support for research visits.

Footnotes

1 See also: Netz/Hampel, (2019).

2 Deviations from 100% are due to rounding.

E1.8 Temporary doctoral-related visits abroad by doctoral candidates at German universities, by host region and key host countries, in 2019[2]



Host countries	Proportion in %
US	13.2
United Kingdom	8.5
France	7.5
Italy	6.1
Austria	5.7
Switzerland	5.2
China	5.1
Netherlands	4.2
Spain	4.1
Canada	2.5
Belgium	2.3
Japan	2.2
Denmark	2.2
Hungary	2.2
Sweden	2.0
Poland	1.9
Portugal	1.6
Australia	1.5
Greece	1.5
Israel	1.4

Source: DZHW, National Academics Panel Study (Nacaps) 2019

Staying on abroad following completion of a doctorate, whether for a short period or the long term, is an important option for doctoral candidates and their future career paths. Half of doctoral students plan to spend some time working abroad on completion of their doctorates. 23% of doctoral students intend to undertake at least a temporary teaching or research visit. A temporary period of unemployment abroad not related to research is on the agenda for 14%. A similar share are planning a long-term period of work in research outside Germany. 7% of doctoral students would like to work abroad in capacities not related to research. This means about a fifth of doctoral candidates intend to remain abroad in the long term on completion of their doctorates. 14% are also undertaking visits abroad for professional development purposes in the context of their future work. Finally, a further 15% are planning other or private visits abroad in the period following their doctorates.

> “Following completion of their doctorates, 50% of doctoral candidates intend to spend one or more periods of time abroad in the course of their careers.

E1.9 Planned visits abroad by doctoral candidates at German universities, in 2019, on completion of doctoral degrees

Planned visit	Agreement in %
No visit planned	49.9
Temporary visit for research or teaching candidates abroad	22.7
Visit for further education or training abroad	14.2
Temporary employment abroad not related to research	13.7
Permanent employment abroad related to research	12.5
Permanent employment abroad not related to research	7.1
Other or private visits abroad	14.7

Multiple responses possible

Source: DZHW, National Academics Panel Study (Nacaps) 2019

2.1 Mobility trends, funding organisations and funding groups

In 2019, a total of around 13,600 visits by German guest researchers abroad were funded by domestic and foreign organisations.[1] "German guest researchers" refers to persons who work in Germany as academics and researchers, receive financial support to teach and conduct research at a foreign university or research institute, and remain abroad for a limited period without occupying a specific post. Although the data do not include all the visits abroad by German guest researchers sponsored by German funding organisations, they capture the vast majority.[2] With regard to international funding organisations, however, the data can so far only represent a section of the funding activities, which is limited to a few countries and the Marie Skłodowska-Curie Actions of the EU.

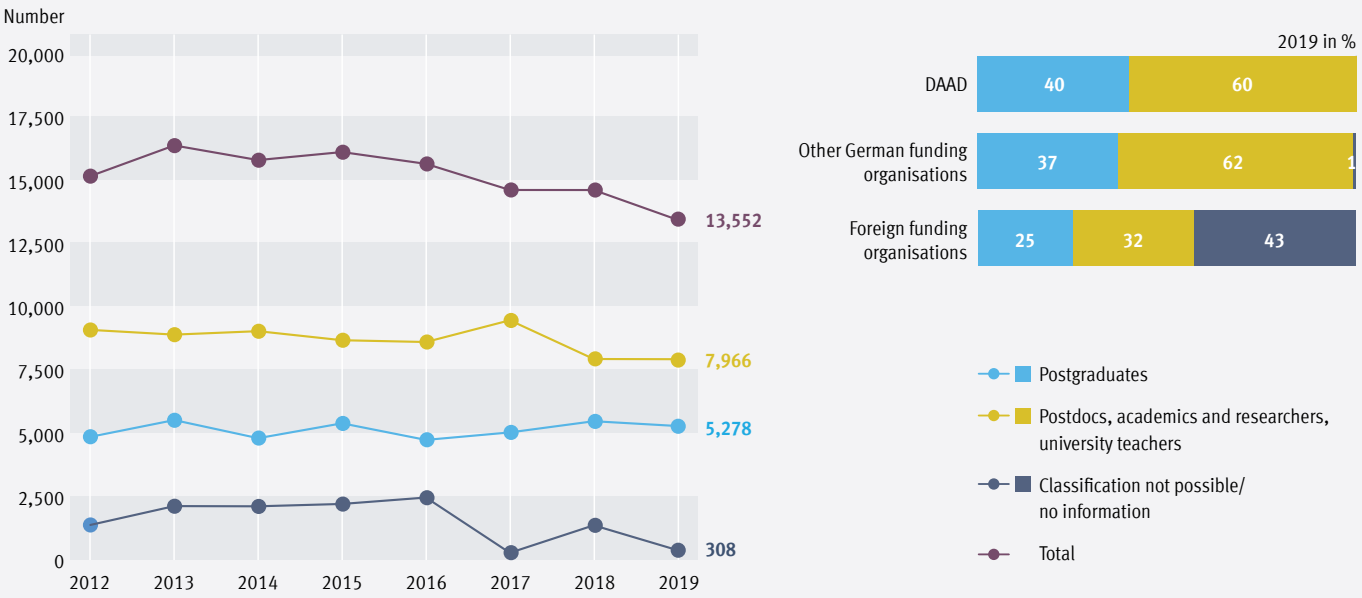
> "Funding for German guest researchers abroad is at its lowest level for eight years.

The number of funded visits abroad by German guest researchers is significantly lower than the corresponding number of foreign guest researchers in Germany (see p. 92/93). One reason for this is that data on German and, above all, foreign research institutions are incomplete. Another reason is that it is only possible to record visits abroad undertaken by German guest researchers that were funded by the Deutsche Forschungsgemeinschaft (DFG) as research scholarships. Furthermore, several German funding organisations only support visits by international academics und researchers.

Compared to last year, the number of scholarships awarded to German guest researchers abroad has dropped by 8%, putting it at the lowest level of this kind of research activity since 2012. There has been no change in the relative importance of the individual funding organisations. The DAAD continues to support the vast majority of visits by German guest researchers (77%), while the DFG funds 7% of visits. A further 12% of visits abroad are supported by smaller German funding organisations and 5% by the foreign organisations included here. Smaller organisations provide a wider range of funding to German academics and researchers than to foreign academics and researchers, although the overall levels still remain low. Nevertheless, their contribution should not be underestimated. Their activities make it clear that many institutions in Germany support international mobility for scientists and scholars. Furthermore, smaller funding institutions often focus their support activities on specific teaching and research areas or host countries or regions that would otherwise be paid less attention.

Funding was lower in 2019 for all types of funding organisations. The number of visits by German guest researchers funded by the DAAD and DFG dropped by 6% and 7% respectively, compared to last year. Declines were as high as 16% in other German and

E2.1 German guest researchers abroad by scholarship holder group, since 2012[1]



Sources: Responses from funding organisations; DZHW survey

foreign institutions. Nevertheless, some examples do not follow this trend. These include the Hans Böckler Foundation (+1,475%) and the Marie Skłodowska-Curie Actions (+26%), where levels of funding increased substantially.

59% of all funded German guest researchers are academics and researchers with doctorates, including professors and experienced researchers, such as research group leaders. A further 39% of the funded visits were undertaken by doctoral students and other postgraduates. This basic pattern of funding for different groups of academics and researchers has existed for a number of years, emphasising that the funding activities of these various organisations are structured around long-term strategies.

> “Three fifths of funding recipients hold doctorates.

The DAAD funds the majority (60%) of visits by experienced German academics and researchers with doctorates to foreign universities and research institutes. The pattern of funding for smaller German organisations is similar, with a high proportion of funding supporting visits by German post-docs (62%).

Footnotes

1 Excluding Erasmus visits abroad by German academics.

2 Missing data include information on the funding of German guest researchers’ visits provided by universities.

3 The DFG only records funded visits abroad by German guest researchers who have received funding through research scholarships.

4 Data for 2018.

5 Estimated.

6 Data for applicants for a residence grant in Switzerland only.

E2.2 German guest researchers abroad, by funding organisation, in 2019[1, 3]

Funding organisation	Number
Key German funding organisations	
German Academic Exchange Service (DAAD)	10,447
German Research Foundation[3] (DFG)	886
Other German funding organisations	
Max Weber Foundation – German humanities institutes abroad	255
Alexander von Humboldt Foundation	245
Hans Böckler Foundation	189
Studienstiftung des deutschen Volkes	153
Gerda Henkel Foundation[5]	145
Friedrich Ebert Foundation	104
CERN fellowships	95
Cusanuswerk (Episcopal scholarship foundation)	92
Heinrich Böll Foundation	63
Friedrich Naumann Foundation	52
Rosa Luxemburg Foundation	43
Boehringer Ingelheim Fonds	42
German National Academy of Sciences Leopoldina	41
Fritz Thyssen Foundation	32
Avicenna Studienwerk	10
Heinrich Hertz Foundation	6
Deutsche Herzstiftung	5
DECHEMA Foundation Research Institute	1
Foreign funding organisations	
Japan Society for the Promotion of Science	276
Swiss National Science Foundation[4, 6]	146
Marie Skłodowska-Curie Actions	191
Fulbright Commission	27
FWF Austrian Science Fund	6
Total	**13,552**

Sources: Responses from funding organisations; DZHW survey

2.2 Host regions, host countries and subject groups

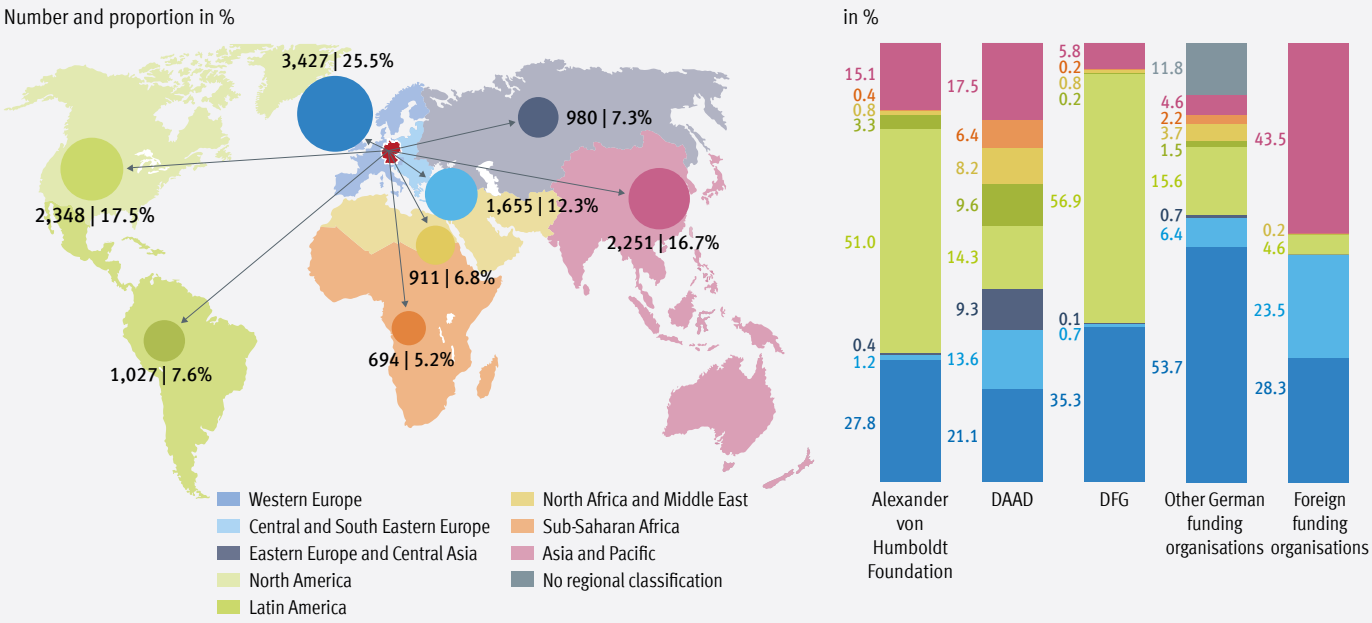
Western Europe is the key host region for German guest researchers whose visits abroad were supported by the domestic and foreign funding organisations included in this report. 26% of these funded visits are to Western European countries. Other major host regions are North America (18%) and Asia and Pacific (15%). These three host regions alone thus account for 58% of all visits by German guest researchers. By contrast, the percentages for Central and South Eastern Europe (12%), Latin America (8%), Eastern Europe and Central Asia, North Africa and Middle East (7% each) and Sub-Saharan Africa (5%) are significantly lower. There are clear differences to the regions of origin of foreign guest researchers in Germany (see p. 94/95). Only Asia and Pacific is of similar relative importance as a host region and a region of origin. Otherwise, German academics and researchers tend to prefer Western Europe and, above all, North America as host regions, while a higher proportion of foreign academics and researchers come to Germany from Central, Eastern and South Eastern European countries, Latin America, North Africa and Middle East. This focus on Western Europe and North America is probably a consequence of the high level of development of academia and research in these countries and many years of academic collaboration.

> “The US, United Kingdom and France are the key countries for funded visits by German guest researchers.

The various funding organisations are distinguished by their different regional emphases. In the cases of the German Research Foundation (DFG) and the Alexander von Humboldt Foundation (AvH), the percentages of sponsored guest visits to North America (57% and 51% respectively) are particularly high. The smaller German funding organisations primarily support visits to Western European countries (54%). In contrast, DAAD funding is more evenly spread across the various host regions.

The key host country for German guest researchers abroad is the US, followed by the United Kingdom and France. The US alone constitutes 15% of all funded guest visits, while the United Kingdom accounts for 6% and France 4%. While the figures for France have remained relatively constant in recent years, there have been decreases for the US and the United Kingdom of 17% and 10% respectively since last year. This puts the number of funded visits to the US by German academics and researchers at its lowest ever level. Other major host countries are Russia, Italy, Australia and China. Funding levels have fallen in every one of these countries except Russia. Japan shows a particularly sharp decline (–66%).

E2.3 German guest researchers abroad, by host region and funding organisation, in 2019[1, 2, 3]



Sources: Responses from funding organisations; DZHW survey

The two largest groups of German guest researchers abroad, accounting for 22% and 21% of the total respectively, are in the mathematics and natural sciences, and the humanities subject groups, followed by law, economics and social sciences, at 19%. Engineering (12%), medicine (5%), art and art history (4%) and agricultural, forestry and food sciences (2%) are less significant. In comparison to international guest researchers in Germany, where half are categorised as working in mathematics and natural sciences (see P. 94/95), German guest researchers are more evenly distributed across the various areas of teaching and research.

> “ 43% of funded German guest researchers work in the humanities or mathematics and natural sciences.

There are clear differences between the various funding organisations with regard to the specialist areas of the academics and researchers they fund. At the AvH, the natural sciences make up a particularly high percentage, at 62%. By contrast, the DAAD funded similarly high proportions of researchers across the humanities (22%), law, economics and social sciences (22%), and natural sciences (24%).

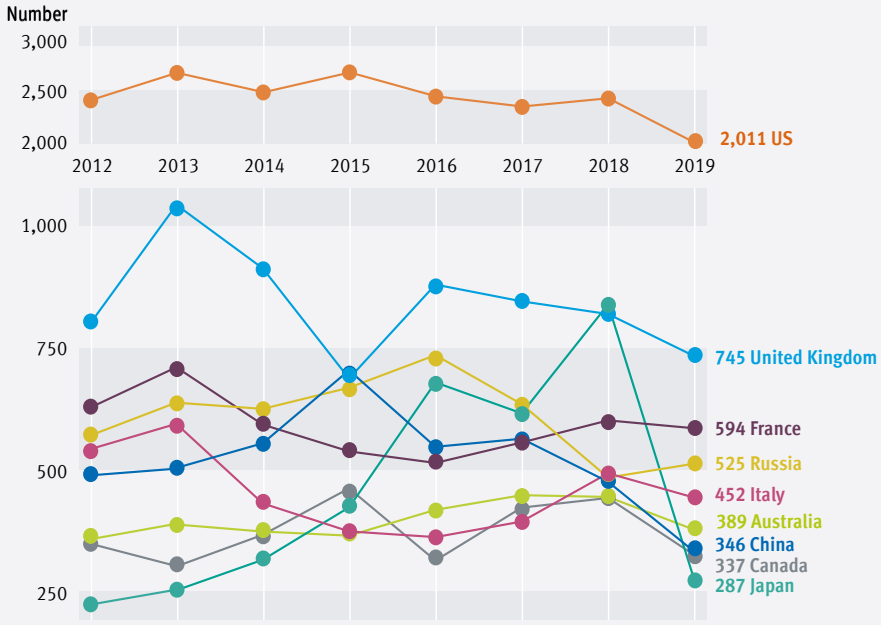
Footnotes

1 With the exception of EU funding under the Marie Skłodowska-Curie Actions, foreign funding organisations usually support visits to Germany by guest researchers from their respective countries of location.

2 Total German guest researchers abroad with support from funding organisations: 13,552 (including 425 guest researchers who cannot be assigned to a region of origin).

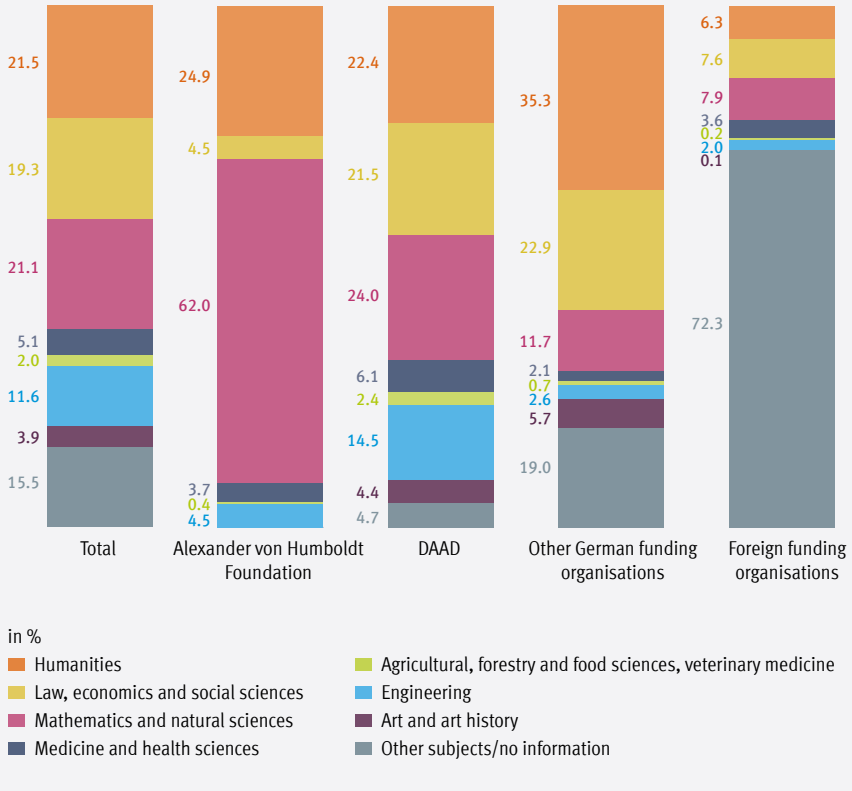
3 Deviations from 100% are due to rounding.

E2.4 German guest researchers abroad, by key host countries, since 2012



Sources: Responses from funding organisations; DZHW survey

E2.5 German guest researchers abroad, by funding organisations and subject group, in 2019



Sources: Responses from funding organisations; DZHW survey

2.3 Erasmus guest lecturers

The Erasmus+ programme of the European Union also supports temporary visits abroad for guest lecturers. These guest lectureships within Europe can last between two and sixty days. The funding covers teaching visits by academic staff and professors from universities and research institutes as well as by representatives from businesses. Participants in this programme do not necessarily have to be nationals of the country of assignment. Foreign staff at universities in the sending country can also participate in the programme. It is therefore possible that some Erasmus guest lecturers from Germany may not be German citizens, although this proportion is likely to be very small.

In the 2019[1] Erasmus year, around 3,000 Erasmus guest lecturers from Germany spent time teaching abroad with Erasmus funding. The number of guest lecturers has changed little since last year. The same applies to the past five years as well, where the number of guest lecturers from Germany has remained relatively constant at between 3,000 and 3,200.

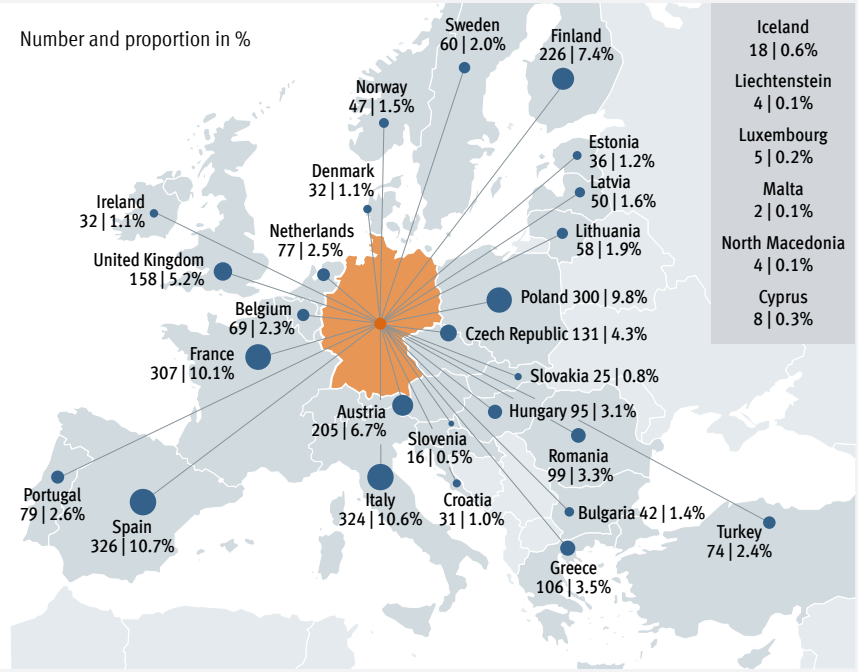
In 2019, most Erasmus guest lecturers went on visits to countries in Southern and Central Eastern Europe (24% each). 21% stayed in Western European countries and 13% in Northern European countries. 11% of visits were to South Eastern Europe and 7% to Central and Western Europe. Over the past five years, there have been no significant changes to the size or respective proportions of the groups in the various European countries.

> “Most Erasmus guest lecturers from Germany undertook visits in Southern and Central Eastern Europe.

Italy and Spain are the key host countries for Erasmus guest lecturers from Germany, accounting for 11% each. France and Poland were in third and fourth places with 10% each. Austria, Finland (7% each), the United Kingdom (5%), the Czech Republic and Greece (4% each) also play an important role. These countries have also been the preferred host countries for lecturers from Germany in recent years.

34% of German Erasmus guest lecturers abroad work in the arts and the humanities, making them the largest single subject group.[2] 18% are in the business, administration and law subject group, and a further 14% represent the engineering, manufacturing and construction subject group. 8% work in the social sciences, journalism and information subject group, and 6% each in the subject groups of education, the natural sciences, mathematics and statistics, and health and welfare. Information and communication technologies (4%), services (2%) and agriculture, forestry,

E2.6 Erasmus guest lecturers from Germany, by host region and host country, in 2019



Host region	Number	in %
Southern Europe	731	24.0
Central and Eastern Europe	742	24.4
Western Europe	643	21.1
Northern Europe	383	12.6
South Eastern Europe	333	10.9
Central and Western Europe	214	7.0
Total	**3,046**	**100.0**

Source: DAAD, Erasmus statistics

Footnotes

1 Erasmus statistics to 2014: the academic year begins in the winter semester and ends in the summer semester of the following year. 2014 = winter 2013/14 + summer 2014.
New Erasmus statistics from 2015: the academic year begins on 1 June of the preceding year and ends on 31 May of the following year. 2019 = 01/06/2018 to 31/05/2020.

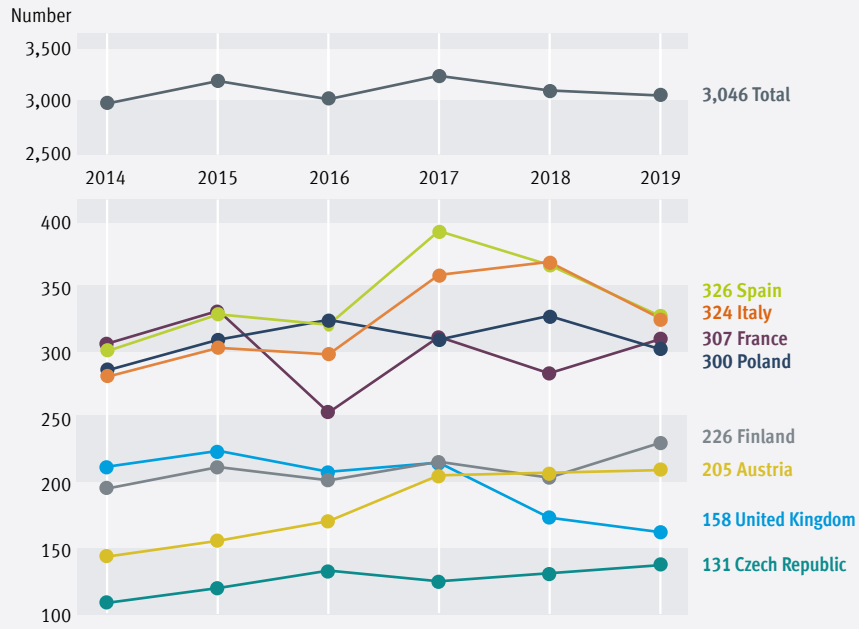
2 The distribution of Erasmus guest lecturers among the different subject groups is only available in the ISCED system.

fisheries and veterinary science (1%) are of minor importance. In comparison with the foreign Erasmus guest lecturers temporarily in Germany, there are no significant differences in the distribution of subject groups (see p. 98/99). This is due chiefly to the fact that Erasmus+ is designed as a reciprocal exchange programme, with a similar number of funded places at the partner institutions on both sides.

> “ At 34%, arts and humanities account for the vast majority of Erasmus guest lecturers from Germany.

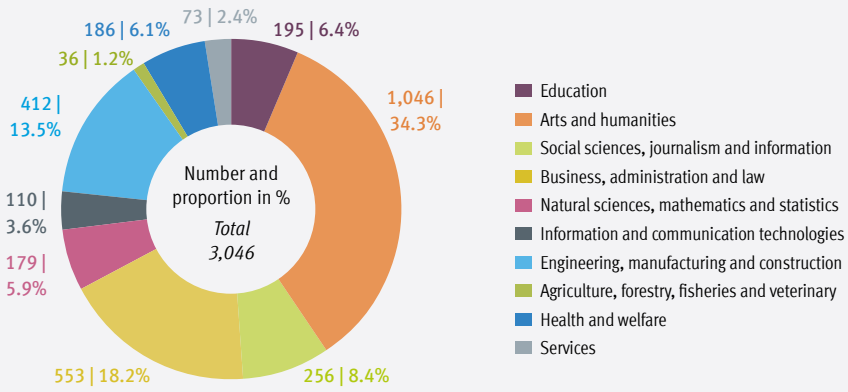
Although Erasmus guest lectureships may last up to two months, lecturers from Germany spend an average of only 5.3 days abroad. This figure is the same as last year. There are sometimes significant differences between individual host countries. Erasmus guest lecturers in the Czech Republic, Greece, Cyprus and Romania spent an average of between seven and eleven days there. By contrast, guest lecturers in the Netherlands, Malta and Slovenia stayed only four days on average.

E2.7 Erasmus guest lecturers from Germany, by key host countries, since 2014



Source: DAAD, Erasmus statistics

E2.8 Erasmus guest lecturers from Germany, by subject group, in 2019[2]



Source: DAAD, Erasmus statistics

E2.9 Erasmus guest lecturers from Germany, by host country and average visit duration, in 2019

Host country	Average duration in days: Days
Czech Republic	10.9
Cyprus	7.2
Greece	7.2
Romania	6.5
Luxembourg	6.2
Finland	5.8
Spain	5.8
Ireland	5.8
Turkey	5.6
United Kingdom	5.6
Iceland	5.6

Host country	Average duration in days: Days
Liechtenstein	5.5
Norway	5.5
Italy	5.3
Poland	5.3
Lithuania	5.3
France	5.2
Croatia	5.1
Portugal	5.0
Slovakia	5.0
Latvia	4.9
Sweden	4.9

Host country	Average duration in days: Days
North Macedonia	4.8
Austria	4.8
Estonia	4.7
Denmark	4.7
Bulgaria	4.6
Belgium	4.5
Hungary	4.5
Malta	4.0
Netherlands	4.0
Slovenia	3.6
Total	**5.3**

Source: DAAD, Erasmus statistics

SPOTLIGHT

Funding for the international mobility of academics and researchers in 2020

The Covid-19 pandemic presented organisations dedicated to promoting international mobility among academics and researchers with major challenges in 2020. Even if concrete data on changes in the numbers of visits to Germany by international academics and researchers, and by German academics and researchers abroad are not yet available, it can safely be assumed that there will have been substantial changes to levels of international mobility during this period. Regardless of their size, programme portfolio and the conditions of their funding, the new challenges these organisations faced at the beginning of the Covid-19 pandemic were all very similar. For instance, restrictions on mobility due to the pandemic caused considerable problems as it was difficult to plan with any confidence. For the organisations, it was a case of observing and evaluating the rapidly evolving conditions of the pandemic and constantly changing legal and regulatory environments, not only within Germany but in dozens of countries of origin and host countries around the world. They then had to draw conclusions about the implications for the mobility of the academics and researchers, and the support they needed. From the perspective of the funding organisations, the following challenges were particularly important in this regard:

> “Constantly changing restrictions to mobility and a lack of certainty around planning represented major challenges for funding organisations in 2020.

- appropriate responses to changing travel and visiting restrictions – from changing procedures around issuing visas to the organisation of quarantine accommodation and Covid-compliant visits, and facilitating childcare despite the closure of daycare facilities and schools;
- organising research when academic institutions and laboratories are closed or access is restricted;
- developing virtual forms of collaboration, including organising online selection conferences;
- dealing with changes to project schedules due mainly to the difficulty of keeping to project goals, but also to delays in the completion of doctoral degrees and risks to career plans;
- organising postponements or curtailments to visits;
- difficulties with planning and administering funding due to visits being postponed and additional requirements;
- substantial reductions in numbers of applicants for mobility funding.

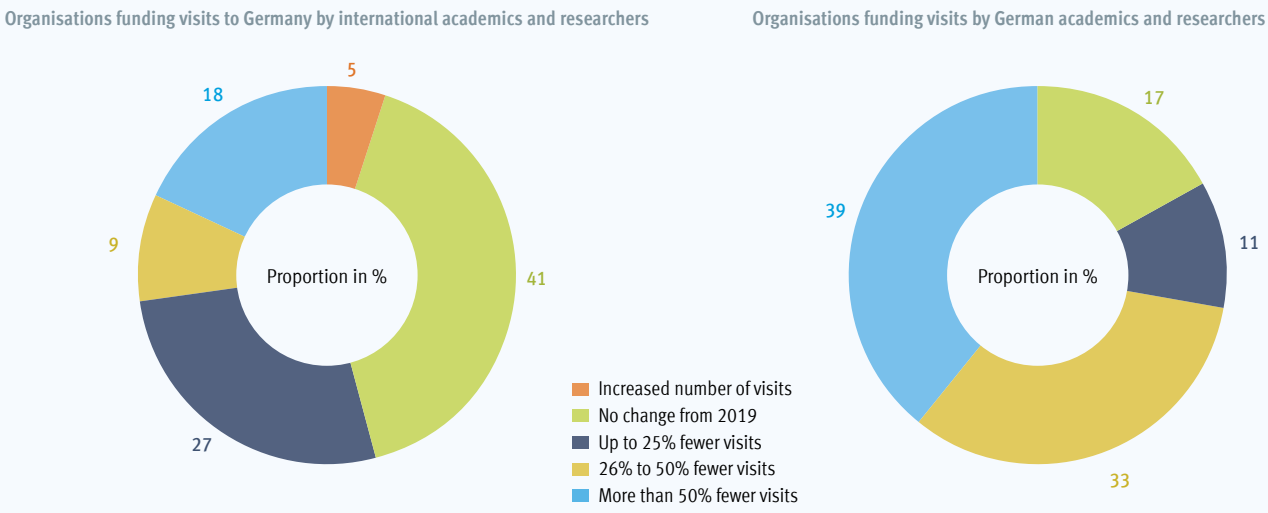
All relevant funding organisations faced similar challenges, yet their responses to the new conditions were very different. Some of the organisations had to reduce the number of visits by academics and researchers they supported, compared to 2019. With regard to supporting visits by academics and researchers in Germany, this problem affected 54% of all funding organisations surveyed. 18% of the institutions reduced the number of visits they funded by more than half. Nevertheless, the proportion of funding organisations surveyed that did not have to make any changes to their planned funding activities (compared to 2019) was surprisingly high, at 41%. These organisations were able to achieve the same or similar levels of funded visits. Indeed, 5% of the institutions were even able to increase the number of visits by international academics and researchers they supported.

Data basis

The DZHW gathers the data analysed in *Wissenschaft weltoffen* on funding for visits to Germany by international academics and researchers, and for visits by German academics and researchers abroad through annual surveys of the relevant funding organisations. The data are collected between nine and twelve months after the end of the reporting period. In the case of *Wissenschaft weltoffen*, for example, data on funding activities in 2019 were collected in early 2021. At this point, most funding organisations did not have precise funding data for the year that had just ended or the current year. The development of the international mobility of scientists under the pandemic conditions of 2020 is of particular interest to the editors and readers of *Wissenschaft weltoffen*. Therefore, the funding organisations in Germany[1] were asked for initial assessments of the development of their activities in 2020 as part of the regular data collection on funding in 2019. This was not a request for concrete data (not something most funding organisations were in a position to supply), but just for initial estimates. These estimates concern the extent to which mobility funding fell due to Covid-19, as well as curtailments and postponements of visits. The funding organisations were also asked about the particular challenges they faced in connection with the Covid-19 pandemic.

Of the 40 funding organisations to which questions were submitted, 29 (around 73%) were able to provide some level of information about changes to mobility funding during 2020. This response rate is sufficient to permit an initial indication of the trends that developed in 2020.[2]

ES1 Visits by internationally mobile academics and researchers cancelled due to Covid-19 in 2020 in comparison to 2019, by funding organisations



Sources: Responses from funding organisations; DZHW survey

In contrast, funding for visits by German academics and researchers abroad fell much more sharply. 83% of the organisations surveyed indicate reduced funding figures due to the pandemic, including 39% that report a drop in funded stays of over 50%. Only 17% were able to deliver largely unchanged numbers of visits.

Based on information supplied by funding organisations on changes in the numbers of visits, it is now possible to make an initial rough estimate of the quantitative effect of the Covid-19 pandemic on the international mobility of academics and researchers in 2020. Where organisations were not yet able to supply information, average values were taken as a basis. This estimate shows that the number of visits funded by German institutions for international academics and researchers in Germany in 2020 fell by 30% compared to 2019. Around 36,000 visits were funded in 2019 (including those for the Helmholtz Association and the Max Planck Society), while around 25,000 were probably achieved in 2020.

> “ The number of funded visits to Germany by international academics and researchers in 2020 was 30% lower than in 2019.

The decline in funding figures is even more pronounced for the stays of German researchers abroad funded by German organisations, falling by around 59% compared to 2019. As a consequence, whereas around 13,000 German academics and researchers were funded for research and teaching visits abroad in 2019, only around 5,000 completed such visits in 2020.

Alongside the reduction in funded visits, another consequence of the Covid-19 pandemic was that some visits were cut short or ended prematurely. Nevertheless, the majority of funding organisations were able to avoid these circumstances with regard

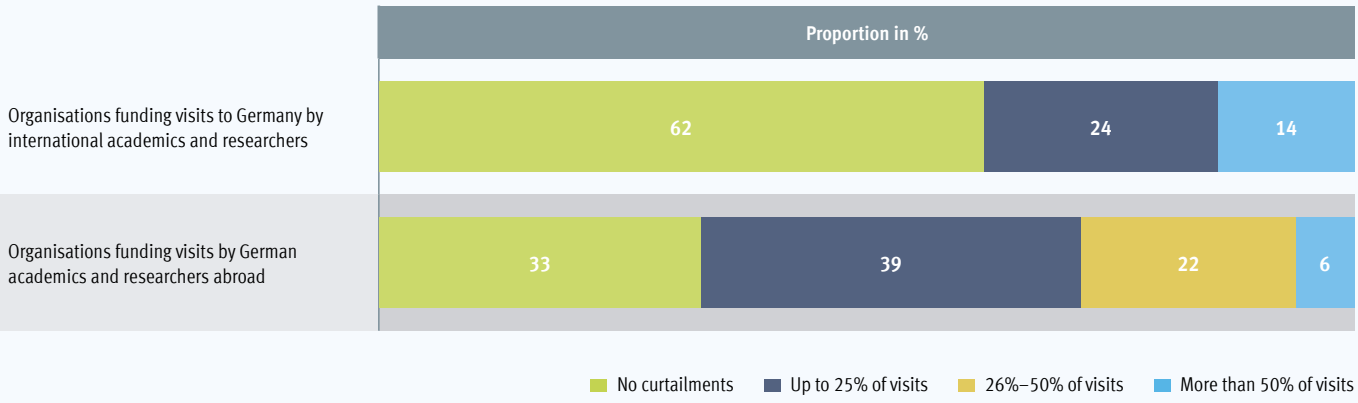
Footnotes

1 A survey of the foreign or international funding organisations was not conducted, due to the different data collection or later reporting dates.

2 Of the organisations that fund large numbers of academics and researchers, only the DFG and the Leibniz Association were unable to give any assessment of their funding activities in 2020 at the time of the survey.

Funding for the international mobility of academics and researchers in 2020

ES2 Funded visits by internationally mobile academics and researchers cut short due to Covid-19, by funding organisations, in 2020

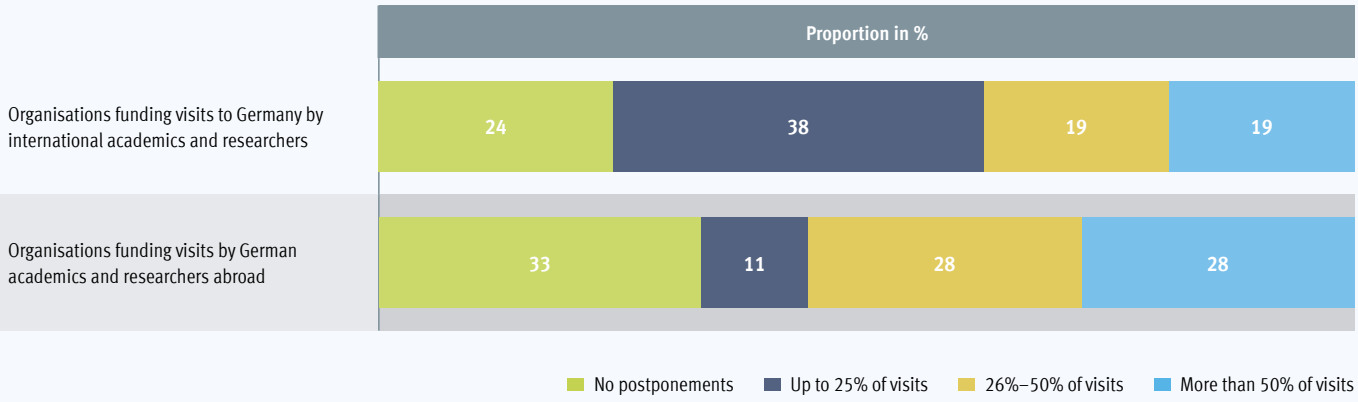


Sources: Responses from funding organisations; DZHW survey

to visits by international academics and researchers in Germany in 2020. Only 38% of the funding organisations concerned indicated that measures of this kind were required. Moreover, only 14% of the institutions surveyed reported that over half of funded visits by international academics and researchers had to be cut short.

However, the situation was markedly different concerning funding for German academics and researchers abroad. Here, 67% of the institutions concerned indicated that funded visits had to be cut short, with 28% of the institutions reporting curtailments to over a quarter of the visits they funded.

ES3 Funded visits by internationally mobile academics and researchers postponed due to Covid-19, by funding organisations, in 2020



Sources: Responses from funding organisations; DZHW survey

Another important option for funding organisations in their response to mobility restrictions due to the pandemic was to postpone funded visits, although the length of such postponements varied greatly. Only a minority of the organisations surveyed did not avail themselves of this option: about a quarter of the institutions that fund visits by international academics and researchers to Germany, and a third of the institutions that fund visits abroad by German academics and researchers. However, while only 38% of the former category of institutions postponed more than a quarter of visits by international academics and researchers, 56% of institutions that fund visits abroad by German academics and researchers undertook such measures.

> “ 56% of the organisations that fund visits by German academics and researchers abroad postponed more than a quarter of their funding in 2020.

Taking all these findings together, it is clear that the conditions caused by Covid-19 in 2020 were particularly unfavourable for the funding of visits abroad by German guest researchers. In the case of visits abroad by German academics and researchers, there were substantially more cancellations, curtailments and postponements than for visits to Germany by international academics and researchers. However, this does not come as much of a surprise. By definition, it is easier for funding organisations located in Germany to organise and supervise visits within their own country than in many foreign countries where the pandemic conditions and regulations may be very different and subject to constant change. Moreover, when considering the various funding organisations, no clear pattern emerges with regard to reductions, curtailments and postponements to visits in 2020. The key reason for this is probably the sometimes considerable differences between the conditions and objectives of the respective funding activities.

Mapping mobility: the data corpus and analytical approaches to the international mobility of students, academics and researchers

A number of data sources on the international mobility of students, academics and researchers are used for *Wissenschaft weltoffen*. When interpreting these data, it should be borne in mind that there are different types of student and researcher mobility, the data collection of which is tied to various preconditions. For example, it is much easier to track the inbound mobility of international students in Germany than the outgoing mobility of German students since valid official data on study-related visits abroad are not yet available in higher education statistics. By comparison, it is even more difficult to identify the international mobility of academics and researchers. In Germany and many other countries official records of this form of mobility are incomplete. In some cases, none are kept at all. By way of orientation for readers of *Wissenschaft weltoffen*, the following section therefore offers a brief overview of the relevant types of student and researcher mobility introducing the data sources available for this purpose.

A. Student mobility

Types of mobility

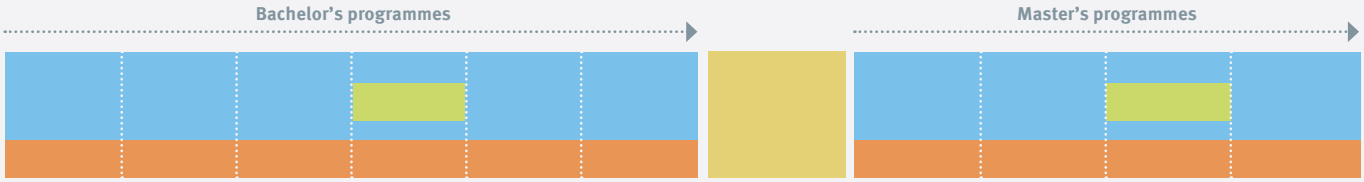
The terms *degree mobility* and *credit mobility* refer to students' international mobility. According to the "Mobility for Better Learning" European Mobility Strategy, degree mobility covers all study-related mobility during which a degree is acquired abroad. Credit mobility, on the other hand, refers to study-related visits abroad as part of a degree programme in Germany. In addition to temporary study visits abroad, this also includes visits abroad that are completed as placements, language courses, study trips, project work or summer schools.

In line with the difference between credit and degree mobility, *Wissenschaft weltoffen* distinguishes between temporary study-related visits abroad as part of a degree programme in Germany and visits abroad with the aim of obtaining a degree (degree-related international mobility). It should be noted that, due to the data situation regarding outgoing mobility, these two forms of mobility can only be separated to a limited extent. In the case of inbound mobility, on the other hand, a differentiation of this kind does not present any difficulties (see also the comments in the section below).

Available data sources and data quality

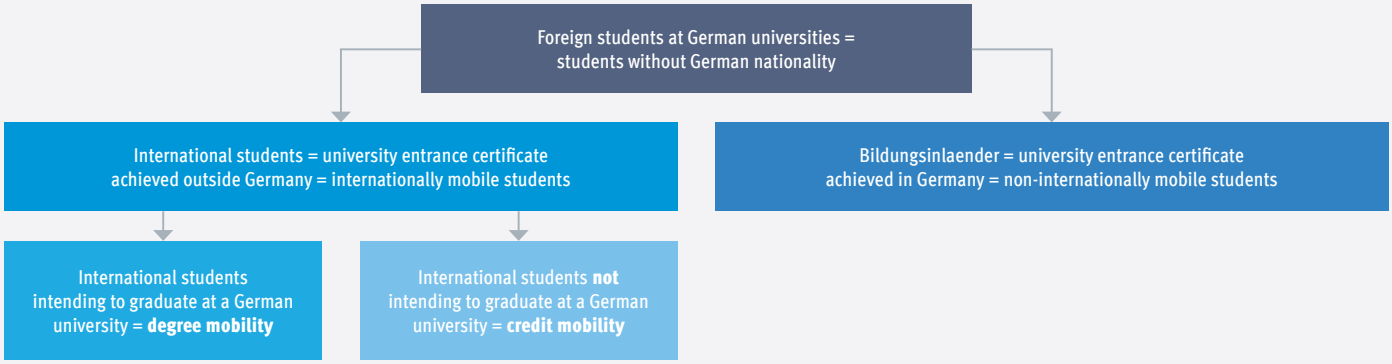
To record the **degree-related international mobility** (DRIM) of German students, it is necessary to refer to the available higher education statistics of the respective host countries, since these students have only enrolled at the universities there. The Federal Statistical Office Germany therefore conducts an annual survey of the institutions responsible for education statistics in around 40 major host countries of German students. The registered students are predominantly, but not exclusively, studying abroad with the intention of obtaining a degree. Erasmus students and other students on temporary study visits are also included in the data for some countries. The data on German first-year students and graduates abroad collected by the Federal Statistical Office from the 2008 academic year onwards are a useful further resource here. However, these data are available for fewer countries than the number of students. In addition to the official statistics, the statistics on international student mobility issued by UNESCO, OECD and the Statistical Office of the EU (Eurostat) can also be used to assess the DRIM. These are based on a joint data collection, the "UOE data collection on education systems". Despite the common data corpus, the three organisations have published different statistics on international student mobility since the basic data have been processed in different ways. Starting with the reporting year 2013, all three organisations agreed to apply the procedure previously used by UNESCO as a uniform procedure. Compared with the survey conducted by the Federal Statistical Office Germany, the UOE survey has the advantage of providing data for significantly more host countries and countries of origin. On the other hand, the documentation within the UOE data collection allows very few conclusions to be drawn about data quality, which varies greatly between host countries. Moreover, the published UNESCO and OECD data contain fewer differentiating characteristics (such as subject groups).

1 Types of study-related international student mobility in the course of two study cycles



Source: own presentation

2 Foreign students at German universities



Source: own presentation

Foreign students in Germany are covered by the regular student statistics of the Federal Statistical Office Germany. According to these statistics, all students without German citizenship are referred to as foreign students. This includes both *Bildungsauslaender* and *Bildungsinlaender*. Bildungsauslaender are international students who have acquired their university entrance certificate abroad or have supplemented their school qualifications acquired abroad by completing a preparatory course for higher education admission in Germany. As such, they count as internationally mobile students. In *Wissenschaft weltoffen*, they are referred to exclusively as *international students* in accordance with the term commonly used in other countries and in international organisations. Bildungsinlaender, on the other hand, are students with foreign citizenship who have obtained their university entrance certificate at a school in Germany or taken an aptitude or gifted students test here and are therefore not internationally mobile – at least at the beginning of their studies. In *Wissenschaft weltoffen*, international students are further divided into students who are aiming to obtain a degree from a German university and those who, as visiting students, are only staying in Germany temporarily for study-related purposes.

To date, no official statistics are available on the total **temporary study-related international mobility** (TSIM) of German students. Official data are only available for the partial area of temporary study or placement visits within the framework of the EU's Erasmus programme. According to the findings of corresponding surveys, these Erasmus stays represent about one third of the TSIM of German students. However, the introduction of the new Higher Education Statistics Act means that valid official data on study-related visits outside the Erasmus programme will also be available in the foreseeable future. Until then, the TSIM of German students will estimated by means of student and graduate surveys.

For **international students in Germany**, the figures on TSIM are included in the student statistics of the Federal Statistical Office Germany. The official statistics make it possible to identify international students who do not intend to graduate in Germany or intend to graduate abroad (referred to as visiting or guest students). In addition, Erasmus statistics are also available as a data source, although it should be noted that the (enrolled) students recorded here are also included in the student data of the Federal Statistical Office. It is also important to point out that the TSIM recording of international students in Germany only covers study visits at universities. Other study-related stays (e.g. placements, language courses, excursions) are not part of the official statistics prepared here. Finally, in accordance with the schemes of this exchange programme, Erasmus data include study visits and placements.

Data sources used

The central data corpus for the findings on the **degree-related international mobility of German students** presented here are the "Deutsche Studierende im Ausland" statistics published by the Federal Statistical Office Germany. For some minor host countries, these data are supplemented by figures from UNESCO statistics. To describe **temporary study-related international mobility**, *Wissenschaft weltoffen* uses not only Erasmus statistics but also results from the Social Surveys conducted by the German National Association for Student Affairs (DSW) and the German Centre for Higher Education Research and Science Studies (DZHW), especially when considering longer-term developments.

The main source for presenting trends in the numbers of **international students in Germany** are the student statistics collected by the Federal Statistical Office. Moreover, the report also analyses data on Erasmus participants from abroad who undertake temporary study visits or placements in Germany.

UNESCO student statistics are used to illustrate **student mobility worldwide**.

B. Researcher mobility

Types of mobility

There are three basic types of mobility among academics and researchers, based on the particular reason for mobility, which are closely interlinked and may overlap: project- and event-

related international mobility (e.g. conference trips, research projects abroad), qualification-related international mobility (e.g. doctoral studies abroad, postdoctoral projects abroad) and job-related international mobility (temporary or permanent research and teaching positions abroad). Many cases of academics' and researchers' mobility can be classed as several of these types, depending on the perspective. For example, many doctoral or postdoctoral projects abroad can involve both project-related and qualification-related international mobility. In addition to the overlaps between the three types of mobility of academics and researchers, they are also linked by causal relationships. This also applies to the specific forms of mobility within the three types of mobility. Study-related international mobility of students often leads to doctoral mobility, which in turn leads to postdoctoral mobility. Project-related mobility of academics and researchers often gives rise to event-related mobility and vice versa. Contacts tend to be established at international academic conferences, which in turn lead to project-related mobility among academics and researchers.

Available data sources and data quality

Research on international mobility among academics and researchers has so far relied mainly on **three data sources**: official or other publicly available statistics, publication databases (bibliometric data) and survey data. All three sources have strengths and weaknesses, some of which mirror each other, in other words, the strength of one source turns out to be a weakness of the others.

When **using** publicly **available statistics**, independent data are not collected but existing data sets used instead. The work involved in collecting data is thus eliminated, which may be regarded as the central strength of these sources. Moreover, official data usually offer the further benefit of very large samples or even full counts. In addition, publicly available data have the advantage that the findings can often be easily compared with other analyses that use the same data basis. The main limitation of publicly accessible statistics is that they are limited to the variables available in the

3 Major sources of information on student mobility

Data source/editor	Title of statistics or study	Data collection cycle	Types of mobility recorded[1]	Special characteristics
German students abroad				
Federal Statistical Office	Deutsche Studierende im Ausland	Annual	mainly DIM	Data from 40 major host countries for German students (at least 125 German students registered)
DAAD	Erasmus statistics	Annual	TSIM	Comprehensive data
DSW/DZHW	Social Survey	Every four years	TSIM	Representative nationwide sample
DZHW	Graduate panel	Every fourth annual cohort	TSIM	A total of three survey waves after graduation, representative nationwide sample
Institut für angewandte Statistik (ISTAT)	Graduate survey partnership project	Every annual cohort	TSIM	Changing and self-recruited participation of universities
International students in Germany				
Federal Statistical Office	Students at universities	Annual	DIM and TSIM	Comprehensive data
Federal Statistical Office	Graduations from universities	Annual	DIM	Comprehensive data
DAAD	Erasmus statistics	Annual	TSIM	Comprehensive data
DSW/DZHW	Social Survey	Every four years	DIM and TSIM	Representative nationwide sample
International student mobility				
UNESCO	UIS.Stat database (online)	Annual	mainly DIM	Comprehensive country data, differentiated by gender; no differentiation by type of degree
OECD	Education at a Glance, OECD.Stat database (online)	Annual	mainly DIM	Only OECD countries; differentiation by gender, type of degree and ISCED level[2]
Eurostat	Eurostat database (online)	Annual	mainly DIM	Only European countries; differentiation by gender, type of degree, ISCED level and ISCED subject group[2]

1 DIM = degree-related international mobility; TSIM = temporary study-related international mobility.
2 The collection and processing of the data is based on the *International Standard Classification of Education* (2011) and ISCE-F 2013 (fields of education and training), which ensures the international comparability of national data. ISCED 2011 differentiates between eight levels, with levels 5–8 encompassing tertiary education. ISCED-F 2013 distinguishes between ten subject groups.

Source: own presentation

4 Advantages and disadvantages of official statistics, bibliometric data and surveys on academic and researcher mobility

Official and other public statistics	Bibliometric data	Surveys
Advantages		
• Easy to collect: comprehensive or even complete surveys are possible • Developments over time can be analysed • No or low costs for access to databases or registers	• Easy to collect: comprehensive or even complete surveys are possible • Developments over time can be analysed	• Target populations can be defined precisely • Wide range of variables can be investigated • Samples are not contingent on coverage in public statistics • High degree of international comparability can be achieved
Disadvantages		
• Pre-defined samples • Sample dependent on coverage of academics and researchers in public statistics • Number of variables is pre-defined and severely limited • Severely restricted degree of international comparability	• Pre-defined, severely limited samples • Samples are contingent on publication activity of academics and researchers • Number of variables is pre-defined and severely limited • Severely restricted degree of international comparability • Costs of access to publication databases are high	• Access to respondents is difficult • Data collection is demanding for survey conductors and respondents • Number of respondents is often limited, making obtaining representative data problematic • Surveys are often only cross-sectional, making investigating developments over time impossible

Source: own presentation

respective databases and cannot be supplemented by additional variables that allow for in-depth analysis (e.g. of the causes and effects of academics' and researchers' mobility). Moreover, they usually only cover academics and researchers at public institutions. A further weakness of this source, which still exists at present, is the lack of comparability of the data across national borders since different definitions of academics and researchers are often used, while the quality and completeness of official data collections also vary greatly from country to country.

For **bibliometric analyses** on academics' and researchers' mobility, international publication and citation databases are used as a data basis. Usually, one of the two predominant databases around the world, *Scopus* (Elsevier) or *Web of Science* (Clarivate), is used. These databases contain a certain share of the articles published worldwide in (English-language) academic journals and their citations in other articles. In addition, the respective country of location of the author's institution is documented for each article. In this way, such databases can also be used for the analysis of international academics' and researchers' mobility since the comparison of the country of location of different contributions submitted by an author allows conclusions to be drawn about their mobility biography. The strengths of this source largely correspond to those of publicly available statistics, that is, no data collection effort, large samples or full counts and comparability with other analyses that use the same publication database as their basis.

Despite the comprehensive data sets on which bibliometric analyses can be based, they are subject to some significant limitations. First, access to existing international publication databases entails high costs. Moreover, only those researchers who have (already) published in academic journals are included, which in turn are covered by the publication databases used. These are primarily English-language journals on the natural sciences and economics. This means that academics and researchers from disciplines where monographs and anthologies still play an important role as publication media (i.e. primarily the humanities and social sciences) are strongly under-represented. Since there are also strong differences between countries with regard to these publication cultures, and non-English language publications are also systematically under-represented in most international publication databases, country comparisons based on bibliometric analyses can only be of limited value. Moreover, a complete assessment of mobility biographies in bibliometric studies is not possible since mobility is only recorded if a publication (in publication databases) has been published before and after the mobility to the respective country of residence. Furthermore, academics and researchers are only included in the sample from the time of their first publication. Mobility before this first publication is therefore excluded, which can lead to a false assessment of the mobility status and respective country of origin. Thus, all academics and researchers who have published in different countries within the period under review are usually considered mobile, whereby the first country of residence within the period under review is considered the country of origin. It cannot be ruled out that previous mobility is excluded and that the alleged country of origin is already a host country. After all, at least two publications during the period under review are required

5 Major data sources on academic and researcher mobility

Data source/editor	Title of statistics or study	Publication cycle	Special characteristics
Foreign academics and researchers in Germany			
Federal Statistical Office	University staff	Annual	Comprehensive data
Federal Statistical Office	Financial statistics from public research institutes (staff at non-university research institutes)	Annual	Comprehensive data
Federal Statistical Office	Students at universities (doctoral students)	Annual	Includes doctoral candidates only
DAAD	Erasmus statistics (guest lecturers)	Annual	Comprehensive data
DAAD/DZHW	Guest researchers with funding	Annual	Surveys of relevant funding organisations
German academics and researchers abroad			
DAAD/DZHW	Guest researchers with funding	Annual	Surveys of relevant funding organisations
DAAD	Erasmus statistics (guest lecturers)	Annual	Comprehensive data
National statistics offices in other major host countries	University staff statistics	Annual	Varying definitions of academics, researchers and universities recorded; scope of data collection varies
International academic and researcher mobility and partnerships			
EU office of the Federal Ministry of Education and Research (BMBF)	EU Framework Programmes contract database	Annual	Comprehensive data
OECD	Student statistics (international doctoral students)	Annual	Does not contain information on international doctoral candidates in the US
National statistics offices in other major host countries	University staff statistics	Annual	Varying definitions of academics, researchers and universities recorded; scope of data collection varies
Elsevier, Clarivate	Scopus, Web of Science	Continuous	Contains bibliometric data on publications around the world
European Commission	Mobility Patterns and Career Paths of EU Researchers (MORE)	Every three years since 2010	Only regular international survey of academics and researchers in the world

Source: own presentation

to determine mobility. Accordingly, young researchers who have published no or only one academic journal article during the period under review are excluded from the analysis.

In contrast to the two methods described so far, surveys are characterised in particular by the collection of new data on researcher mobility. This has the advantage that the researchers themselves can determine who is to be interviewed and which questions are to be asked or which characteristics surveyed. The number of variables available for the analysis of the mobility of academics and researchers is therefore generally much higher than in public statistics and publication databases, thus allowing more in-depth or explanatory analyses (e.g. on the mobility motives or obstacles of academics and researchers). Furthermore, researchers who are not covered by publication databases or public statistics (e.g. researchers in companies) can also be included in the analysis. Finally, in the case of internationally designed surveys of academics and researchers, a high degree of international comparability of the data from the different countries can be guaranteed. However, surveys involve a considerable amount of time and effort, and therefore also high costs. These limitations mean that regular surveys are relatively infrequent and therefore not suitable as a basis for ongoing statistics on academics' and researchers' mobility. The only exception in this respect is the EU-funded study "Mobility Patterns and Career Paths of EU Researchers" (MORE), which has been conducted every three years since 2010, with the last one completed in 2020 and published in 2021 (MORE4).

Data sources used

In *Wissenschaft weltoffen,* different data sources are used to draw as comprehensive a picture as possible of the **mobility of academics and researchers in Germany** and other countries. The official statistics of the Federal Statistical Office Germany relating to foreign academic staff at state-recognised universities and non-university research institutes and to registered international doctoral students are used to record foreign academics and researchers in Germany. In addition, data on short-term visits are also analysed from Erasmus statistics (Erasmus guest lecturers) and from a query by the DZHW on funded foreign guest researchers in Germany at relevant funding organisations. With regard to the official statistics relating to academic staff, it should be noted that the international academics and researchers recorded are not necessarily actually mobile in all cases since only information on citizenship is collected here, but not on the country of highest educational attainment. A differentiation between international students and Bildungsinlaender, as in the case of foreign students in Germany, is therefore not possible at this point.

The data basis for recording **German academics and researchers abroad** has so far been very patchy, particularly with regard to longer-term stays (qualification- or job-related international mobility). Short-term visits abroad are covered by Erasmus statistics on Erasmus guest lecturers and by the above mentioned DZHW query to relevant funding organisations. These data are supplemented by a further query conducted by the DAAD and DZHW at the respective statistical offices on German university staff in major host countries of German academics and researchers. The job-related international mobility recorded here is subject to country-specific definitions and restrictions.

Finally, to depict **international researcher mobility**, *Wissenschaft weltoffen* uses OECD data on international doctoral students worldwide, official national data on international researchers at universities and public research institutes in major host countries, funding data from the contract database on the EU's research framework programmes, and bibliometric data from Elsevier's Scopus database (prepared and analysed by the DZHW).

GLOSSARY

Academic and artistic university staff
According to higher education statistics, academic and artistic staff at universities consist of professors (including guest, honorary and non-scheduled professorships), lecturers and assistants, academic and artistic staff, specialised teaching staff, emeriti, lecturers, assistant lecturers, student research assistants (with degree) and tutors.

Academics and researchers
In the context of *Wissenschaft weltoffen*, academics and researchers are defined as persons who are professionally involved in the conception and publication of new findings and who develop or improve concepts, theories, models, instruments, computer programmes or methods within the framework of their research.

Academic year
Used here as a reference value for determining the number of students or first-year students. For students, the number of students in a winter semester is taken as the number for the academic year. In *Wissenschaft weltoffen*, students in the winter semester 2019/20 are defined as students in the 2020 academic year. For first-year students, it is specified that the total number of first-year students of a summer semester and the following winter semester is the number for the academic year. The first-year students of the academic year 2019 are the first-year students of the summer semester 2019 and the winter semester 2019/20.

Bildungsauslaender
Students with foreign citizenship (or stateless persons) who have obtained their university entrance certificate at a school abroad. Since the 2020 edition of *Wissenschaft weltoffen*, → *international students*, a term widely used around the world, has been employed instead.

Bildungsinlaender
Students with foreign citizenship (or stateless persons) who have obtained their university entrance certificate at a German school.

Bridge mobility
Study-related visits abroad between completing a domestic bachelor's programme and commencing a master's programme.

Credit mobility
→ Temporary study-related visits abroad

Degree mobility
→ Degree-related international mobility

Degree-related international mobility
Study at a foreign university with the intention of obtaining a degree there.

First-year students
International first-year students in Germany are students at a German university in the first semester of higher education. In most countries, international first-year students are students who appear in the student statistics for the first time, regardless of the semester in which they are actually enrolled. Some of these students are therefore also students in later semesters.

Foreign students
All students with foreign citizenship, including stateless students and students with dual citizenship: in other words, both international students and foreign students who have obtained their university entrance certificate at a German school (referred to as → *Bildungsinlaender*).

Funded groups
Here, the funded groups include:
- Postgraduates | persons with a university degree who are funded to work on a dissertation as foreigners in Germany or as Germans abroad, as well as persons who receive a mobility grant after completing their studies, even if they do not intend to study for a doctorate.
- Postdocs | persons who have completed a doctorate and whose stay in Germany or abroad is funded in order to gain further qualifications through research. This also includes university lecturers and experienced academic staff from universities and research institutes.

Graduation year
A graduation year comprises the graduates of a winter semester and the following summer semester. The number of graduates in 2019 is the sum of the number of graduates of the winter semester 2018/19 and the summer semester 2019.

International students/internationally mobile students
Students who are internationally mobile in order to study, in other words, they cross national borders to move from their country of origin to their host country. Since the 2020 edition of *Wissenschaft weltoffen, international students*, a term widely used around the world, has been employed instead of *Bildungsauslaender*.

Students in later semesters
Different definitions exist, depending on the survey study. In the DSW Social Survey, all university students in the 9th to 14th semester of higher education and all university of applied sciences students in the 7th to 11th semester are considered to be students in later semesters.

Temporary study-related visits abroad
Study-related visits abroad as part of a domestic study programme, during which credit points are earned with the aim of having them recognised by the home university (e.g. semester abroad, placement abroad, summer school, language course).

Transnational Education Projects (TNE)
Transnational education projects are study programmes for which a university from abroad bears the main academic responsibility. Here, this refers only to TNE study programmes, TNE faculties, branch campuses – in other words, spin-offs or branches of universities abroad – and binational universities, that is, no double degree programmes or distance learning programmes.

Types of study
The types of study include:
- First degree programmes | programmes leading to a first university degree.
- Postgraduate degree programmes | studies after completing a first degree programme; postgraduate degree programmes include second degree programmes, postgraduate studies, supplementary, extended and additional studies, continuing education programmes, non-consecutive and consecutive master's programmes.
- Doctoral studies | studies or academic work aimed at obtaining a doctorate.

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STRUCTURE OF THE WORLD REGIONS

Since the 2017 edition, the regional classification of *Wissenschaft weltoffen* corresponds to the DAAD regional classification:

Western Europe
Andorra, Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, United Kingdom, Vatican City

Central and South Eastern Europe
Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovakia, Slovenia, Turkey

Eastern Europe and Central Asia
Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldavia, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

North America
Canada, US

Latin America
Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela

North Africa and Middle East
Afghanistan, Algeria, Bahrain, Egypt, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Pakistan, Palestinian territories, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates, Yemen

Sub-Saharan Africa
Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Congo/Democratic Republic, Djibouti, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Southern Sudan, Sudan, Tanzania, Togo, Uganda, Zimbabwe, Zambia

Asia and Pacific
Australia, Bangladesh, Bhutan, Brunei, Cambodia, China, Cook Islands, East Timor, Fiji, Hong Kong (CN), India, Indonesia, Japan, Kiribati, Laos, Macau (CN), Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, New Zealand, Niue, North Korea, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Thailand, Tonga, Tuvalu, Vanuatu, Vietnam

Wissenschaft weltoffen 2021

Internationalisation is one of the prerequisites for the successful development of teaching and research at universities. For this reason, the internationality of the German higher education system is subject to regular empirical review to provide politics and society with comprehensive information. In this context, *Wissenschaft weltoffen* has been established as the **central source of information on the mobility of students and researchers**.

For the last issue, DAAD and DZHW **fundamentally revised the publication format**. For example, the previous focus chapter was replaced by an expansion of the previously introduced spotlights. These spotlights present particularly relevant aspects in greater detail, but as briefly and clearly as possible. In the present issue, three spotlights therefore explore the impact of the Covid-19 pandemic on the international mobility of students and researchers. Instead of a bilingual main edition, there are now separate German and English language main editions, separate main editions are now available in German and English, as was previously the case with the compact edition. This creates more space for data explanations and interpretations, making it easier for German and international readers to access the information offered by *Wissenschaft weltoffen*.

Once again, the present 21st issue has a number of new features. For example, for the first time, Chapter A offers its **own bibliometric data on the international mobility of scientists**, collected by the bibliometrics experts at the DZHW. This innovation will enable us to update these data annually in the future and tailor it more closely to the needs of our readers than was possible with the OECD data used so far. To help readers understand how bibliometric data are collected and what should be considered when interpreting them, we have added a spotlight on the methodology of bibliometric mobility measurements to this year's chapter.

Other **spotlight topics in this issue**:

- Changes in numbers of international students in Germany in 2020
- German students' international mobility under Covid-19
- Funding for the international mobility of academics and researchers in 2020

Another important improvement is the **new *Wissenschaft weltoffen* website**, which can be accessed at www.wissenschaft-weltoffen.de. The new site now offers users the option of downloading every single illustration from the various editions (main and compact editions, German and English) as a graphic file or a data table. For the first time, the website and the PDF version of *Wissenschaft weltoffen* are barrier-free, so that readers with impairments also have easier access to the website's various information.

DAAD

The **German Academic Exchange Service (DAAD)** is the world's largest funding organisation for the international exchange of students and scholars. Since it was founded in 1925, around 2.6 million scholars in Germany and abroad have received DAAD funding. It is a registered association and its members are German universities and student bodies – in 2020, 242 universities and 105 student councils were registered members.

The DAAD is mainly funded by the Federal Foreign Office, the Federal Ministry of Education and Research, the Federal Ministry for Economic Cooperation and Development and the European Union. Other sponsors are foreign governments, companies, foundations and the "Stifterverband für die Deutsche Wissenschaft". The DAAD's head office is located in Bonn, and the DAAD also maintains an office in Berlin, to which the renowned Artists-in-Berlin Program is affiliated. A network of 68 foreign offices and around 470 lectors worldwide maintains contact with the most important partner countries on all continents and provides advisory services on the ground.

www.daad.de

DZHW

The **German Centre for Higher Education Research and Science Studies (DZHW)** is a research institute funded by the federal and state governments, and based in Hannover and Berlin. As an international competence centre for higher education research and science studies, the DZHW carries out data surveys and analyses, provides research-based services for higher education and science policy and supports the scientific community with a research infrastructure in the field of higher education research and science studies.

Research at the DZHW is theory-based and practice-oriented. One particular strength of the DZHW's research lies in the long-term observation of trends in the higher education and science sector, to some extent from an internationally comparative perspective. Its profile is defined by its studies, unique in Germany, of those qualified to study at university, students and university graduates. Research at the DZHW focuses on the subject areas of educational careers and graduate employment, research system and science dynamics, governance in higher education and science, and methods of empirical social sciences.

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