

India, Germany and Europe: a Spatial Perspective at SDG 4 on Quality Education

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Veröffentlichungsversion / Published Version

Arbeitspapier / working paper

Empfohlene Zitierung / Suggested Citation:

Binot, R., Debnath, T., Kar, B., Kundu, D., Milbert, A., Mishra, R., ... Schmidt-Seiwert, V. (2020). *India, Germany and Europe: a Spatial Perspective at SDG 4 on Quality Education*. (BBSR-Analysen KOMPAKT, 13/2020). Bonn: Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen und Raumordnung (BBR). <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-71338-3>

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Federal Institute for
Research on Building,
Urban Affairs and
Spatial Development

within the Federal Office for
Building and Regional Planning



India, Germany and Europe

A Spatial Perspective at SDG 4 on Quality Education

Responding to crucial challenges in urban and rural development the United Nations decided on the New Urban Agenda and on the 2030 Agenda and the Sustainable Development Goals (SDGs). This publication checks the progress made in implementing the New Urban Agenda against the SDGs and vice versa. In order to understand the spatial patterns, a national and supranational spatial perspective is taken on some of the SDGs. Given the significance of quality education, SDG 4 thus covers:

- All gender early school leavers with low and high educational qualification and students
- Female early school leavers with low and high educational qualification and female students
- Scholar exclusion

Authors

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Joint foreword

Dear Reader,

the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) and the National Institute of Urban Affairs (NIUA) signed in 2018 a Joint Declaration of Intent to cooperate on different aspects of evidence-based research and expert positioning as well as policy advice. Several expert workshops and a series of joint presentations at the United Nations World Urban Forums 2018 and 2020 have led to a better understanding of our common challenges and to better knowledge of possible solutions.

A first joint publication of BBSR and NIUA (BBSR-Analysen KOMPAKT 06/2019) was dedicated to spatial structures and trends in India, Germany and Europe. The analysis focused on population development and migration, urbanization and suburbanization as well as land-use for new settlements. The positive resonance by readers encouraged us to continue our joint analytical work.

The United Nations remind us with their revised World Urbanization Prospects of 2018 of the urbanization changes affecting all countries worldwide. In that respect, our joint work and expert exchange are a part of the bilateral urbanization partnership between the responsible ministries in India and Germany.

In the framework of our cooperation, we develop and deepen a comparable picture of the spatial structures and trends in our countries and continents. In doing so, we try to find and further strengthen a common data-oriented language that is based on national and supranational data sources and may contribute to making global data sets compatible.

Our joint efforts are guided by the thematic priorities defined in the New Urban Agenda of the United Nations and its references to the Sustainable Development Goals (SDGs) – this publication focuses on SDG 4 on Quality Education.

We wish you a stimulating reading.



Dr. Markus Eltges
Director of the Federal Institute for Research on Building,
Urban Affairs and Spatial Development



Hitesh Vaidya
Director of the National Institute of Urban Affairs



Introduction

BBSR and NIUA continue with this publication on the Sustainable Development Goal 4 in India, Germany and Europe as well as the accompanying publications on SDG 3 and SDG 11 their efforts in identifying and applying a comparable approach to reporting on urban and rural development. In doing so, a look at SDG 4 is of particular interest for umbrella organisations of cities and communities with regard to primary education services close to the places where people live (Elsaeßer et al. 2020). The publication describes the findings in texts and maps in the same way as it discusses similarities and dissimilarities from national and supranational perspectives – all within the limits of available and comparable data sources.

The United Nations set a new policy framework for urban and rural development with the 2030 Agenda and the Sustainable Development Goals (SDGs) in 2015 and the New Urban Agenda in 2016. Their revised World Urbanization Prospects (UN DESA 2018) provide updated estimates and projections of the urban and rural population for all countries of the world as well as their major urban agglomerations.

Reporting on the implementation of the New Urban Agenda will start in 2022.

UN-Habitat, the housing and settlement programme of the United Nations, is expected to provide evidence-based and data-oriented reports – so called Quadrennial Reports – every four years from that year on. Member States of the United Nations are invited to report on the national and sub-national implementation by 2021. This publication contributes to these reporting mechanisms.

As cross-references between the New Urban Agenda and the 2030 Agenda are evident, the SDGs and their underlying indicators constitute the analytical pattern of the publication. Considering the availability of data sources at national and supranational level, it covers with regard to SDG 4 (Quality Education) the following selected sub-goals (the figures in brackets refer to the numbering of the Global Indicator Framework adopted by the General Assembly of the United Nations):

- Early school leavers (SDG 4.1)
- School leavers with higher education entrance qualification (SDG 4.3)
- Students (SDG 4.3)
- Early female school leavers (SDG 4.5.1)
- Female school leavers with higher education entrance qualification (SDG 4.5.1)
- Female students (SDG 4.5.1)
- Scholar exclusion (SDG 4.a)

SDG 4 highlights the human right on education and requests institutions to ensure inclusive and equal access to education for all. Almost every country disposes of compulsory schooling, even if in low-income countries not all families may afford sending their children to school. In Germany, attending school is mandatory for all pupils from elementary to lower secondary level, i. e. from the age of 6 to 15 years. The higher secondary level ends with receiving the permission to attend a university, usually at the age of 19 years. India enacted in 2009 the Right of Children for Free and Compulsory Education Act guaranteeing free and compulsory education from the elementary to the lower secondary level, i. e. from the age of 6 to 14 years. Various groups and institutions in India, amongst them the governmental bodies and NGOs, have been striving to improve education. The age of 11 years is the corresponding age for entering lower secondary or upper primary education while the age of 19 years considers the prevalence of over-age education in India.

In many countries, one can note gender differences related to schooling at all levels or at graduation. Education in general and the education of girls and young women in particular influences to a great extent the social and economic development of countries, ranging from health and birth

control to a higher economic output of enterprises led by mixed teams. In many high-income countries, education success is higher for female students. However, intersectional inequalities remain.

SDG 4 aims at inclusive and equal education without restrictions. In many countries though education and the integration of pupils with intellectual, sensory, motor, language, social or cognitive disabilities does not show a satisfactory picture. SDG 4 addresses this topic not directly. However, it is a mission in Europe and in Germany (Autorengruppe Bildungsberichterstattung 2020) to integrate disabled pupils better in regular schooling. In Germany, many forms of specialised schools exist in parallel apart from integrative schools. Furthermore, education is a responsibility of the respective Länder. India takes at the national level the approach of inclusive education towards educating children with special needs together with other children under the same roof and thus overcoming the possible isolation of children with special needs. The Convention on the Rights of Persons with Disabilities and its Optional Protocol of the United Nations (A/RES/61/106) understands specialised schools as being segregative for disabled children. SDG 4 also aims at upgrading school for inclusive education.

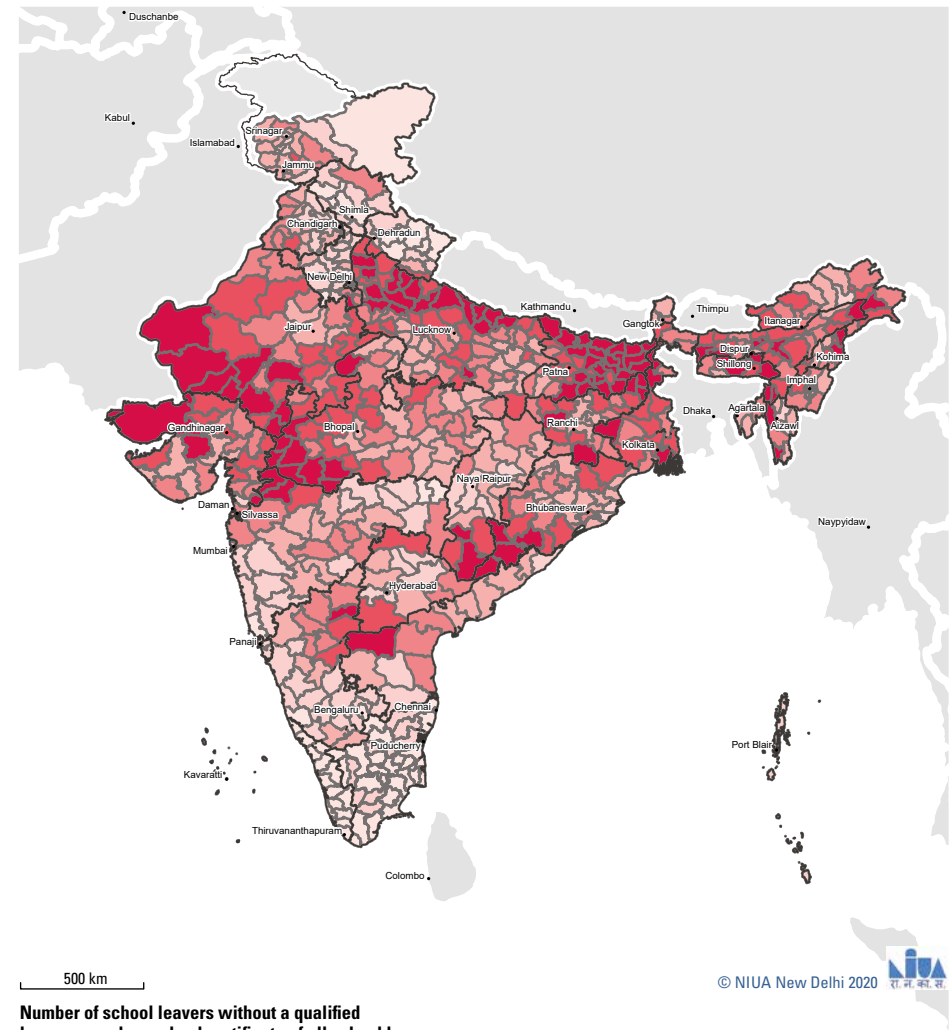
Early school leavers

Districts in the southern states like Kerala, Tamil Nadu and Karnataka as well as a few in northern states like Haryana, Punjab, Himachal Pradesh and Uttarakhand show relatively lower shares of students leaving school education without a lower secondary school-leaving certificate. In around 150 districts, on the one side, there are less than 20 % of drop-outs without a qualified lower secondary school-leaving certificate. Districts in the vicinity of cities like Thiruvananthapuram, Panaji, Bengaluru, Chennai and Puducherry – the area between Nagpur, Pune and Hyderabad – perform relatively well. On the other side, more than 50 % of drop-outs without a lower secondary school-leaving certificate are reported in 100 districts in the central, eastern and western part of India, primarily in Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh and Assam. The District of Alirajpur in

Madhya Pradesh reports with 83.2 % the highest share. These districts would need utmost attention for achieving universally valid lower secondary education.

Although the share of early school leavers before completing lower secondary education decreases, wide variations across districts exist. Several districts report a low level of attainment affecting prospects of reaching upward levels of education among adolescents. A spatial correspondence between the share of school leavers without a lower secondary school-leaving certificate in the age group of 11 to 19 years and the share of school leavers with a higher secondary school-leaving certificate (equivalent to ISCED 3) in the age group of 16 to 19 years might exist. Improving the attainment levels would be a prerequisite.

Early school leavers in India



Number of school leavers without a qualified lower secondary school certificate of all school leavers at the age of 11–19 years in percent, 2015–2016

- up to below 10
- 10 up to below 20
- 20 up to below 30
- 30 up to below 40
- 40 up to below 50
- 50 and more
- no data

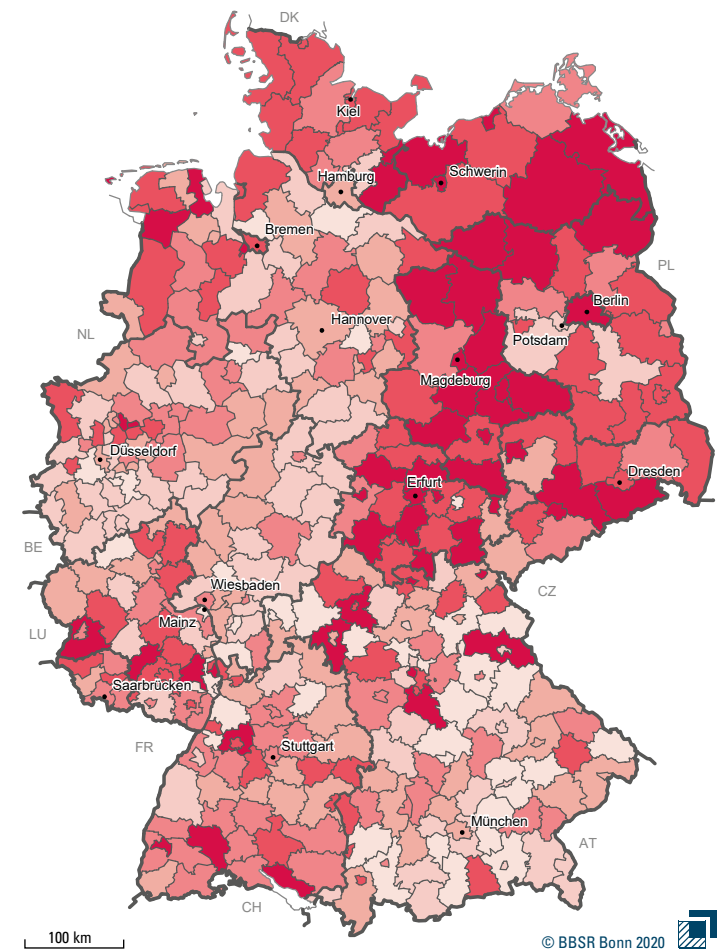
Data source: IIPS & ICF, 2017
 Data origin: National Family Health Survey 4, 2015–2016
 Geometric basis: ESRI data & maps, districts, states, union territories
 Author: NIUA Team

Disclaimer: The information on this map has been created with the highest degree of accuracy possible. However, NIUA cannot be held responsible for errors, omissions or positional accuracy. The depiction of boundaries is not authoritative.

The Länder (states) in Germany are responsible of education. Regional differences of early school leavers before completing the lower secondary education level vary amongst them. In addition, the share of early school leavers is higher in regions with a high unemployment rate and long-lasting structural economic weaknesses. The shares vary from 2.1 %

to 16.7 %. All Länder follow the strategy of leaving no one behind. The share of those not completing the secondary education level decreased from 9 % in 1995 to 6.5 % in 2017. 44 % of all early school leavers had attended specialised schools, a share which is decreasing (Autorengruppe Bildungsberichterstattung 2020: 144).

Early school leavers in Germany



Number of school leavers without a qualified lower secondary school certificate of all school leavers in percent, 2017

- up to below 4
- 4 up to below 5
- 5 up to below 6
- 6 up to below 7
- 7 up to below 9
- 9 and more

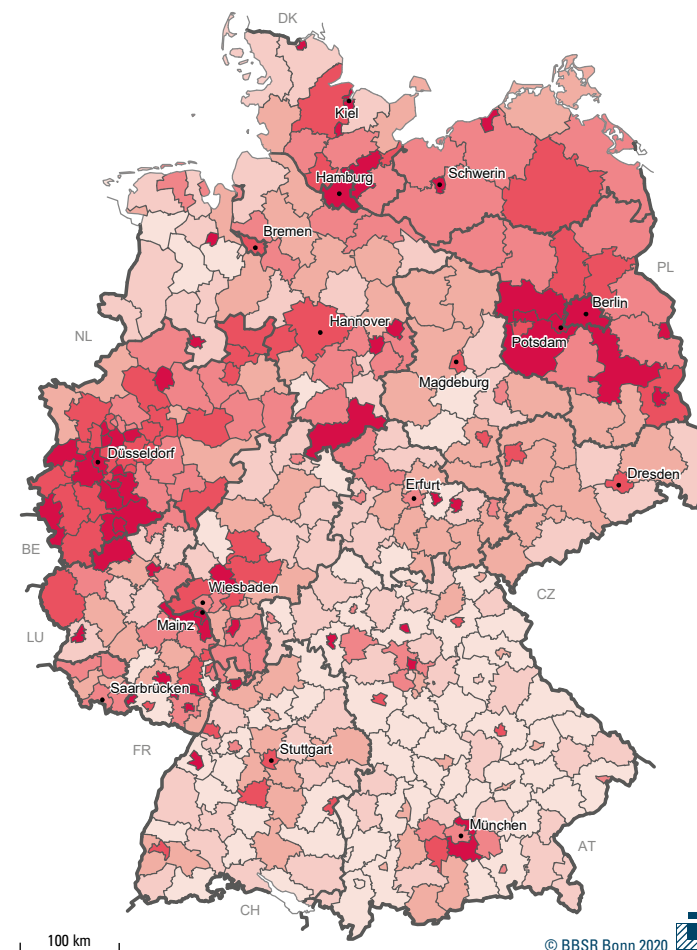
Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: counties (generalised borders),
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 Author: A. Milbert

School leavers with higher education entrance qualification

Almost 40 % of graduates complete school in Germany at the higher secondary education level. This rate has increased by 10 % since 2006. Although the trend towards higher secondary education apparently continued for many years, the current figures remain stable for the first time (Autorengruppe Bildungsberichterstattung 2020: 143). Nearly 75 % of all graduates of the higher secondary education level enter in fact

an academic education at a university (Autorengruppe Bildungsberichterstattung 2020: 184). This rate has been constant over the last 25 years. Urban districts show a higher share of higher qualified school leavers. In some Länder (Brandenburg, Mecklenburg-West Pomerania and North Rhine-Westphalia), the share of graduates of the higher secondary education level is higher in general.

School leavers with higher education entrance qualification in Germany



Number of school leavers with higher secondary school certification (ISCED 3) of all school leavers in percent, 2017

- up to below 25
- 25 up to below 30
- 30 up to below 35
- 35 up to below 40
- 40 up to below 45
- 45 and more

Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: counties (generalised borders),
 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

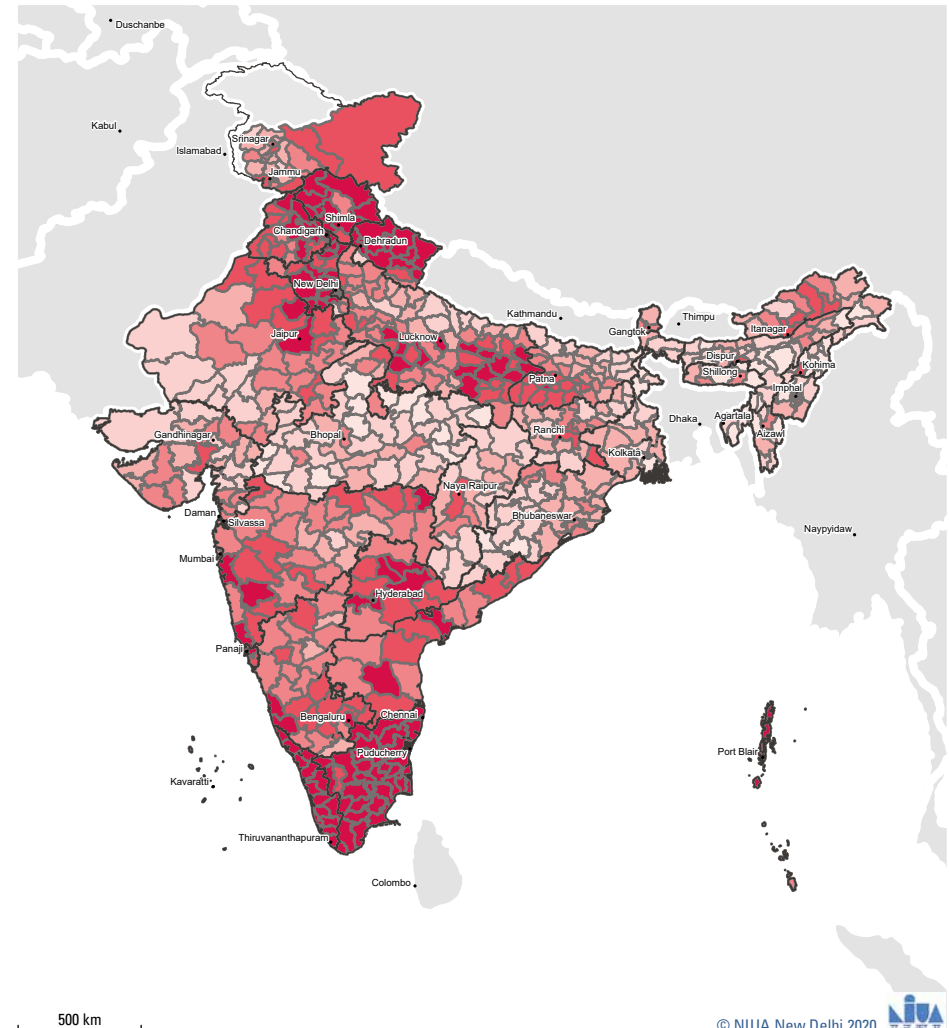
Completing higher secondary education (equivalent to ISCED 3) constitutes a vital stage for entering academic studies everywhere. A large number of students drop out also at this stage as they pass the legally recognised age for entering the labour market in India. Around half of all students (46.6 %) in the age group between 16 and 19 years leave school with a higher secondary school-leaving certificate while the other half either continues studying at the same level or drops out before reaching that level. As the age of 16 years is the corresponding age for entering higher secondary education, the age group between 16 and 19 years constitutes the basis. The upper limit of 19 years is equivalent to the preponderance of over-age education.

The 4th round of the National Family Health Survey (NFHS) (2015–2016) shows that the share of school leavers with a higher secondary school-leaving certificate within the age group between 16 and 19 years is of wide variations across districts. More than 80 % of school leavers attained a school-leaving certificate of higher secondary education in approximately 20 districts, particularly in Kerala but also

in Tamil Nadu, Himachal Pradesh and Uttarakhand. Districts in the central belt of India, basically those around Gandhinagar, south of Jaipur, north of Raipur, Kolkata and Ranchi, do not perform well. This zone of low performance extends also to the northeastern region. Around 50 districts show a share of less than 20 % of school leavers with a school-leaving exam of higher secondary education. Districts at the bottom line of the ranking based on performance mostly lie in the northeastern states, such as Assam, Meghalaya, Nagaland and Tripura, and in one central state, Madhya Pradesh.

This spatial pattern coincides to a certain extent with the regional development pattern of India. The underdevelopment in the central belt and in the northeastern states drags obviously down the attainment level in education. The rampant share of drop-outs after having completed secondary education is due to a failure in studying, an inability to afford out-of-pocket expenditures for higher-level education, the engagement as child-worker to supplement the family income as well as child-marriage amongst female students.

School leavers with higher education entrance qualification in India



Number of school leavers with higher secondary school certificate (ISCED 3) of all school leavers at the age of 16–19 years in percent, 2015–2016

- up to below 10
- 10 up to below 20
- 20 up to below 30
- 30 up to below 40
- 40 up to below 50
- 50 and more
- no data

Data source: IIPS & ICF, 2017
 Data origin: National Family Health Survey 4, 2015–2016
 Geometric basis: ESRI data & maps, districts, states, union territories
 Author: NIUA Team

Disclaimer: The information on this map has been created with the highest degree of accuracy possible. However, NIUA cannot be held responsible for errors, omissions or positional accuracy. The depiction of boundaries is not authoritative

Students

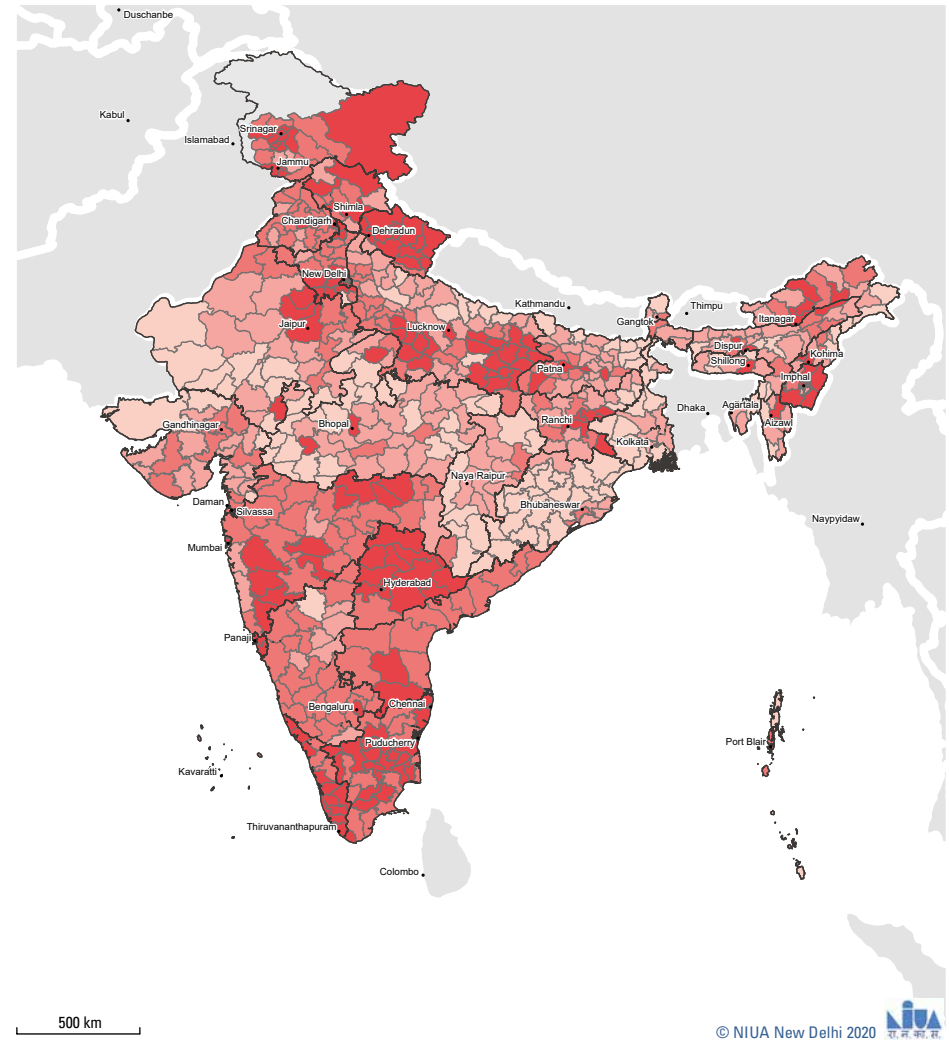
Students in India

BBSR-Analysen KOMPAKT 13/2020

Colleges for academic studies are affiliated in India to universities. After completing higher secondary education in schools (equivalent to ISCED 3) students enter colleges. 17 students per 100 people of the age group between 18 and 24 years attended on average colleges in 2011. This figure says less than the number of students closing higher secondary education. Around 350 districts report less students in colleges compared to the national survey. There are 10 or less students in colleges per 100 people of the age group between 18 and 24 years in 122 districts, primarily in Assam, Bihar, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, West Bengal, Meghalaya and Nagaland as well as the Union Territory of Andaman & Nicobar Islands. The central belt of the country, which stretches from Odisha and West Bengal as well as extensions to Assam, also identify a very poor performance. This is also the region where the share of school leavers of the age group between 11 and 19 years with a school-leaving certificate of higher secondary education is relatively small compared to districts in other areas of India.

Urban districts show a better performance of attending college education than their

rural counterparts. Districts in and around cities like Delhi, Jaipur, Chandigarh, Lucknow, Patna, Mumbai, Panaji, Hyderabad, Chennai, Bengaluru and Puducherry report a relatively better performance. Attending college education and urbanisation are closely interlinked. A total of 165 districts show 20 or more college students per 100 people of the age group between 16 and 24 years. A similar performance is noticed in most districts in Kerala, Tamil Nadu and Uttararkhand as well as in most districts surrounding the City of Hyderabad. The District of Hyderabad accommodating the City of Hyderabad shows the highest share or college attendance with 35 students per 100 inhabitants of the age group between 16 and 24 years. The overall spatial pattern of college attendance widely follows the pattern of the share of school leavers with a school-leaving certificate of higher secondary education and those without a school-leaving certificate of lower secondary education. Spatially associating these indications would be obvious. Encouraging students of lower secondary education to move onwards to college education would be needed in an integrated way in India in order to improve college attendance.



Number of students at college per 100 inhabitants at the age of 18–24 years, 2011

- up to below 10
- 10 up to below 15
- 15 up to below 20
- 20 and more
- no data

Data source: Office of the Registrar General & Census Commissioner
 Data origin: Population Census of India, 2011
 Geometric basis: ESRI data & maps, districts, states, union territories
 Author: NIUA Team

Disclaimer: The information on this map has been created with the highest degree of accuracy possible. However, NIUA cannot be held responsible for errors, omissions or positional accuracy. The depiction of boundaries is not authoritative.

In 2017 almost 16 million students attended universities in the now 27 EU Member States, representing almost 47 % of all those belonging to the respective age group of up to 25 years. In relation to the national delineation of the student quota varying widely in the countries it ranges from 65 % in Finland to 12 % in Luxembourg.

In some countries, the number of students outranges the number of inhabitants due to varying registration systems.

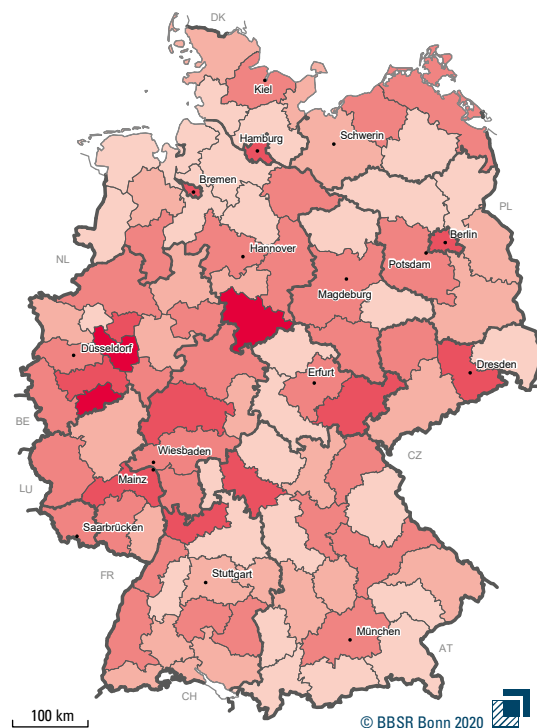
The total number of students in Germany increased from 133,000 in 1953 to 1.3 million in 1983 and doubled to 2.9 million in 2018. More and more professions require a university degree or one of a university of applied sciences – a process that is also known as the so-called academisation of professions.

Despite a decentralisation strategy which took place in Germany in 1960th and 1970th, not every county is home to a university. Additionally, most universities are located in middle-sized and large cities of higher central order.

Reporting on the number of students is usually carried out in Germany in the context of functional regions – the so-called spatial planning regions. In

general, urban regions show a higher rate of students than rural regions. 10 % of all students are from abroad with a share increasing (Autorengruppe Bildungsberichterstattung 2020: 193).

Students in Germany

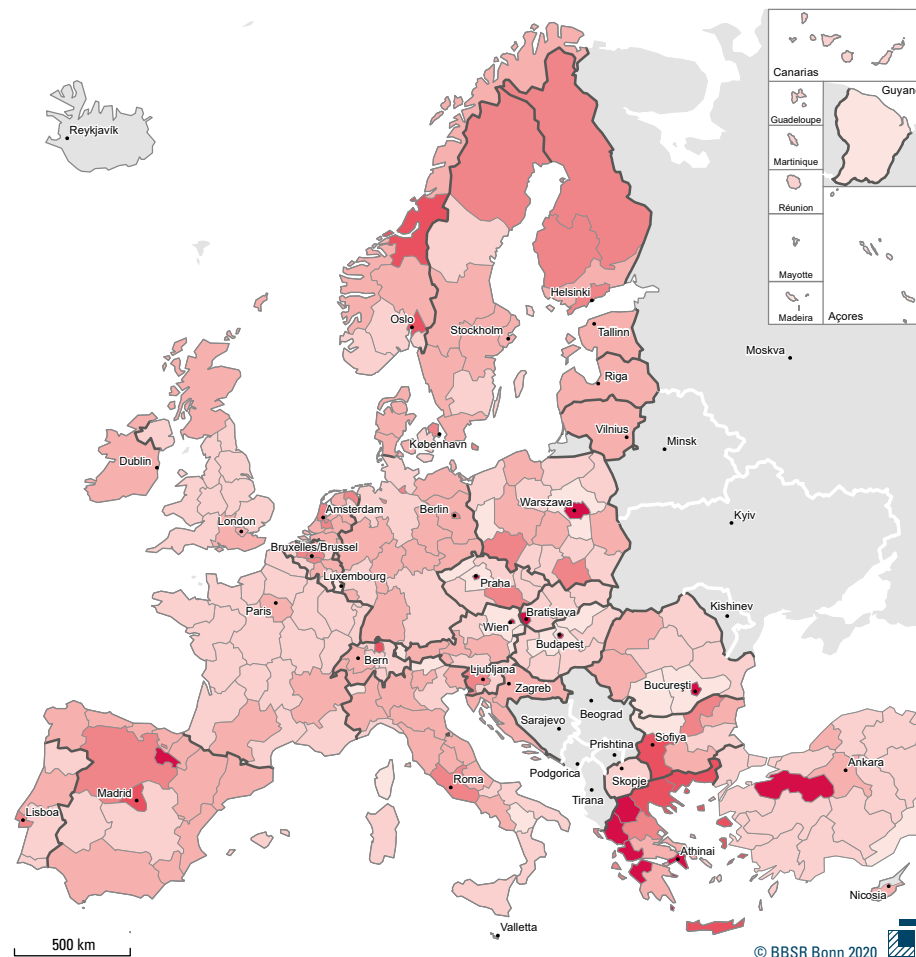


Number of students at universities and universities of applied sciences per 100 inhabitants at the age of 18–24 years, 2017

- up to below 15
- 15 up to below 30
- 30 up to below 45
- 45 up to below 60
- 60 and more

Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: spatial planning regions (generalised borders), 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

Students in Europe



Number of students enrolled by tertiary education (Bachelor's, Master's or Doctoral level or equivalent) per 100 inhabitants at the age of eighteen to twenty-four years, 2017

- up to below 20
- 20 up to below 40
- 40 up to below 60
- 60 up to below 80
- 80 up to below 100
- 100 and more
- no data

Data Source: Spatial monitoring for Europe
 Origin of data: Eurostat
 Geometric basis: GfK GeoMarketing, NUTS 2 regions, NUTS 1 regions
 Author: R. Binot

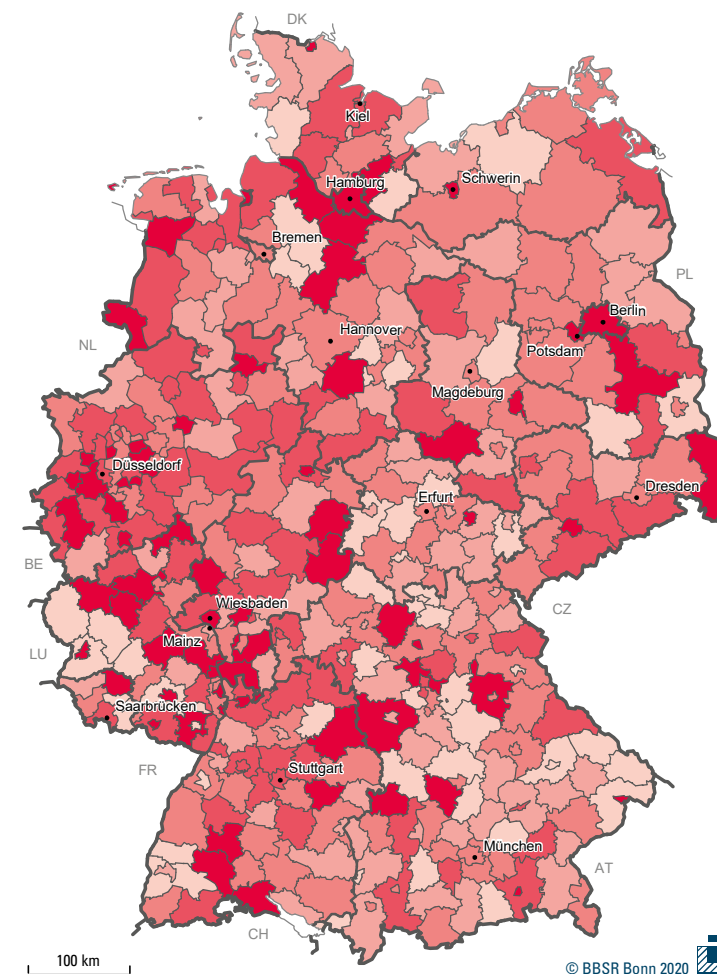
* AT, DK, MT, TR: 2016
 LT, DE, UK, IE: NUTS 1
 DE: without doctoral level

Early female school leavers

Starting with radical political reforms in the 1960th and 1970th, the participation of girls in education has increased ever since. Females have attained higher education levels than males for two decades. Only around one third of all early school leavers are female, varying from 1995 to 2017 between 35 % and 40 %. Experts explain the lower percentage of girls dropping out as manifold: girls are usually expected to be more eager in carrying through homework and frequent learning. On the contrary, boys are generally regarded as wild and inattentive and therefore missing the objectives of learning. The behaviour of females in school is rewarded – a reason why successfully completing schools is the result in most cases.

Generally speaking, the share of female early school leavers is higher in urban areas than in rural districts. Social control in rural areas might be the reason why girls are usually – and to a greater extent than boys – expected to successfully obtain school-leaving qualifications. The impact of the society on families in cities and thus the possible success of their children is lower. While leaving school without a school-leaving qualification may be explained with high unemployment rates and unsatisfactory job prospects, these factors may not be applied here.

Early female school leavers in Germany



Number of female school leavers without a qualified lower secondary school certificate of all school leavers in percent, 2017

- up to below 30
- 30 up to below 34
- 34 up to below 38
- 38 up to below 42
- 42 and more

Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: counties (generalised borders),
 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

The education of girls and young women illustrates the progress any society might make. The 4th round of NFHS (2015–2016) provides respective data on female school leavers without a qualified lower secondary school-leaving certificate in India by drawing samples from every stratum of the society of India against a nationally representative sample frame. However, many districts only cover less than 50 samples of drop-outs from school in the selected age group between 11 and 19 years. The primary reason is that there is a better access to school education leading to very few drop-outs. An inherent limitation of samples in the methodology might be another one.

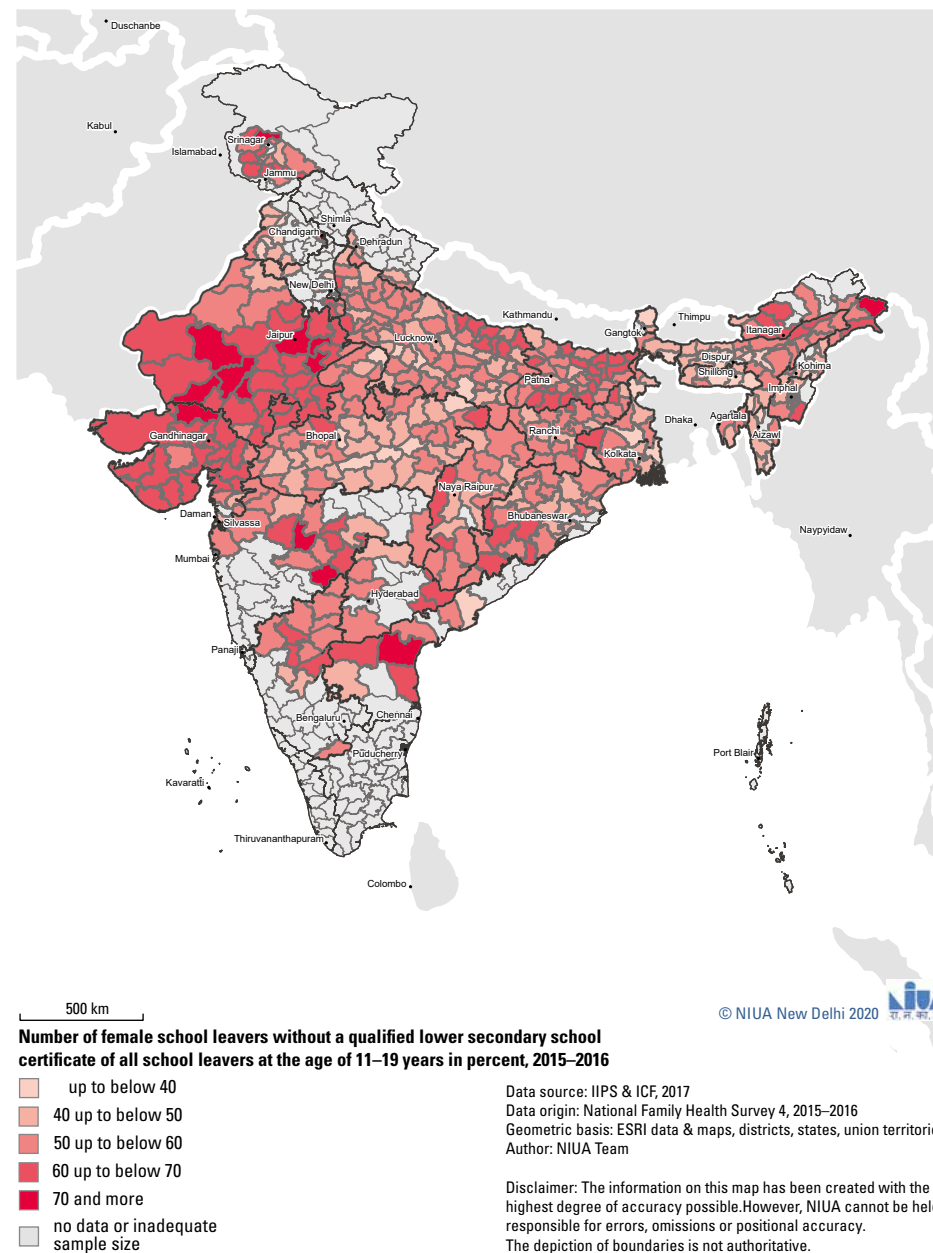
As per estimation of the 4th NFHS more than half of all school leavers (54.25 %) without a qualification of lower secondary or upper primary education in the age group between 11 and 19 years are girls and young women. The majority of districts excluded from the sampling are located in the surrounding areas of the Cities of Thiruvananthapuram, Bengaluru, Panaji, Chennai and Puducherry. Similar sampling limitations can be experienced for a few districts in Punjab, the National Capital

Territory of Delhi, Himachal Pradesh and Uttarakhand. The overall share of school leavers without a qualified lower secondary school-leaving certificate was also relatively low in these districts.

Speaking in spatial terms, clusters of districts with more than 60 % share of female school leavers out of all school leavers without a qualification of lower secondary education in the age group between 11 and 19 years were observed in the western part of India. These districts are located around the Cities of Jaipur and Gandhinagar. Altogether 125 districts show 60 % or more of females among school leavers without lower secondary education in the age group between 11 and 19 years. Only 152 out of 461 districts consider female school leavers below 50 %. Clusters of these districts are located south of the City of Lucknow and in the northeastern part of India.

Apart from the northeastern part of India, a higher gender disparity against females is reported in those districts where the overall share of school leavers is relatively high, i. e. a higher prevalence of school leavers negatively affects females more.

Early female school leavers in India



Female school leavers with higher education entrance qualification

Completing higher secondary education (equivalent to ISCED 3) constitutes a landmark, both with regard to the provision of the infrastructure of education and the normative growth of students, particularly of female ones. The supply and demand side gets visible in the same way as the opportunity cost of education becomes a major factor of influence.

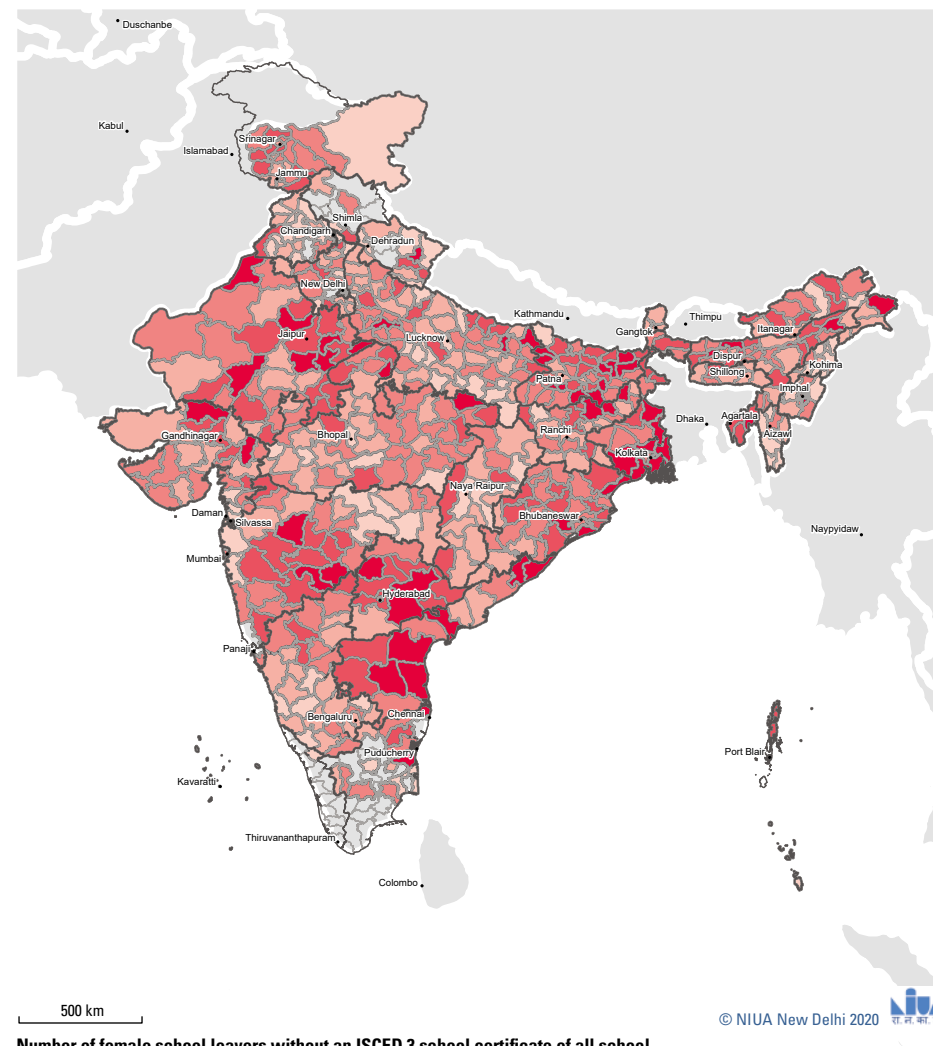
The share of females out of all school leavers without an ISCED 3 school-leaving certificate in the age group between 16 and 19 years is reported as 52.2 % at the national level of India. It varies from 21.28 % in the District of Daman of the Union Territory of Daman to 75.9 % in the District of Vizianagaram in Andhra Pradesh. The 4th round of the NFHS (2015–2016) identified 50 districts of less than 50 samples of school leavers without an ISCED 3 certificate in the age group between 16 and 19 years. This may be the result of very few school leavers completing the ISCED 3 level. Most of these districts lie in Kerala and Tamil Nadu and a few in Himachal Pradesh and Uttarakhand. These districts show a very low share of school leavers completing the ISCED 3 level.

A total of 62 districts reported on the one side a share of 60 % or more of female

school leavers while 354 districts listed a share of more than 50 % of females among all school leavers without completing ISCED 3 in the age group between 16 and 19 years. The gender disparity in these districts is against females. On the other side, 89 districts show a share of less than 45 % of female school leavers while 239 districts are characterised by a share below 50 % of females out of all school leavers without completing the ISCED 3 level. These districts obviously offer favourable conditions for the education of females.

Generally speaking, the chances of female school leavers without completing certain levels of education is relatively higher, most specially at levels such as upper secondary and ISCED 3 where board examinations are mandatory. Although a situation of equal gender disparity exists at national level, there are many groups of districts where the share of female school leavers amongst all school leavers is higher. Mainstreaming the education of females would thus require a flexible but specific policy approach considering the respective local context.

Female school leavers with higher education entrance qualification in India



Number of female school leavers without an ISCED 3 school certificate of all school leavers with an ISCED 3 certificate at the age of 16–19 years in percent, 2015–2016

- up to below 45
- 45 up to below 50
- 50 up to below 55
- 55 up to below 60
- 60 and more
- no data or inadequate sample size

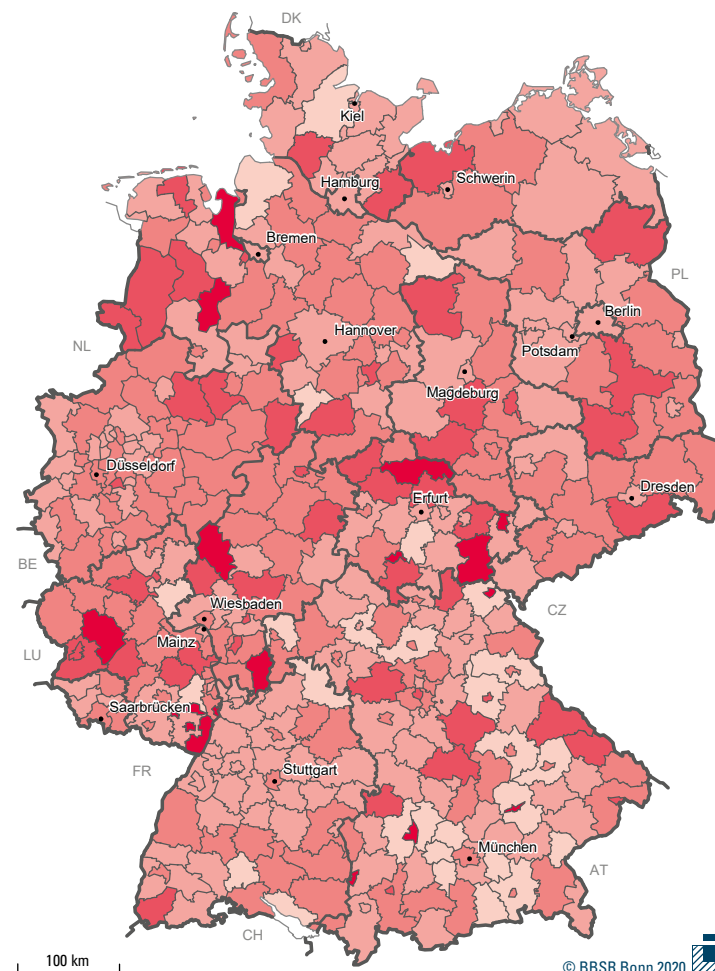
Data source: IIPS & ICF, 2017
 Data origin: National Family Health Survey 4, 2015–2016
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 Author: NIUA Team

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The proportion of school leavers with a university entrance qualification is 50 % and above in almost all districts in Germany. 54 % of all graduates with a higher secondary education are on average female, ranging from 43 % as lowest single value to 64 % as highest single one. Only some rural areas in Bavaria and a few sparsely populated districts in other areas of Germany show higher rates of male graduates than female ones. In rural areas, particularly where traditional gender roles, family structures and living roles are dominant, attending a high school depends for girls more than for boys on the spatial accessibility of the next education facility. High schools are the type of school where the general higher education entrance qualification is obtained most frequently.

Until 1918, girls had been refrained from schools. It were the educational reforms under Chancellor Willy Brandt in the 1960s that made an increasing proportion of girls from all social classes taking part in higher education. Up to the 1980s, more boys than girls had graduated with the entrance qualification for a university. The share of girls amongst high school graduates has exceeded that of boys since those days. One of the reasons for this finding may be the school-based vocational training, which is carried out more intensively for girls than for boys. As an alternative to studying at a university vocational training programmes exist (e.g. opticians, booksellers), which usually also require general higher education entrance qualifications. These jobs seem to be more attractive to women than to men.

Female school leavers with higher education entrance qualification in Germany



Number of female school leavers without an ISCED 3 school certificate of all school leavers with an ISCED 3 certificate in percent, 2017

- up to below 50
- 50 up to below 54
- 54 up to below 57
- 57 up to below 60
- 60 and more

Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: counties (generalised borders),
 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

Female students

Female students represent the majority of students at European universities. Women make up 54 % of all students in Europe with a share of 60 % in Sweden and Slovenia and 49 % in Germany.

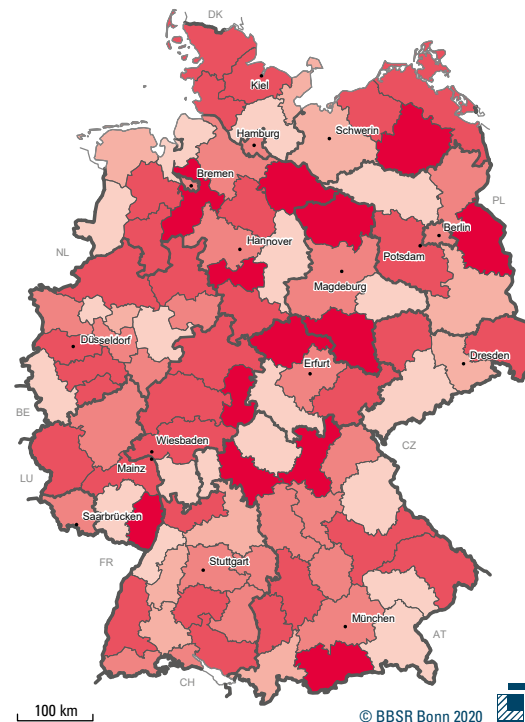
Comparing Germany to other European countries, the lower female share there shapes the spatial image: the maximum regional shares in Germany correspond to the lowest regional values in many countries. Yet, national differences of the education systems, especially related to vocational training, biases this picture.

Following the aforementioned educational reform in Germany, also the share of female students in universities increased from 26 % in 1960 to 49 % between 2017 and 2018. Considering spatial planning regions, the lowest share of female students lies at 21 % and the highest at 75 %.

Regional differences reflect the gender differences in the subjects to be studied. Women prefer, amongst others, business

administration, pedagogy, humanities and law. Regions with universities offering these subjects may have a higher proportion of women.

Female students in Germany

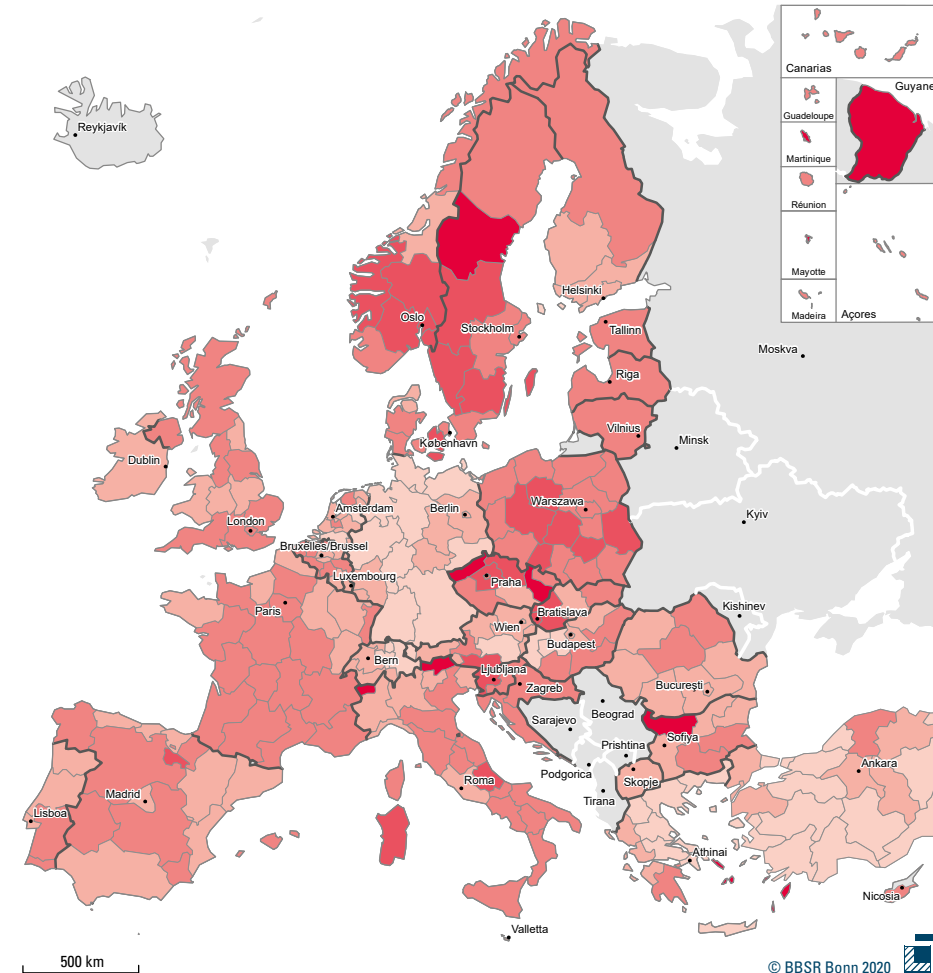


Number of female students at universities and universities of applied sciences of all students in percent, 2017

- up to below 40
- 40 up to below 45
- 45 up to below 50
- 50 up to below 55
- 55 and more

Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: spatial planning regions (generalised borders),
 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

Female students in Europe



Number of female students by tertiary education of all students in percent, 2017*

- up to below 50
- 50 up to below 55
- 55 up to below 60
- 60 up to below 65
- 65 and more
- no data

Data source: Spatial monitoring for Europe,
 Data origin: Eurostat
 Geometric basis: GfK GeoMarketing, NUTS 1 regions, NUTS 2 regions
 Author: R. Binot

* AT, DK, MT, TR: 2016
 LT, DE, UK, IE: NUTS 1
 DE: without doctoral level

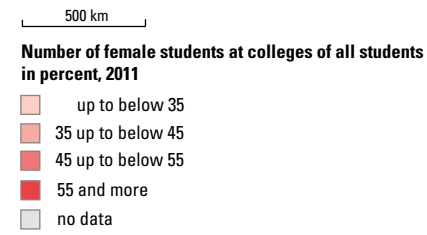
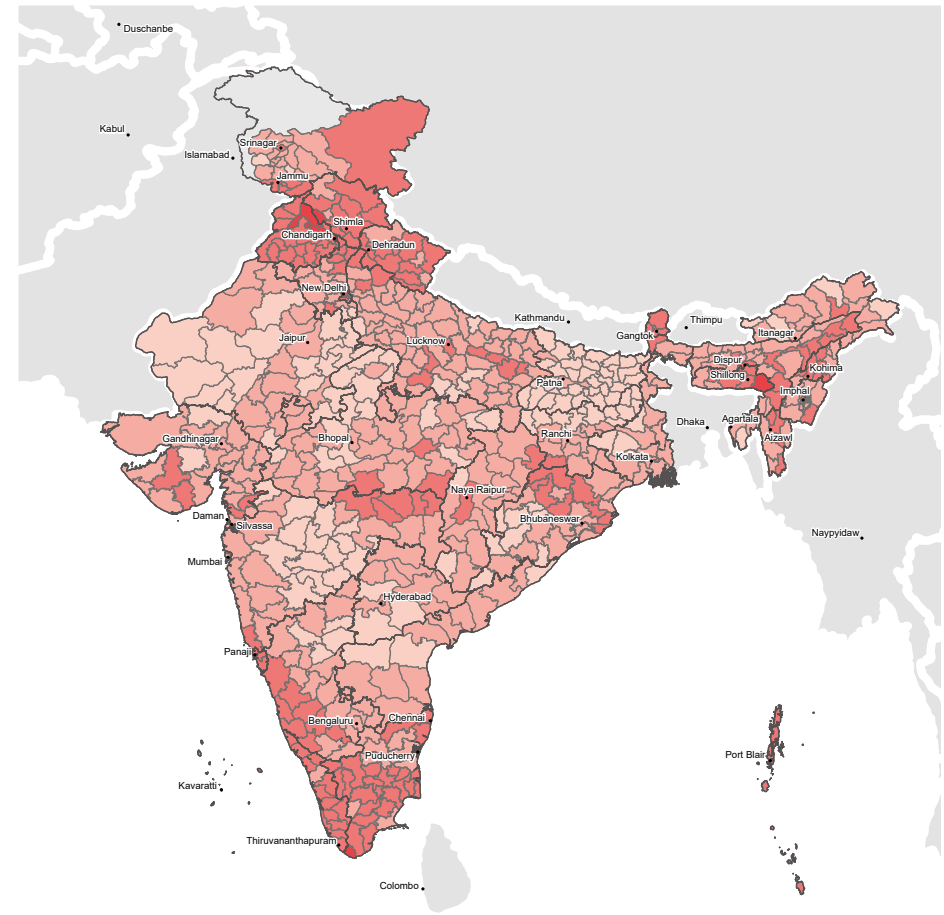
Female students in India

There are 40 women per 100 college students in India mirroring the gender disparity in the country in favour of males. The share of women attending college education is higher in the southern part of India, in districts surrounding prominent cities, in those located north of Delhi and in a few ones in the northeastern part of the country. Districts in Kerala, Tamil Nadu, parts of Karnataka, Punjab, Himachal Pradesh and Uttarakhand also report a relatively better share of women out of all college students. City-regions usually perform best in education. The central part of India, except clusters of districts around cities, show a low share of women amongst college students.

Only 54 out of altogether 640 districts were characterised in 2011 by a share of more than 50 % of women amongst all college

students. These districts are mostly located in Kerala, Tamil Nadu, Punjab, Uttarakhand, Himachal Pradesh and Meghalaya. In India, only 5 districts fall into the category of districts with a share of more than 55 % of women amongst college students. Around 135 districts show a share of less than 35 % and around 450 districts a share of 45 % of women out of the total number of college students. The inter-district gap ranges from 22.2 % in the District of Jaisalmer in Rajasthan to 59.2 % in the District of Una in Himachal Pradesh.

Given the close interlinkage between higher shares of attending college education by adolescents and considering the gender disparity in favour of girls, policy should focus on improving the attendance of both, male and female students, in college education.



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Data source: Source of the Registrar General & Census Commissioner
 Data origin: Population Census of India, 2011
 Geometric basis: ESRI data & maps, districts, states, union territories
 Author: NIUA Team

Disclaimer: The information on this map has been created with the highest degree of accuracy possible. However, NIUA cannot be held responsible for errors, omissions or positional accuracy. The depiction of boundaries is not authoritative.

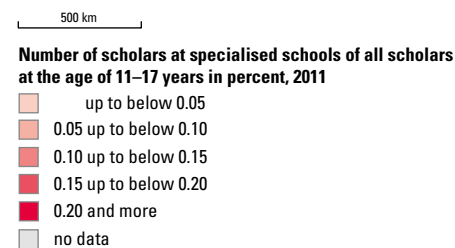
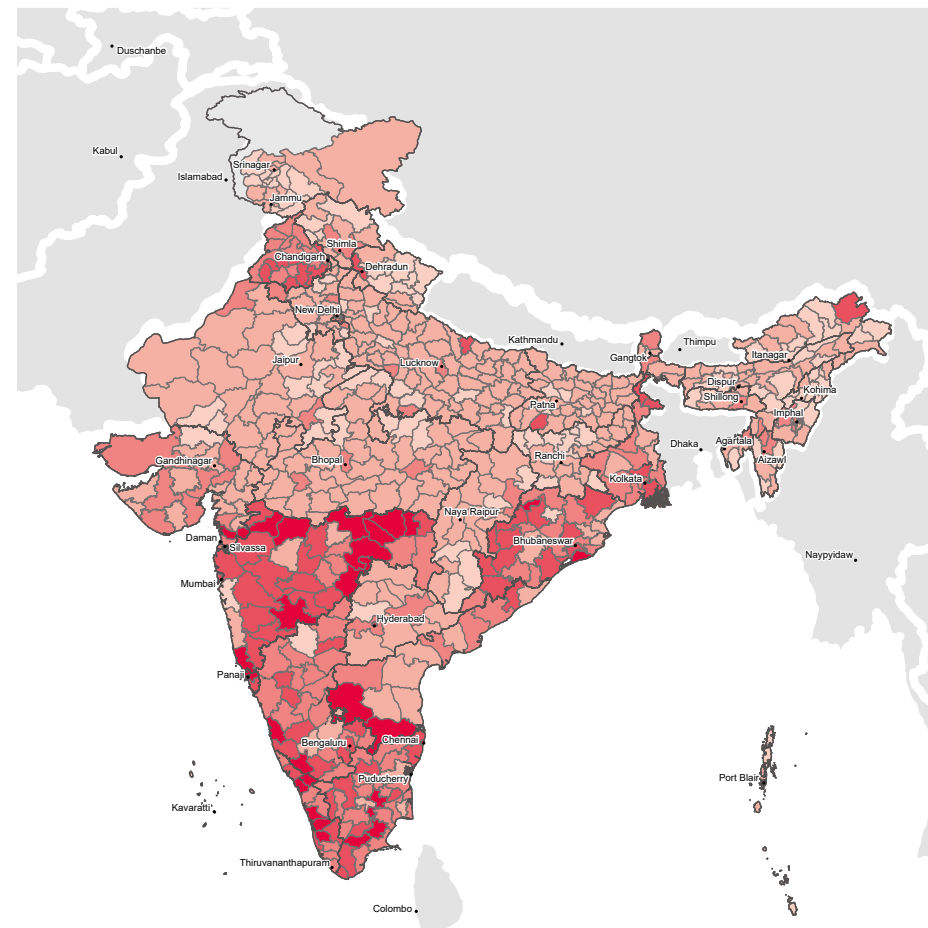
Scholar exclusion

According to the Population Census Data of India (2011), only 131,822 students (0.1 %) of the age group between 11 and 17 years attend specialised schools. Wide-ranging variations exist across the districts in India, although providing specialised teaching infrastructure along with appointing respective teachers as well as offering adequate schools exclusively for children with special need are in place in many states of the country. No child attends specialised schools in the Districts of Lahul & Spiti in Himachal Pradesh and Anjaw in Arunachal Pradesh while the highest share of students (0.56 %) attending specialised schools is reported by the District of New Delhi in the National Capital Territory of Delhi. A relatively higher concentration is observed in districts in Kerala, Tamil Nadu, Karnataka, Maharashtra and Odisha. Districts in Punjab show a relatively higher share of students at specialised schools in the age group between 11 and 17 years.

Specialised schools are generally located in India in urban centres where the share of students in these schools amongst all students higher. The central belt of the country shows a relatively lower share of students attending specialised schools. 118 out of 640 districts showed in 2011 a share of students in the age group between 11 and 17 years at specialised schools of below 0.05 % while in 424 districts the share of respective students was less than 0.10 %.

Districts with a better performance in other matters of education also show a wider attendance of specialised schools. This correlation may be found in Kerala, Tamil Nadu and Karnataka where drop-outs without a school-leaving certificate of lower secondary education is relatively low and attending specialised schools performs slightly better.

Scholar exclusion in India



Data source: Source of the Registrar General & Census Commissioner
 Data origin: C10 table, Population Census of India, 2011
 Geometric basis: ESRI data & maps, districts, states, union territories
 Author: NIUA Team

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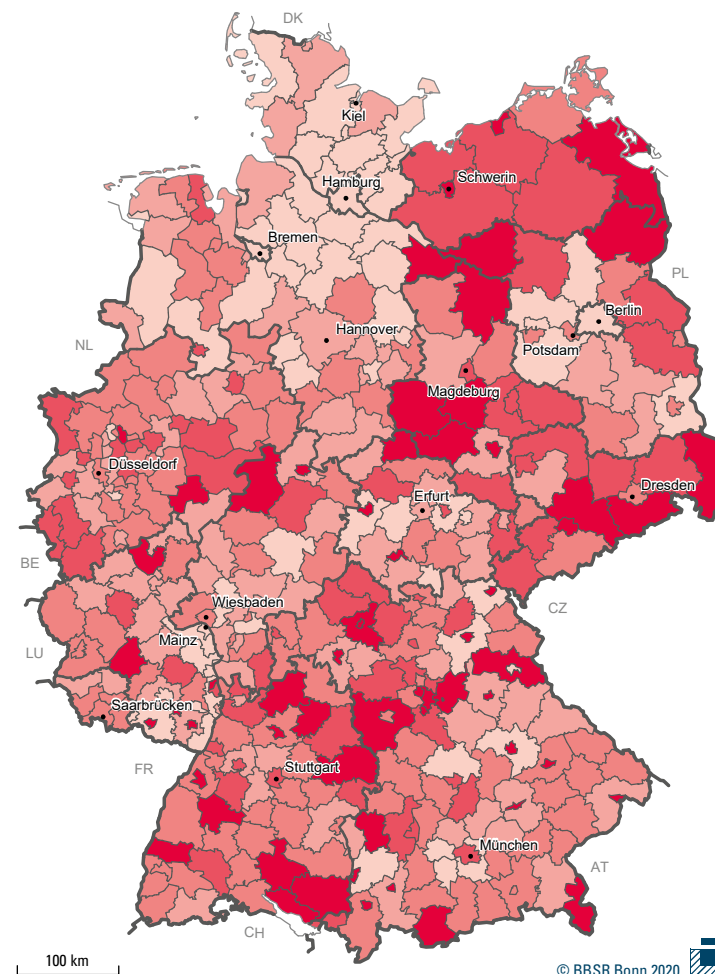
Germany has ratified the Convention on the Rights of Persons with Disabilities and its Optional Protocol of the United Nations. Traditionally, disabled children had attended specialised schools. As member states of the United Nations are responsible for implementing UN Agreements and education is at the same time a subject of responsibility of the Länder, Germany had started late and with various concepts on the Länder level to open regular schools for disabled persons. In all Länder, inclusive regular schools and specialised schools are in operation. Funds are provided for upgrading regular schools.

Between 2008 and 2009 and 2018 and 2019, the Länder transformed inclusive teaching at different levels: Bremen reduced the share of pupils in specialised schools from 61 % to 11 %, Berlin from 60 % to 29 %, Brandenburg from 64 % to 51 % and Bavaria from 83 % to 71 %, to

mention a few examples (Autorengruppe Bildungsberichterstattung 2020: 117). Regional differences mirror the variations at Länder level as well as the location and accessibility of specialised schools in addition.

The Länder in Germany define different criteria for specialised schooling. The separation in specialisation already starts when entering primary schools in Bavaria, Hesse and Rhineland-Palatinate. Switching from a specialised school to a regular school is less probable in most Länder. The switch in both directions is equally possible only in Lower Saxony, Saxony and Saxony-Anhalt (Autorengruppe Bildungsberichterstattung 2020: 117). Taking into account that most pupils of specialised schools leave these schools without graduating at lower secondary level, these findings may be seen as critical.

Scholar exclusion in Germany

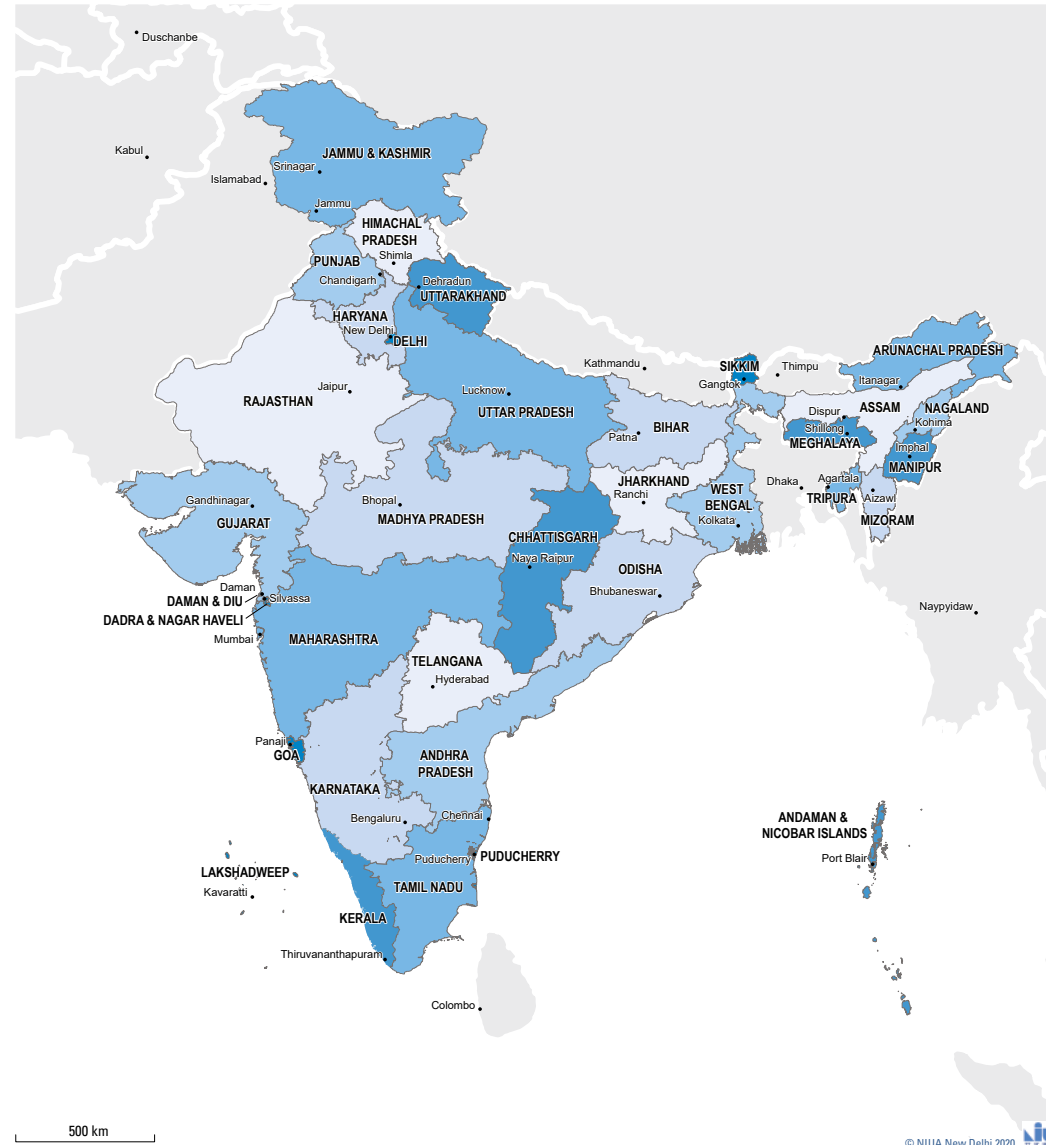


Number of scholars at specialized schools (ISCED 2 / ISCED 3) of all ISCED 2 / ISCED 3 level scholars in percent, 2017

- up to below 2.5
- 2.5 up to below 3.5
- 3.5 up to below 4.5
- 4.5 up to below 5.5
- 5.5 and more

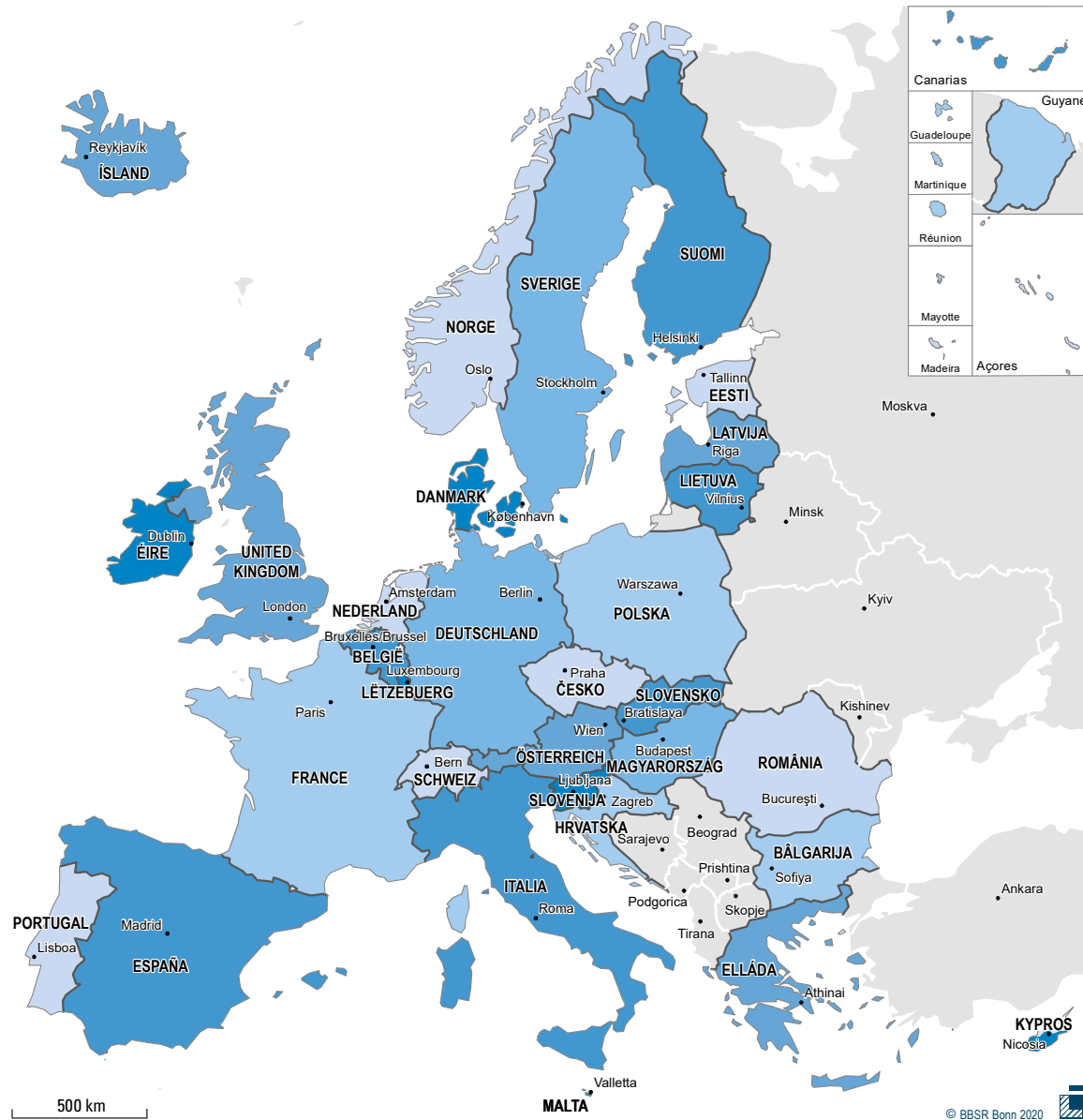
Data source: Spatial Monitoring System of the BBSR
 Data origin: Federal Statistical Offices
 Geometric basis: counties (generalised borders),
 31.12.2017 © GeoBasis-DE/BKG
 Author: A. Milbert

States, capitals and union territories in India



© NIUA New Delhi 2020
Geometric basis: ESRI data & maps, districts, states, union territories
Author: NIUA Team
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States and capitals in Europe



Conclusion

This joint publication is a significant follow-up milestone of the cooperation between BBSR and NIUA in the context of the urbanization partnership closed between the responsible ministries in India and Germany. Its underlying common understanding of analysing spatial structures as well as the collaboratively intercultural cooperation of both institutions shows that the envisaged blueprint of joint spatial research in the area of urban and spatial development might be of added value for both, methodological approaches and policy advice.

The joint analysis compares the spatial structures that SDG 4 on Quality Education produces on the lowest common data level possible in India, Germany and Europe and develops a common visual language, partly with variations. Taking early school leavers, school leavers with higher education entrance qualification and students, early female school leavers, female school leavers with higher education entrance qualification and female students as well as scholar exclusion as a first set of thematic details, the joint approach also illustrates how spatial analysis might be applied to reveal

the situation on the ground in regions and cities. Not really surprising matters the size, the function and the relative wealth of a city: a larger city would show another spatial picture than a medium-sized city, a small town or a rural municipality. In the same way, it would need a different response by decision-makers than for other types of settlements.

For both, developing and developed countries, the educational level of the population is central to the future development of the society. The selected indicators on education consider the success of secondary education and the subsequent participation in tertiary education. Despite all differences in the various education systems, this output is easily comparable. It shows when and where pupils drop out of the education system. Every subsequent qualification at a later age is associated with higher opportunity costs. Access to higher education obviously depends also on local conditions. In both, Germany and India, school leavers with a general university entrance qualification are higher in numbers in cities than in rural areas – a fact that applies particularly to girls.

Clarification on the appropriate reference level for these indicators is still needed. Choosing the proportion of school leavers with and without degrees of higher education in relation to all school leavers is a specific view taken by Germany and its education monitoring system. The alternative relationship to age groups would not be an easy either: the proportion of early school leavers would have to be referenced against the age group, which is still largely involved in school education or prepares for a higher secondary school leaving certificate. Further analysis and different data would be needed to develop the best comparable indicators in terms of international and sub-national terms.

Cities take a prominent role in education, as they are places of institutions of higher education. However, the number of students and share of female students illustrate qualitative differences in the location of universities. Universities subsequently might have a different relevance for the development of regions. Many options exist in this field for the political arena on national and regional level to promote education.

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Source: UNO 2020

Published by

Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR) within the Federal Office for Building and Regional Planning (BBR)
Deichmanns Aue 31–37
53179 Bonn

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Typesetting and layout

Yvonne Groh

Printed by

Federal Office for Building and Regional Planning, Bonn

Orders from

beatrix.thul@bbr.bund.de
Stichwort: BBSR-Analysen KOMPAKT 13/2020

The BBSR series „Analysen KOMPAKT“ is published irregularly. They can be ordered free of charge.

ISSN 2193-5017 (print version)
ISBN 978-3-87994-770-6

Bonn, 2020

“BBSR-Forschung-Online“ newsletter

The German-speaking BBSR newsletter informs every month about new publications, internet articles and events of the BBSR.
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Information

This publication is accompanied by two other publications on SDG 3 (11/2020) and SDG 11 (15/2020). The chapters visualise the spatial analysis of SDG 4. Alternating maps illustrate the spatial perspective on SDG 4 in India, Germany and Europe by taking national as well as supranational views wherever feasible. The colour code used follows the choice of the United Nations, which assigned a reddish colour to SDG 4. Two general maps in bluish colour-facets complete the sequence of maps. They serve the purpose of a map-reading guidance and cover Europe and India in administrative terms showing their respective states and capitals, in the case of India also its union territories.

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