The Outlook on Higher Education in Turkey

2020

MONITORING AND EVALUATION REPORT

THE OUTLOOK ON HIGHER EDUCATION IN TURKEY 2020

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THE OUTLOOK ON HIGHER EDUCATION IN TURKEY 2020

MONITORING AND EVALUATION REPORT

Bekir S. Gür
Serkan Yurdakul

PREFACE

The existing higher education system in a country contributes to the economic, social and cultural life of its citizens as well as the country's economic and social development. Therefore, it is necessary to determine to what extent the investments made in higher education are successful and to monitor the efficiency and effectiveness of growth in the higher education system. In order to achieve this, it is necessary to monitor the higher education system with up-to-date data and to determine to what extent the defined goals and objectives have been achieved. As Eğitim-Bir-Sen, Turkey's largest education trade union and civil society organization we have taken on the responsibility of undertaking this study which we find to be extremely important in our series of report on education in Turkey. We undertook a comprehensive analysis of the higher education system in *The Outlook on Education in Turkey 2017: Monitoring and Evaluation Report,* the first of which we published in 2017. This series of reports were continued in 2018 and 2019. For the first time in Turkey, we have carried out reports on an annual basis which aim to monitor and evaluate the higher education system. As part of this endeavor, we have put out *The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report* to offer an assessment of the current situation and provide an analysis of the higher education system.

The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report has been prepared using the standards of international organizations and observing the principle of data-based analysis. The report has been presented with a perspective that reflects the process analysis and observes the changes in higher education with regards to both content and methodology. *The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report* aims to aid in the establishment of a higher quality, more effective and efficient higher education system. The report offers content that will direct the current path of higher education in the country.

I believe that this report, which was prepared with the agenda of higher education policy in mind, will no doubt be beneficial to the current state of higher education in Turkey as well as the higher education community as a whole. I hope that as a result of this report, the decision-making processes on higher education will become more participatory, responsive to the demands of the public, and data-driven. Lastly, I would like to express my gratitude to our research team who prepared the report and to the institutions that offered us data for the report.

Ali Yalçın
President of Eğitim-Bir-Sen and Memur-Sen

FOREWORD

Higher education is a fundamental component of our education system as it offers an expression of the research-based inclinations of society. In order for our nation to make more confident and stronger leaps in every field, the quality of our universities must be increased. Thus, for the improvement and development of the education system as a whole, it is important to address the current situation of our universities in every aspect. To serve this purpose, we aim to offer objective judgments and underline the importance of the principles of trade unionism in context of higher education in Turkey. We offer valuable suggestions that will be helpful to relevant institutions and organizations.

As Eğitim-Bir-Sen we have published our *Outlook on Education in Turkey report* series in 2017, 2018, and 2019, which shed light on the changes that took place during this period and provided constructive suggestions. *The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report* was prepared using both international (UNESCO, OECD, SJR etc.) and national (YÖK, MEB, TURKSTAT, KYK) data sources. In this report, differences between provinces, regions and institutions have been dealt with in a national context, whereas differences between countries have been analyzed with an international perspective. Some changes have been made in terms of content compared to the indicators of the previous year. In our report this year, there are seven chapters under the following headings: transition to higher education, access to and participation in higher education, education outputs, academic staff, educational environments, financing of higher education, and academic and innovation performance of universities.

This report, which discusses the current state of the higher education system, aims to achieve the improvement and development of the higher education system as a whole. We hope to contribute to the solution of the problems outlined in this report and to the creation of more efficient and effective policies. I would like to take this opportunity to specially thank Dr. Bekir S. Gür and Serkan Yurdakul for their contributions to this report.

Atilla Olçum
Vice Chairman

Table of Contents

List of Tables, Figures and Maps

List of Acronyms and Abbreviations

ASELSAN	Military Electronics Industries
GDP	Gross Domestic Product
GSB	Ministry of Youth and Sports
KYK	Credit and Dormitories Institution
MEB	Ministry of National Education
OECD	The Organisation for Economic Co-operation and Development
ÖSYM	Assessment, Selection and Placement Centre
ÖSYS	Student Selection and Placement System
PCT	Patent Cooperation Treaty
R&D	Research & Development
TÜBİTAK	Scientific and Technological Research Council of Turkey
TURSTAT	Turkey Statisticial Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States
WIPO	World Intellectual Property Organization
YKS	Higher Education Examination
YLSY	Selecting and Placing Candidates to be Sent Abroad for Graduate Study
YÖK	Council of Higher Education

INTRODUCTION

Both developing countries and developed countries invest heavily in higher education. The main reason for this is that higher education plays an indispensable role in the development of countries. Countries invest in higher education to stimulate economic growth, increase productivity, contribute to personal and social development, and reduce social inequalities, among other reasons (OECD, 2020). The fact that higher education graduates earn higher income and generally have better living conditions has led to a global increase in the demand for higher education. In line with this trend, the demand for higher education continues to increase in Turkey. Given the increasing demand for higher education, higher education institutions and policy makers face new challenges in providing adequate quotas and making changes to existing ones.

At the beginning of 1990 and in the period after 2006, Turkey has made significant investments in higher education. As a result of these investments, the number of higher education institutions and teaching staff has increased and access to higher education has increased. However, Turkey has been experiencing a halt in this access to higher education in the last few years. Only as of 2020 has Turkey has been able to once again achieve the number of candidates placed into higher education programs as in 2014. When compared to other Organisation for Economic Co-operation and Development (OECD) countries, Turkey has a lower higher education schooling rate as well as a lower number of students per faculty member. This means that Turkey is lacking with regards to higher education faculty members and this problem needs to be solved. Turkey is endeavoring to achieve two important and difficult objectives, to increase both access to higher education and the quality of higher education.

In order to evaluate the higher education policies in Turkey in a sound manner, a data-driven and independent approach is needed. The main objective of the *Outlook on Education in Turkey* report series is to assess the current state and trends of the higher education system in Turkey and to review and evaluate data on the basis of a holistic and comprehensive manner alongside international comparisons. *The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report* provides a comprehensive review of the indicators of the current higher education system, clearly revealing the state of the system, its trends and possible areas of intervention and improvement. Thus, there is a substantial set of indicators of the course of higher education policy in Turkey which have been evaluated independently. We believe that the report will be highly beneficial for those in decision-making positions and researchers who want to survey the current state of higher education in Turkey in a scientific and objective manner.

Objective and Scope

The Outlook on Education in Turkey 2020: Monitoring and Evaluation Report consists of seven chapters: transition to higher education, access to and participation in higher education, education outputs, academic staff, educational environments, financing of higher education, and academic and innovation performance of universities. Indicators that will answer various questions are included in each section. Each indicator is supported by figures, tables and maps based on relevant data. Considering the experience gained from previous reports and the characteristics of the data collected, some indicators were added while others were removed, and the section entitled *Transition to Higher Education* was added as the first part of the 2020 report. It is important to note that many indicators have been upheld in order to provide for a sounder comparison with previous years. For the sake of readability, some indicators in the report have been included at intervals of several years.

Method

This report contains the quantitative research methods of descriptive research. Data has been added on to existing data and those with strategic potential as contributing to the creation and development process of higher education policy in Turkey have been identified. The research is both cross-sectional and longitudinal, as it examines trends from past to present. In data analysis, figures and maps were also used along with tables. Among the techniques used are mainly rate statistics, frequency and percentage distributions, central trend measures, and cross-tab analysis for comparisons between categories. In addition, the years in all tables and figures represent the beginning of the school year. For example, data for the 2019-2020 academic year is shown as 2019 in the tables and figures. With regards to data on graduation, the last year of the academic year is taken as a reference. In other words, those who graduated at the end of the 2018-2019 academic year are shown as 2019. In *The Outlook on Education in Turkey 2020* data in the indicators were mainly formed to cover the last five years / academic year. On some indicators, three dates were considered in five-year periods (2009, 2014 and 2019). In the first stage, the data were updated to cover the last five years and / or for five-year periods (2009, 2014 and 2019) to reveal the latest situation in the current indicators. Existing data on the updated indicators was compiled or collected from the published reports and websites of relevant institutions and organizations. In this process, data from institutions and organizations and a wide variety of sources were compiled and prepared for analysis. In the second stage, the presentation and analysis techniques of the data suitable for the evaluation of these indicators were updated and selected. In previous reports, universities were divided into three waves (before 1992, 1992-2005, 2006 and after) according to their foundation years. This classification has been preserved as is. However, as a result of the division of some universities into separate entities in 2018, all of the newly established universities have been categorized under the wave where the original university was placed, not in the third wave. The reason for this is that almost all of the divided universities have emerged as an institutionalized structure in terms of both the number of students and teaching staff and their educational environments (e.g. Istanbul University-Cerrahpaşa). The number of universities established and divided in

the first wave (before 1992) was 36, in the second wave (between 1992-2005) the number of universities was 31, and the number of universities established in the third wave (2006 and after) was 62. Therefore, 8 of these 16 newly established universities were classified under the first wave, 6 in the second wave and 2 in the third wave.

In order to prevent material errors that may arise in the compilation and analysis of the data, the analysis and data were controlled by the research team. Any data that appeared to be inconsistent during the analysis / interpretation phase was determined and reviewed by the research team, and finally, the table / figure / maps were compared with the main text during the final reading and editing process to ensure the internal consistency of the text.

Primary Data Sources

The data used and updated in the *Outlook on Education in Turkey* reports were obtained from a wide variety of sources. The primary data source consists of data in the Higher Education Statistics Book published annually by the Measurement, Selection and Placement Center (ÖSYM) between 1997 and 2012 and the data compiled from the Higher Education Information Management System on the website of the Council of Higher Education (YÖK). In addition to this, data published annually by the Ministry of National Education (MONE, 2020), Youth and Sports Ministry (GSB), Higher Education Credit and Hostels Institution (KYK) data obtained from the General Directorate of Treasury, data obtained from the Ministry of Finance website, Turkey Official data obtained from the Scientific and Technological Research Council (TÜBİTAK) website and Activity Reports were updated and used in many indicators. Furthermore, data from the Turkey Statistical Institute (TURSTAT) 's database concerning unemployment and employment statistics, education spending statistics, education statistics according to age groups and regions were used. Therefore, all of the data has been compiled from various open sources. The main data sources used in international comparisons have been Education at a Glance and the UNESCO database, which is published annually by the Organisation for Economic Development and Cooperation (OECD, 2020). World Intellectual Property Organization (WIPO) patent application statistics, SCIMAGO and ULAKBİM databases are among the main data sources used to reveal the academic and innovation performance of countries and universities.

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EXECUTIVE SUMMARY

Chapter A: Transition to Higher Education

While the total number of graduates from secondary education was 950 thousand in 2015, this number increased to 1 million 50 thousand by 2019. The three countries which increased their high school graduation rate the most from 2010 to 2017 respectively are, Turkey (21% points), Spain (20% points) and Mexico (16% points). As a result of compulsory education being increased to 12 years in 2012, there was a rapid increase in Turkey's high school graduation rate. However, Turkey still has on the lowest high school graduation rates (75%) amongst the OECD countries as of 2017. We can conclude that the success achieved in enrollment in secondary education cannot be achieved upon graduation from secondary education.

In 2011, the number of candidates applying to higher education was 1,759,403 and the number of candidates who were placed in higher education programs was 789,112, and by 2020, these numbers increased to 2,436,958 and 921,886 respectively. In the last 10 years, the number of candidates applying to higher education has increased by 42%, while the number of candidates placed after the university entrance exam has increased by only 17%.

The rate of candidates who are placed in a program in 2020 is 18.5% at the undergraduate level, 11.7% at the associate degree level, and 1.7% at the open education (i.e., off-campus) level. Accordingly, 31.9% of new high school graduates could be placed in a higher education program. This data shows that more than two-thirds of recent high school graduates were unable to enter a program in the first year of the university entrance exam. This situation shows that the imbalance between supply and demand arising from the higher education entrance examination will continue in the coming years.

Although the quotas of associate and undergraduate programs were reduced compared to the previous years, we can see that the quotas were still not filled. Issues such as threshold application based on success ranking for some programs, low demand for some programs and universities, and lack of guidance can lead to vacancy with the higher education quotas.

Chapter B: Access and Participation in Higher Education

The total number of newly enrollment students, which was 1 million 407 thousand in 2015, decreased to 1 million 367 thousand in 2019. Since open education has an important share in new enrollments, it is necessary to evaluate the number of face-to-face (i.e., on-campus) and open education enrollments separately in order to fully see the trends over the years. While the total number of new face-to-face registrations was 827 thousand in 2015, this number increased to 831 thousand in 2019, showing different trends over the years. In other words, the number of new registrations increased by only 4 thousand in five years. As has been pointed out in

our previous reports for several years; the higher education system experienced an expansion between 2006-2014 followed by a serious slowdown and halt after 2015.

Net schooling rates for both men and women increased between 2014 and 2017. However, between 2017 and 2018, this rate decreased from 45.6% to 44.1%. In other words, there was a 1.5 point decrease per year.

The total number of students, which was 3 million 477 thousand 940 in 2009, increased to 6 million 62 thousand 886 in 2014 and to 7 million 940 thousand 133 in 2019. These numbers include open education students. During the 10-year period, the number of undergraduate and graduate students nearly doubled, while the number of associate degree students nearly tripled.

The share of open education in Turkey's higher education system continues to increase. Considering the change in the rate of open education students in the total number of associate and undergraduate students between 2015 and 2019, the share of open education in undergraduate degrees remained almost constant, while the share of open education students in associate degrees increased from 54% to 67%. In 2019, 3 million 436 thousand out of 4 million 117 thousand open education students studied at Anadolu University.

Parallel to the decrease in the total number of face-to-face students in recent years, there has been a decrease in the 18-22 age net higher education enrollment rate for the first time. Between 2017 and 2018, this rate decreased from 45.6% to 44.1%. There was a sharp drop of 1.5 points per year. Considering that there are 1 million 200 thousand people in each age group, a decrease of 1.5 points means that 90 thousand young people in the 18-22 age range did not have access to higher education. Turkey's current lack of increase in higher education enrollment rates for young people means that Turkey will continue to lag behind other OECD countries in the 25-34 and 35-64 age range with regards to the proportion of higher education graduates in subsequent years.

Chapter C: Education Outputs

While the rate of higher education graduates in the 25+ age group was 13% for women, 17.7% for men and 15.3% in total in 2015, it increased to 15.8% for women, 19.6% for men and 17.7% in total in 2019.

When the rate of higher education graduates in the 25-34 age group is examined, we can see that it was 26.7% for women, 27.3% for men and 26% in total in 2015. The same rate was 29.5% for both men and women in 2017. In 2018 and 2019, the rate of higher education graduates of women exceeded that of men. In 2019, the proportion of women in the 25-34 age group who graduated from higher education was 32.9%, while the rate of men was 31.1%. Considering the current indicators, the proportion of women with higher education degrees in the population of 30-34 and 35-39 age groups will likely exceed that of men in the coming years.

Amongst OECD countries, Turkey is one of the countries that has had the greatest decrease in the proportion of 20-24 year-olds that are neither enrolled in school nor work. Nevertheless,

according to data from the OECD countries in 2019, the percentage of those aged 20-24 who do not attend school or work is highest in Turkey with a rate of 33,3%. The fact that this ratio is high points to an inability in using the manpower that will provide added value to the national economy, an inefficiency of education and human resources planning, and therefore an insufficiency of employment opportunities and high unemployment rates.

At the associate degree level 127 thousand students graduated in 2009, 288 thousand in 2014 and 311 thousand in 2019. At the undergraduate level this rate was 220 thousand in 2009, 399 thousand in 2014 and 486 thousand in 2019. Compared to the previous year, the number of graduates at the associate degree level increased by approximately 5,500 and the number of graduates at the undergraduate level increased by 31,000.

While the number of graduates at the postgraduate level in 2015 was 44 thousand, this rate gained rapid acceleration between 2017-2019 and was 86 thousand in 2019. While the number of graduates at the doctoral level was 5 thousand in 2015, it reached 8 thousand in 2019.

Employment rates of higher education graduates continue to be higher than those with lower education levels. While unemployment rates of women with higher education are higher than that of men, their employment rates are also low.

For 2018, the OECD average for the relative earnings of general high school graduates compared to the earnings of employees with less than high school education (= 100) is 126, the OECD average of relative earnings of vocational high school graduates is 125, and the OECD average of the relative earnings of higher education graduates is 189. In Turkey, the general high school level of graduate employees is (126) for vocational high schools this number is (131) and graduates relative earnings of employees were similar to the OECD average. This rate for higher education graduates was (214), higher than the OECD average.

In terms of higher education graduate rates amongst OECD countries, Turkey is among the lowest. Only for the 25-34 age range is there a 10-point difference between average rates of higher education graduates for OECD countries when compared with Turkey's rate. Only within this age range and the OECD average, Turkey has about 1 million 200 thousand university graduates in the open.

Chapter D: Academic Staff

Between 2015 and 2019, the number of research assistants increased from 47 thousand to 51 thousand, the number of lecturers from 36 thousand to 38 thousand, and the number of lecturers (doctorate degree holding lecturers, associate professors and professors) from 73 thousand to 86 thousand.

The total number of lecturers in state universities increased from 60 thousand to 71 thousand, and the total number of lecturers from 132 thousand to 148 thousand. In foundation higher education institutions (i.e., private institutions), the total number of faculty members increased from 12 thousand to 15 thousand, and the total number of academic staff from 24 thousand to 27 thousand. We can see that there is a general growth trend in both state and foundation

higher education institutions. However, according to all academic titles, the growth between 2014-2019 is smaller than the growth between 2009-2014. This situation points out that the growth momentum in higher education decreased in terms of the number of faculty members.

As of 2019, the rate of female faculty members in state higher education institutions (38%) is lower than the rate of female faculty members in foundation higher education institutions (44%).

The average number of students per teaching staff for OECD countries is 15. However, this same ratio is 25 in Turkey. The additional instructors Turkey needs in order to be the OECD average is 83 thousand instructors. Assuming that 70% of this is academic staff, there is a shortage of 58 thousand faculty members. Likewise, assuming that the remaining 30% are lecturers, there is a shortage of 25 thousand lecturers. In sum, when considering the number of students who receive face-to-face education in Turkey, the existing 124 thousand faculty members would need to be increased to 206 thousand in to achieve the OECD average for the number of students per instructor. It is important to note that when only 2 million of the current open education students are accepted as active enrolled students and included in the calculation, the current 83 thousand person deficit will increase to the 185 thousand.

Chapter E: Educational Environments

As of 2020 Turkey has a total of 208 higher education institutions including 129 state universities and 79 foundation higher education institutions.

There is an uneven distribution of students and faculty in higher education institutions in Turkey, and thus a high number of students per faculty member. The number of students per faculty member in Turkey is considerably higher than the OECD average and this adversely affects the quality of education.

While the capacity of KYK dormitories was 450 thousand in total in 2015 and increased to 703 thousand as of the 2019-2020 academic year.

Chapter F: Financing of Higher Education

While the ratio of the higher education budget compared to the central government budget was 4.17% in 2016, it decreased to 3.3% in 2020. The share allocated from the central government budget to the higher education budget has steadily decreased in the last five years.

Turkey spends a ratio of (1.69%) of its GDP on higher education, a higher ratio than the OECD average of (1.42%).

With regards to higher education, we can see that the average expenditure per student in state higher education institutions displays a decreasing trend over time.

Chapter G: Academic and Innovation Performance of Universities

According to date from the Web of Science and Scopus, Turkey has experienced an increase in the number of publications between 2010-2016 but has experienced a decline in 2017. According to

Scopus, Turkey reached the 2016 level in 2019, and according to Web of Science, it reached the 2016 level in 2018. According to Scopus data, Turkey's share in international publications was 1.35% in 2010, increased to 1.60% in 2016 and went from 1.45-1.47% between 2017-2019. All of this data shows that Turkey experienced a slight decline in recent years in terms of international academic publication production , but that there is a trend towards an increase in this number. However, when viewed in terms of global share, we can see that Turkey's share has decreased. This means that other countries have increased their publication numbers at a higher rate than Turkey.

Turkey has increased its number of R&D personnel by 49% between 2014-2018. While the increase in Turkey's R&D personnel seems high, the number is still low when compared to international numbers.

Conclusions and Recommendations

- Considering that the demand for higher education will increase with each passing year, it becomes clear that higher education capacity should be increased.
- Decisions regarding the number of quotas for existing or newly opened programs in different fields of higher education should be made taking into account the needs of the labor market and employment opportunities.
- The rate of students who apply for the university entrance exam at the senior high school level and who are placed in a higher education program decreases every year. The reasons for this decrease should be examined in detail and current higher education quota policies should be reviewed.
- While Turkey is in an upward trend in the total number of students in higher education the fact that this upwards trend results from a growth in open education should not be overlooked. One on hand, the number of young people who have graduated from secondary school in Turkey continues to increase, while on the other, the total number of face-to-face higher education students has not increased. In order to produce better quality growth and respond to the increasing demand for higher education Turkey should increase the number and capacity of face-to-face programs. The share of open education in higher education should be reduced and an efficient system with high social prestige should be established.
- Decreasing the share of evening education in the system without decreasing the share of open education means reducing face-to-face education opportunities and not using resources effectively.
- Policies should be developed for a more balanced distribution of higher education institutions, especially foundations, throughout the country. Likewise, policies that will ensure a more balanced distribution of the total number of students among higher education institutions and thus increase the quality of education service should be implemented.

- Although there is significant upward trend in the number of doctoral graduates; when we take into account the number of PhD-holding faculty which Turkey needs, there is a need to further increase the number of doctoral graduates.

- Almost a quarter of those who graduated from higher education in recent years are open education graduates. The share of open education in the higher education system should be reduced.

- Effective policies should be developed to reduce youth unemployment and increase employment. Furthermore, policies should be implemented to address Turkey' youth population who are neither employed nor engaged in higher education. These policies should pay special attention to the difference in regions across Turkey with regards to this issue and aim to bridge the gap amongst regions.

- In order to tackle the insufficiency in number of faculty members that Turkey's higher education system faces, national and international programs which support postgraduate training should be expanded.

- There are extreme differences between state and foundation higher education institutions in terms of the number of students per academic staff and teaching staff. Priority should be given to meeting the personnel needs of higher education institutions that need academic staff.

- In order for Turkey to achieve the average amount that OECD countries spend per student in the higher education system, the annual spending per student should be increased from 35,41 billion TL to 59,55 billion TL (2019 prices).

- The budget allocated for higher education should be increased, taking into account the investment expenditure needs of both the universities which have divided amongst themselves, and the universities established after 2006 (third wave).

- The number of students receiving scholarships in higher education should be increased in order to ensure equal opportunities and increase rates of accessibility.

- Regarding the number of international publications and patents, Turkey is in a general upward trend. However, Turkey's global share in international publications is decreasing and finds itself behind even smaller countries in terms of publication numbers. To compete in the international arena with Turkey's existing doctorate researchers and academics numbers is not possible. In order to develop its R&D and increase its international publications and patents, Turkey must increase its number of researchers. For this, it is necessary to increase international publication incentives and the average number of international publications of academic staff. Working conditions must be improved in order to encourage international researchers and academics working in Turkey.

CHAPTER A

TRANSITION TO HIGHER EDUCATION

As in many countries in the world, the transition from secondary education to higher education is a major issue in Turkey that must be managed for the sake of the education system and is a critical milestone for secondary school graduates (Gur et al., 2017). An increasing number of students continue to enroll in higher education every year in the Organisation for Economic Cooperation and Development (OECD) countries. In most of these countries, central exams towards the end of upper secondary education and entrance exams administered by higher education institutions are the most commonly used exams for entry to higher education programs (OECD, 2019). Similar to these countries, Turkey also conducts yearly exams during the transition from secondary to higher education and continues to experience an increase in demand for higher education. Increasing demand causes an increase in competition among students who want to enroll in higher education institutions. This brings about the important issue of matching student preferences with existing higher education programs.

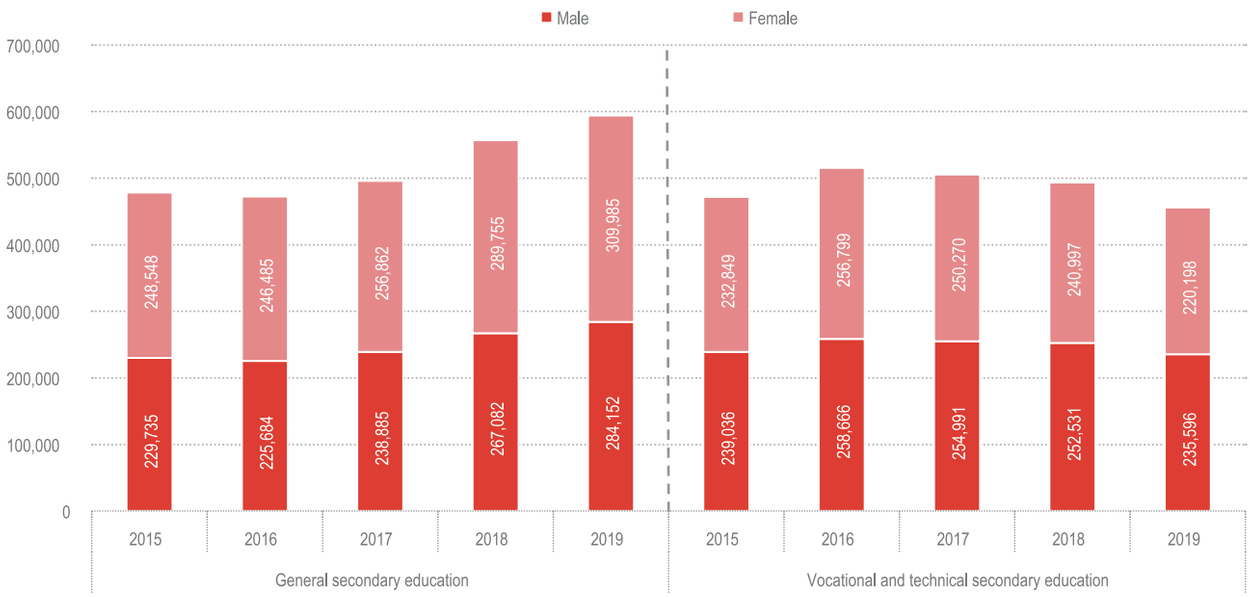
This section will examine the number of graduates in secondary education in Turkey and will compare this data with other OECD countries. Subsequently, the transition to higher rates of secondary education in Turkey will be discussed in detail, followed by an examination of the quotas in higher education.

INDICATOR A1

WHAT IS THE NUMBER OF SECONDARY EDUCATION STUDENT?

Under this indicator, the number of secondary education graduates, which constitutes the student source of higher education, is analyzed according to gender and school type. The share of female students among high school graduates and secondary education graduates in OECD countries is analyzed comparatively.

Figure A.1.1 Trends in the number of graduates from secondary education by gender and type of school (2015-2019)

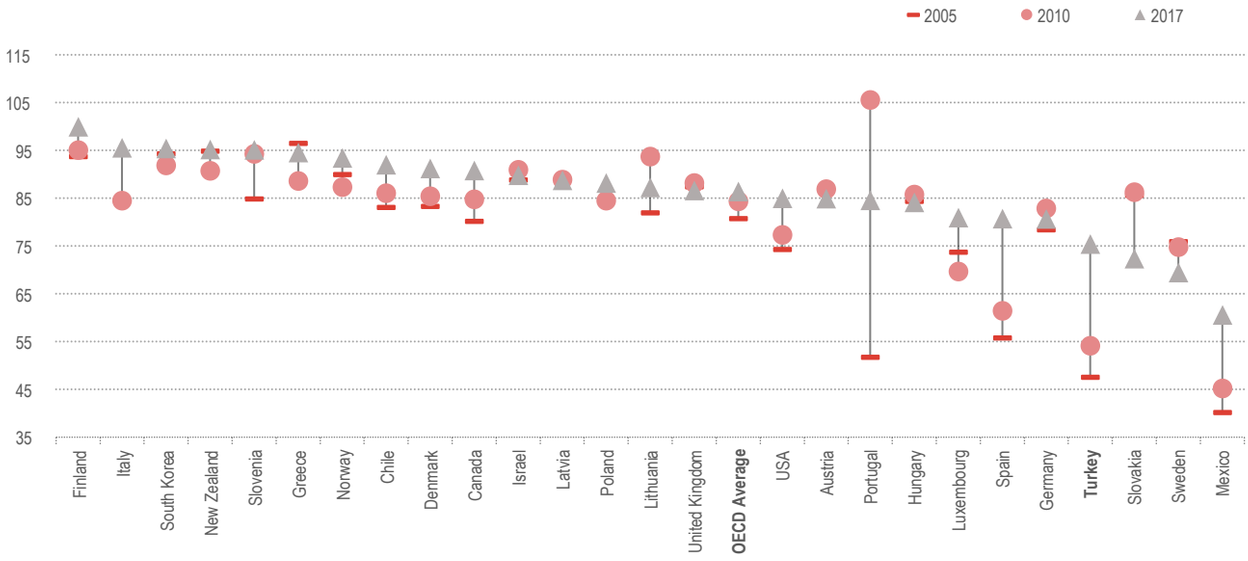


Source: Prepared using MEB statistics published from various years.
Note: Includes open education student numbers.

Figure A.1.1 shows the change in the number of students who graduated from secondary education between 2015-2019 by gender and school type. While the total number of graduates was 950,168 in 2015, by 2019 this number increased to 1,049,931. The main reason for this increase is that secondary education is compulsory in the new 4 + 4 + 4 level compulsory education system since the 2012-2013 academic year and the number of students in these institutions has increased every year for four years. However, the share of general secondary education, and vocational and technical secondary education among the total secondary education graduates has changed over the years.

In vocational and technical secondary education, while the number of female students and male students graduating increased in 2016 compared to 2015, this number decreased from 2017-2019. In 2019, 284,152 male students and 309,985 female students graduated from general secondary education, and 235,596 male students and 220,198 female students graduated from vocational and technical secondary education. In secondary education, a total of 1,049,931 students graduated, including 519,748 male students and 530,183 female students. In addition, while the rate of female students among those who graduated from general secondary education in 2019 is 52%, this rate is 48.3% in vocational and technical secondary education. In general, it can be easily said that the number of graduates from secondary education will be over 1 million every year from now on. The number of new enrollments in secondary education will continue to vary between 1 million 50 thousand and 1 million 100 thousand for the foreseeable future (MEB, 2019, 2020).

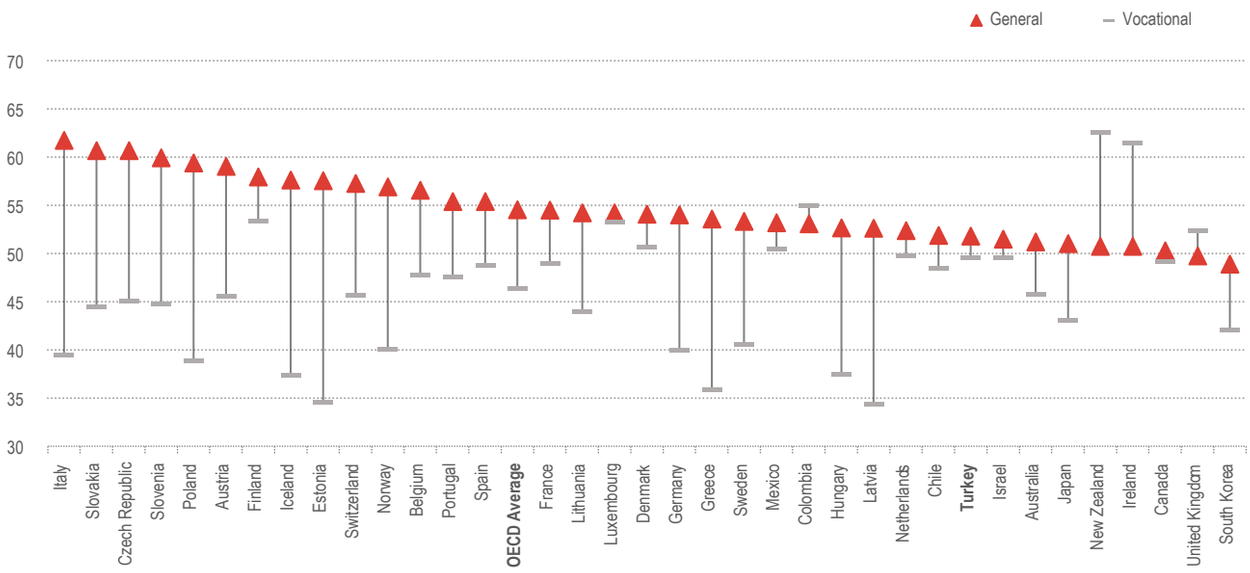
Figure A.1.2 Change in tertiary graduation rates for all age groups in OECD countries (%) (2005, 2010 and 2017)



Source: OECD (2019).

Figure A.1.2 shows the change in gross secondary education graduation rates in OECD countries in 2005, 2010 and 2017. The countries with the highest high school graduation rates in 2017 were Finland (100%), Italy (96%), South Korea, New Zealand, Slovenia and Greece (95%) The countries with the lowest high school graduation rates were Mexico (61%), Sweden (%) 69), Slovakia (72%) and Turkey (75%. In terms of high school graduation rate, the average of OECD countries waw 81% in 2005, 84% in 2010 and 86% in 2017. The three

Figure A.1.3 Share of female graduates among tertiary graduates by program type in OECD countries (%) (2017)



Source: OECD (2019).

countries whose high school graduation rate increased the most from 2010 to 2017, respectively, were Turkey (21% points), Spain (20% points) and Mexico (16% points). On the other hand, in Portugal, Slovakia, Lithuania, and Sweden, high school graduation rates decreased considerably in 2017 compared to 2010. As a result of compulsory education in Turkey being raised to 12 years in the year 2012, there was a rapid increase in the country's high school graduation rate. However, as pointed out above, considering that approximately three quarters of the relevant age group can graduate, we can see that the success achieved in enrollment in secondary education cannot be achieved at graduation from secondary education.

Figure A.1.3 shows the share of female students among those who graduated from secondary education by school type in OECD countries in 2017. In OECD countries, with the exception of South Korea, the United Kingdom and Canada, the share of female students is significantly higher among those graduating from general programs in secondary education than vocational programs. As the average of OECD countries, while female students constitute 55% of graduates in general programs in secondary education, this rate is 46% in vocational programs. The country with the lowest share of female students among those graduating from general programs in secondary education is South Korea (49%), while the countries with the highest are Italy (62%), the Czech Republic and Slovakia (61%). There are significant differences between countries when it comes to vocational programs. The countries with the highest share of female students among those graduating from vocational programs in secondary education are New Zealand (63%) and Ireland (61%). Those with the lowest rates are Latvia (34%), Estonia (35%), Greece (36%), Hungary and Iceland (37%). In addition, the share of female students among those who graduated from both general and vocational programs is higher than 50% in Finland, Luxembourg ,and Colombia.

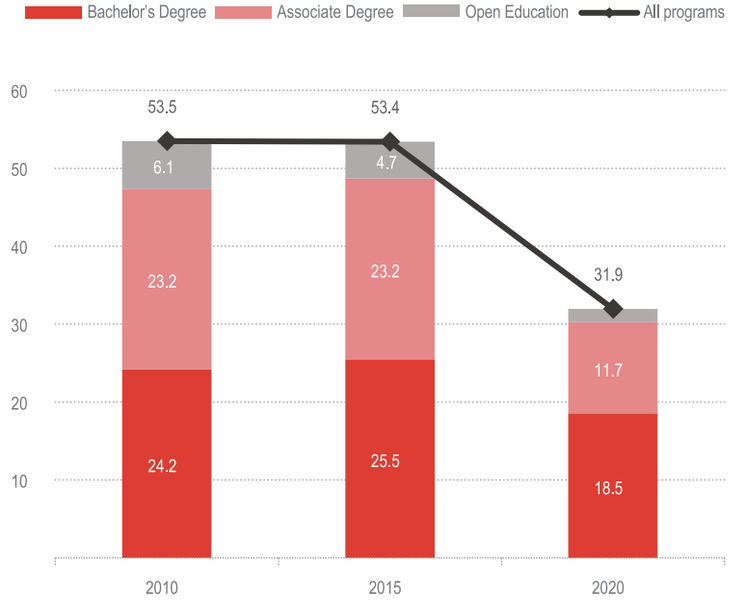
In general, the number of secondary education graduates in Turkey is increasing every year and has currently exceeded 1 million. This increase is a result of the compulsory education polices that were implemented. In contrast, in 2017 Turkey had a high school graduation rate of (75%), ranking among the lowest amongst OECD countries. This means that one out of every four people cannot finish high school and therefore enroll in open education high school as it is compulsory. Although eight years have passed since the period of compulsory education was increased from 8 to 12 years, there is a need for a comprehensive study on how much of the relevant age population has graduated from secondary education. In addition, the share of female students among those who graduated from both general and vocational secondary education programs is quite high. Female students in Turkey have achieved equal opportunities in education and have moved from being in a disadvantageous position to being in an advantageous one. This situation, which is in favor of female students, shows itself at the higher education level, as will be mentioned further in the report.

INDICATOR A2

WHAT IS THE RATIOS OF TRANSITION TO HIGHER EDUCATION?

This indicator examines the ratio of students who undertook the college entrance exam in their last year of secondary education and were placed into higher education programs. In addition, placement rates according to secondary school type have been assessed.

Figure A.2.1 Change in the ratio of students who took the university entrance exam in the last year of secondary education and were placed into higher education programs (%) (2010, 2015 and 2020)



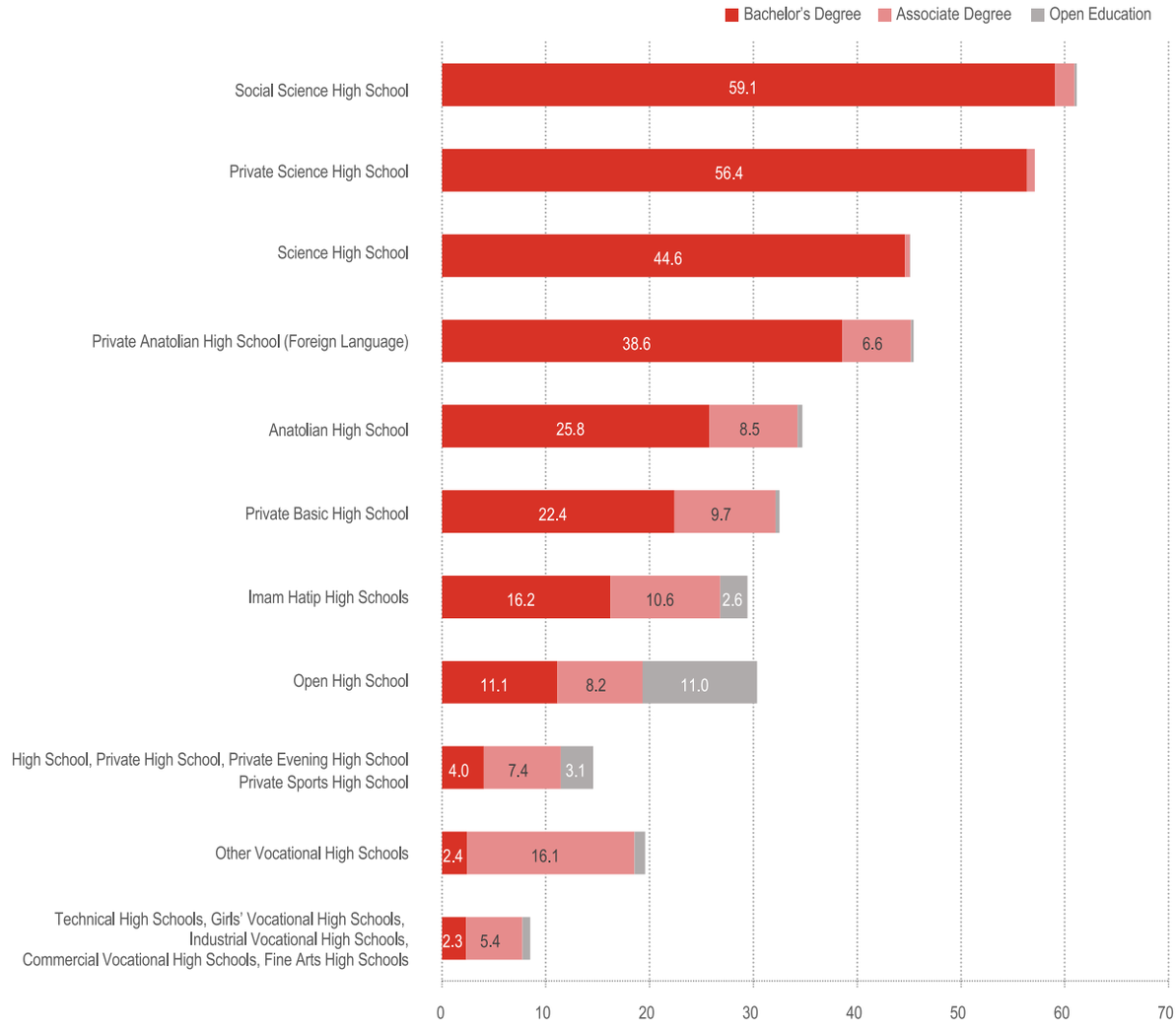
Source: Prepared using MEB statistics published from various years.

Figure A.2.1 shows the change in the rate of students who applied to the university entrance exam in the last year of secondary education in 2010, 2015 and 2020 and who were then placed into higher education programs. While 53.5% of the candidates who undertook the entrance examination to higher education in the last year of high school were placed in a program in 2010, the rate of those who undertook the higher education entrance examination in the last year of high school remained almost the same in 2015 and was 53.4%. However, this rate decreased very sharply to 31.9% in 2020. There is a significant decline in the rate of candidates placed at both associate degree and undergraduate level over the years. The rate of candidates who were placed in a program in 2020 is 18.5% at the undergraduate level, 11.7% at the associate degree level, and 1.7% at the open education level. This data shows that more than two-thirds of new high school graduates cannot be placed in a program in the first year of the university entrance exam. This means that the supply and demand mismatch due to the higher education entrance examination will continue in the coming years. The main reason for this situation is that although the demand for higher education has increased over the years, there has not been a significant increase in higher education supply. (see Figure A.3.1).

The rate of students who were placed in higher education programs among the candidates who undertook the university entrance exam at the senior high school level according to the type of high school in 2019 is given in Figure A.2.2. According to this, among the candidates who took the university entrance exam at the senior high school level, those who were enrolled in higher

education programs at a higher are from social sciences high schools, private science high schools, and science high schools. Among those who applied for the university entrance exam at the senior high school level, 59.1% of those who were in the last year of social sciences high schools, 56.4% of those who were in the last year of private science high schools, 44.6% of those who were in their last year of science high schools, 38.6% of those in their last year of private Anatolian high schools (foreign language), 25.8% of those in the last year of Anatolian high schools, 22.4% of those in the last year of private basic high schools, and 16.2% of those who are at the senior level of Imam Hatip high schools enrolled in higher education programs at the undergraduate level. When we compare the ratio of candidates who took the university entrance exam according to the type of high school in the last year of high school to the rate of those who were placed in higher education programs in 2017, we see that in almost all types of high schools, there is a decrease observed in terms of placement rates (Çelik et al., 2017). When we examine these numbers, we can see that graduates of vocational and technical education high schools are placed in associate degrees and open education programs rather than in undergraduate programs.

Figure A.2.2 Rate of candidates who took the university entrance examination at the senior high school level by type of high school (%) (2019)



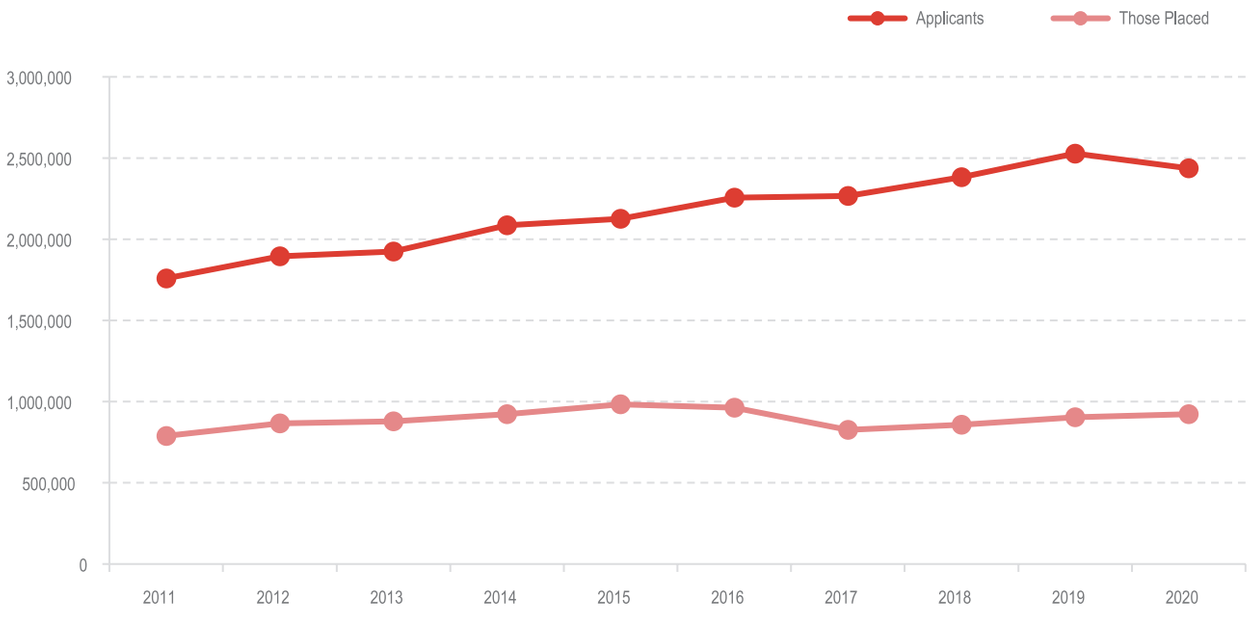
Source: Prepared using numerical information regarding the placement results of the 2019 Higher Education Institutions Exam (YKS) published by ÖSYM.

INDICATOR A3

WHAT IS THE NUMBER OF HIGHER EDUCATION QUOTAS?

This indicator will examine the change in the number of candidates who applied to the Student Selection and Placement System (ÖSYS) and were placed in higher education programs. In addition, the changes in the quotas of associate and undergraduate programs and the number of vacant quotas in higher education will be discussed.

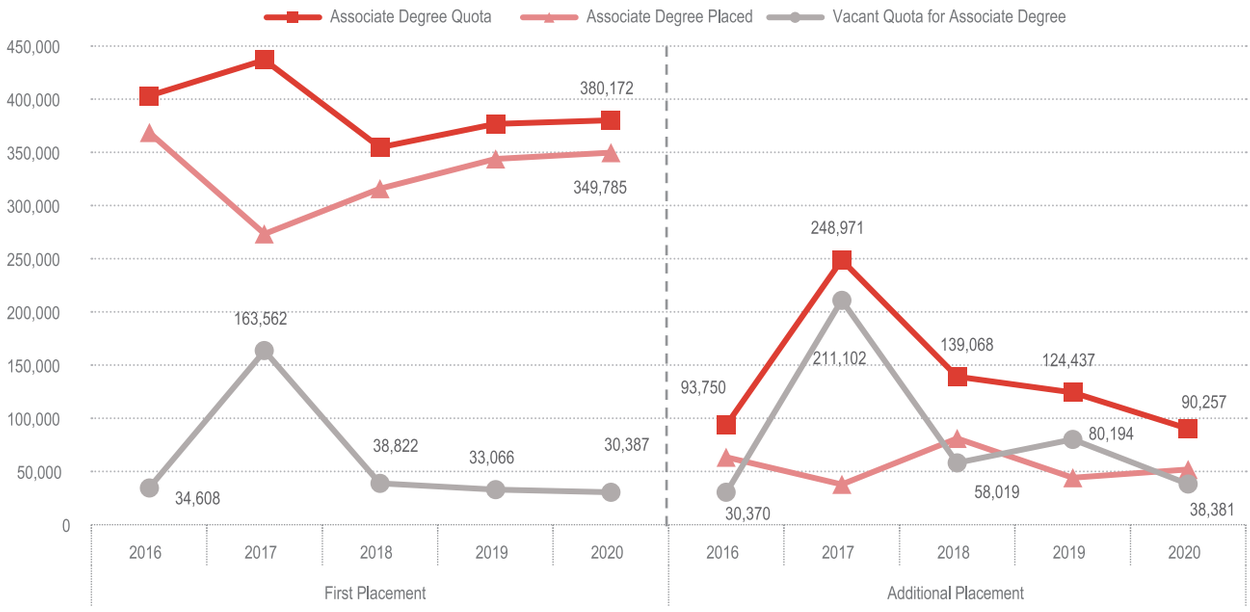
Figure A.3.1 Trends in the number of candidates applying to and placed by higher education (2011-2020)



Source: Prepared using MEB statistics published from various years.

Figure A.3.1 shows the change in the number of candidates who applied to higher education and were placed into programs between 2011 and 2020. The number of candidates applying for the university entrance exam has shown a continuous increase. While the number of candidates applyingto higher education in 2011 was 1.759.403 and the number of candidates who were placed in higher education programs was 789.112. The number of candidates who applied for the university entrance exam was 2.436.958 in 2020 and the number of those placed in programs increased to 921,886. The number of candidates applying to higher education has continuously increased until 2019, and in 2020 it decreased by 91,000 compared to the previous year. The number of candidates who were placed in higher education programs as a result of the university entrance exam has increased between 2011 and 2015. As a result of these decreases and increases, only in 2020 was Turkey able to reach the number of candidates who were placed in 2014 once again. In other words, since 2011, the gap between the number of candidates who have taken the university entrance exam and have been placed has yet to be closed. In the last 10 years, the number of candidates applying to higher education has increased by 42%, while the number of candidates who have been placed as a result of the university entrance exam has increased by only 17%.This situation is related to the limited number of universities and available quotas. From 2015 to 2020, there has been no increase in the number of candidates placed into higher education programs. Rather, while 983 thousand people were placed in 2015, this number decreased to 922 thousand in 2020. When we make a general evaluation, we can see that the gap between the number of applicantsto higher education will increase every year. It appears evident that the problems between supply and demand will continue to exist.

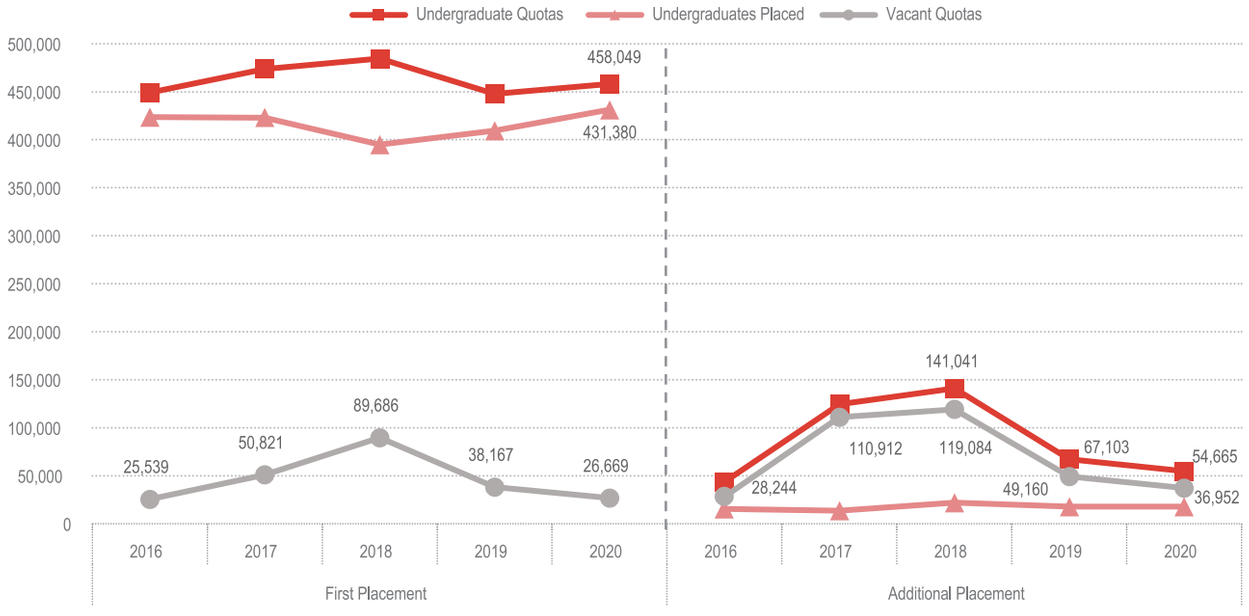
Figure A.3.2 Trends in the quotas of associate degree programs in higher education and the number of filled and vacant quotas (2016-2020)



Source: Prepared using numerical information about ÖSYM placement and additional placement results published in various years.

Figure A.3.2 shows the change in the quotas of associate degree programs in higher education between the years of 2016-2020, and the number of quotas filled and those that were vacant. After the initial placement in higher education, an additional placement opportunity is given to the vacant quotas (or, exceptionally, some newly opened programs). Candidates were placed in 368,770 of the 403,378 quotas allocated to associate degree

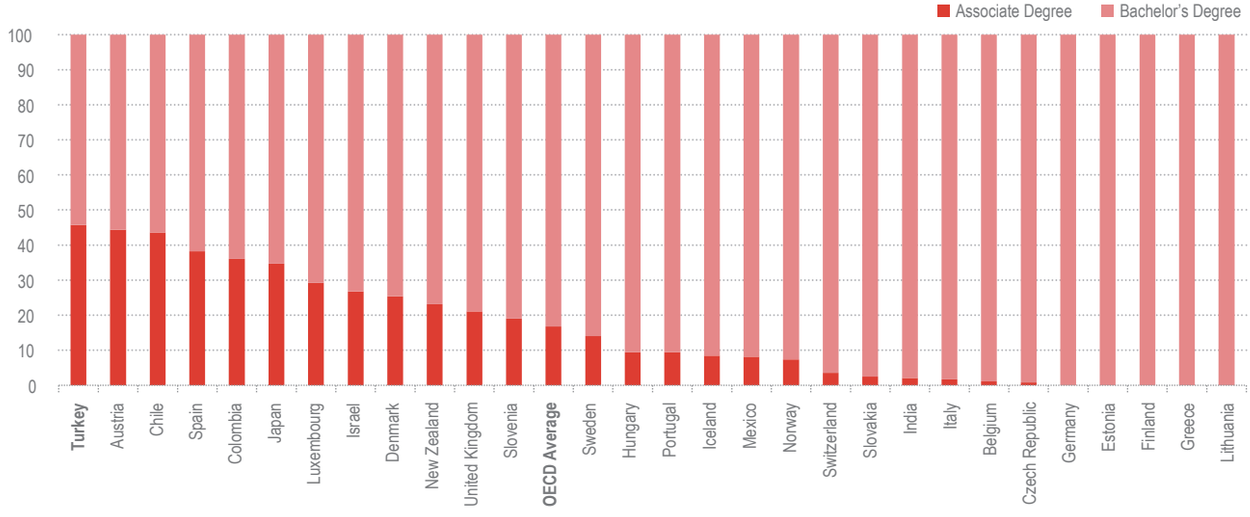
Figure A.3.3 Trends in the quotas of undergraduate programs in higher education and the number of vacancies and filled quotas (2016-2020)



Source: Prepared using numerical information about ÖSYM placement and additional placement results published in various years.

programs in the first placement in 2016, and 34,608 quotas remained empty. In 2016, during the additional placement process, the number of quotas reached 93,750 and 63,380 of these quotas were filled and 30,370 of them remained empty. In 2017, in the first placement, the quota of associate degree programs increased to 436,904 and the number of people who were placed in an associate degree program decreased significantly to 273,342 and 163,562 quotas remained empty. During the additional placement process, 211,102 of the 248,971 quotas remained empty. In other words, approximately half of the total associate degree quota remained empty even after the additional placement process. As a result of this situation, the number of associate degree quotas has been reduced in the following years. In 2020, the number of associate degree quotas was determined as 380,172 and as a result of the first placement, 30,387 quotas remained empty. During the additional placement process, 38,381 of 90,257 quotas remained vacant. In other words, as a result of the first placement and additional placement in 2020, approximately 10% of the total associate degree quotas still remained empty.

Figure A.3.4 Graduation rate and profile of first-time tertiary education graduates in OECD countries (%) (2018)



Source: OECD (2020).

The change in the quotas of undergraduate programs in higher education between 2016 and 2020 is given in Figure A.3.3. The quota allocated to undergraduate programs in the first placement was firstly increased from 449.018 to 484.631 between 2016-2020, and then decreased to 458.049. The number of vacant quotas increased from 25,539 in 2016 to 26,669 in 2020. In 2020, during the additional placement process, the number of undergraduate quotas was 54,665 and 36,952 quotas remained vacant as a result of the additional placement. In other words, as a result of the first and additional placement in 2020, approximately 8% of the total undergraduate quotas remained vacant.

In Figure A.3.4, the distribution students who entered higher education for the first time in OECD countries in 2018 according to their education level has been given. As can be seen in the figure, undergraduate programs (including graduate and master equivalent degree programs such as dentistry, medicine and engineering) are the most common access route to higher education in OECD countries. 17% of those who entered higher education for the first time in terms of the average of OECD countries were enrolled in an associate degree and 83% in the undergraduate level. During the additional placement process, 38,381 of 90,257 quotas were vacant. In other words, as a result of the first placement and additional placement in 2020, approximately 10% of the total associate degree quotas remained empty. The change in the quotas of undergraduate programs

in higher education between 2016 and 2020 is given in Figure A.3.3. The number of students enrolled during the initial for associate degrees is 449,018 and the rate of placed in undergraduate programs in the initial placement from 2016 to 2020 in Turkey is (46%). Amongst OECD countries, Austria and Chile (56%) and Spain (62%) have the lowest rate of students enrolling in higher education for the first time alongside Turkey (54%).

In Turkey, every year over 1 million people continue to graduate from secondary education. The number of people applying for higher education entrance exams has continuously increased until 2019 and has reached 2 million 528 thousand. In 2020, the number of applicants for higher education entrance examination decreased by 91 thousand people and reached 2 million 437 thousand. However, this year, the total number of those placed in programs including open education was 983 thousand. Only 17.7%, that is 431 thousand, of the candidates who applied for higher education entrance exams were placed in an undergraduate program. Moreover, comparisons made with OECD countries show that in Turkey the rate of those starting higher education for the first time is higher in pre undergraduate programs than undergraduate ones (see. Figure A.3.4.). 14.4% of those who applied for higher education, that is 350 thousand applied for associate degrees ; 5.7%, in other words 141 thousand were placed in open education programs, and 37.8% of the applicants in total were able to be placed in a higher education program. For comparison, 541 thousand, or 76.6%, of the 706 thousand candidates who applied to higher education in the United Kingdom in 2019 were placed in a higher education program (UCAS, 2020). More importantly, fewer than one-third of applicants in the last year in Turkey were placed settled into a higher education program. In other words, two-thirds of the applicants at the senior level could not be placed in a higher education program. As a comparison, in a system such as that in the United States that massively encompasses higher education in the early stages, 65-70% of high school graduates start higher education the year they graduate from high school according to the data of 2009-2018 (National Center for Education Statistics, 2020). In Turkey, the failure to place two-thirds of new graduates from high school into higher education shows that the number of applicants to the higher education entrance examination will increase in the coming years. This is because a significant portion of those who cannot be placed prefer to prepare for the exam again and perhaps even take the exam for a few years in a row. This data shows that the mismatch in supply (quotas) and demand (applicants) in the existing entrance to higher education can be considered the most chronic problem of the education system (Çelik et al., 2017; Çetinsaya, 2014; Gur, 2016; World Bank, 2007; YÖK, 2007) and that this issue will only worsen in the coning years. Another issue problem is the efficiently of how the available quotas are filled. According to the results of 2019 higher education primary and additional placement, 12% of associate degree programs and 11% of undergraduate programs remained vacant. Although the quotas of associate and undergraduate programs were reduced compared to the previous years, it is seen that the quotas were still not filled. Issues such as threshold application based on success ranking for some programs, insufficient demand for some programs and universities, and lack of guidance cause vacant quota problems (Çelik et al., 2017; Gür et al., 2018). Overall, this issue means that thousands of higher education spots remain empty and unavailable due to vacant quotas or departments that are not preferred.

CHAPTER A CONCLUSIONS AND RECOMMENDATIONS

- Considering that the number of graduates from secondary education exceeds 1 million and this will continue in the coming years and that the number of candidates applying for the ÖSYS has reached 2.4 million, we can conclude that the demand for higher education will increase every year. In response to this increase, higher education quotas should be increased and the society's demands for higher education should be met.

- Decisions regarding the number of quotas for existing or newly opened programs in different fields of higher education should be made taking into account the needs of the labor market and employment opportunities. The higher education system should be designed in consideration of the country's development goals and social needs. In this context, priority areas, especially engineering and basic sciences, should be encouraged in terms of the development of the country and its international competitiveness.

- Vacant or less preferred higher education quotas should be analyzed regionally or at the university level and the reasons for vacant spots should be investigated. Decisions should be taken to use resources more efficiently. We must ensure that universities behave proactively and express themselves within society. Universities should actively contribute to the processes of creating the preferences of high school students and graduates.

- The proportion of students undertaking the university entrance exam at the senior high school level and entering a higher education program is decreasing every year. Because the knowledge of these students is fresher and newer than other candidates, their success rates are expected to be higher. The reasons for this decline should be examined in detail and current higher education quota policies should be reviewed. Parallel with the capacity increase in higher education, measures should be taken to increase the employment rates of vocational and technical education graduates in general in secondary education. The connection of vocational education with the labor market should be strengthened. Steps should be taken to eliminate the mismatch between the skills that employers seek and the skills that graduate have (Özer, 2020).

- The rate of new enrollees in higher education at the associate degree level amongst OECD countries is the highest in Turkey. In other words, the rate at which the higher quota separates between higher education and associate degrees is much lower in Turkey than in OECD countries. In higher education quotas should be expanded especially at the undergraduate level.

CHAPTER A

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CHAPTER B

ACCESS TO AND PARTICIPATION IN HIGHER EDUCATION

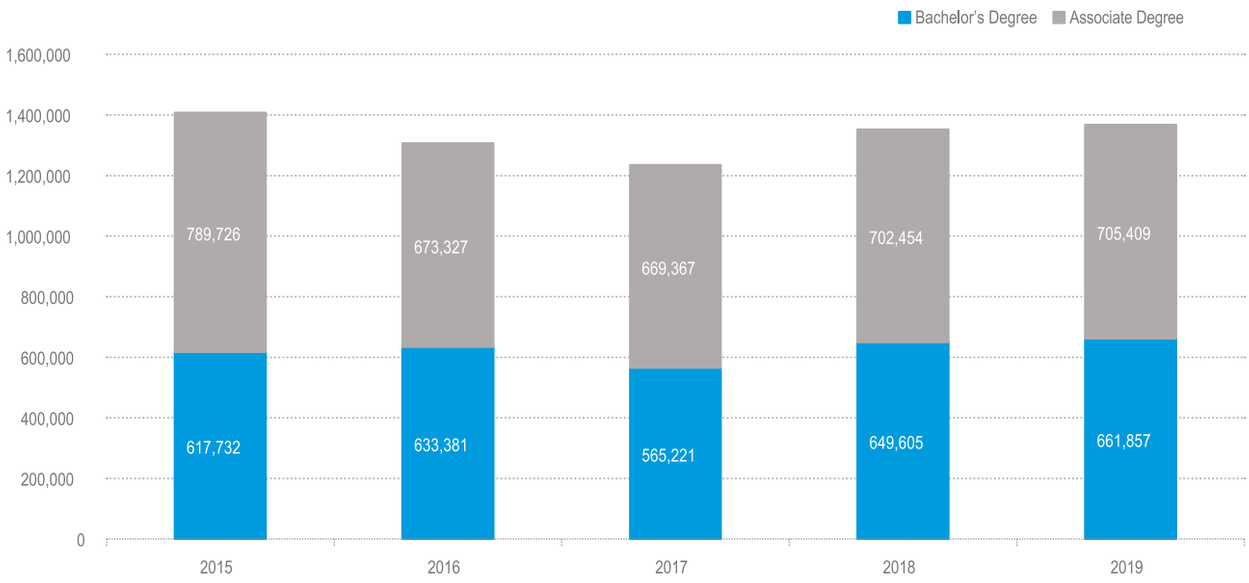
In this section, changes in the number of students will be examined in detail. In this context, the number of students enrolled in and studying at institutions of higher education will be analyzed by gender, type of higher education institution (state, foundation and foundation Vocational School), education levels (associate degree, undergraduate, graduate) and types of education (face-to-face education, evening education, open and distance education). In addition, schooling rates, the number of horizontal and vertical transfers, the number of disabled and international students will be examined.

INDICATOR B1

WHAT IS THE NUMBER OF NEW STUDENT REGISTRATIONS?

Under this indicator, firstly, the number of newly enrolled students in higher education is analyzed by education level. Then, new enrollments inn face-to-face programs and evening education is discussed according to education level.

Figure B.1.1 Trends in the number of newly enrolled students by education level (2015-2019)

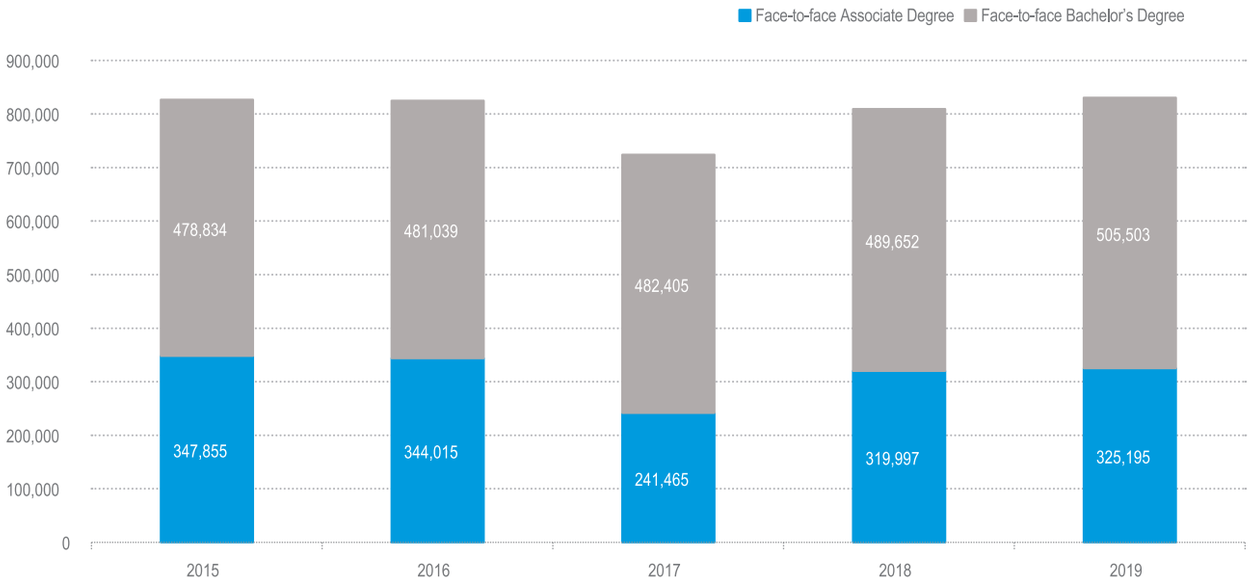


Source: Prepared using Higher Education Information Management System data.
Note: Includes open education student numbers.

The change in the number of newly enrolled students between the years of 2015-2019 according to their education level (including open education) is given in Figure B.1.1. The total number of newly enrolled students, which was 1 million 407 thousand 458 in 2015, decreased to 1 million 367 thousand 266 in 2019. In the same period, the number of newly enrolled students increased, while the number of newly enrolled students at the undergraduate level decreased. Since open education has an important share in new enrollments (see Figure B.4.1), it is necessary to evaluate the number of new face-to-face and open education enrollments separately in order to fully see the trends over the years.

The change in the number of students enrolled in face-to-face programs between 2015 and 2019 according to their education level is given in Figure B.1.2. Accordingly, the total number of face-to-face new registrations increased from 827 thousand in 2015 to 831 thousand in 2019, showing different trends over the years. In other words, the number of new registrations increased by only 4 thousand in five years. As we have pointed out in our reports for several years, the higher education system slowed down and paused after 2015 after experiencing an expansion between 2006-2014. New enrollment numbers in face-to-face education also confirm this pause.

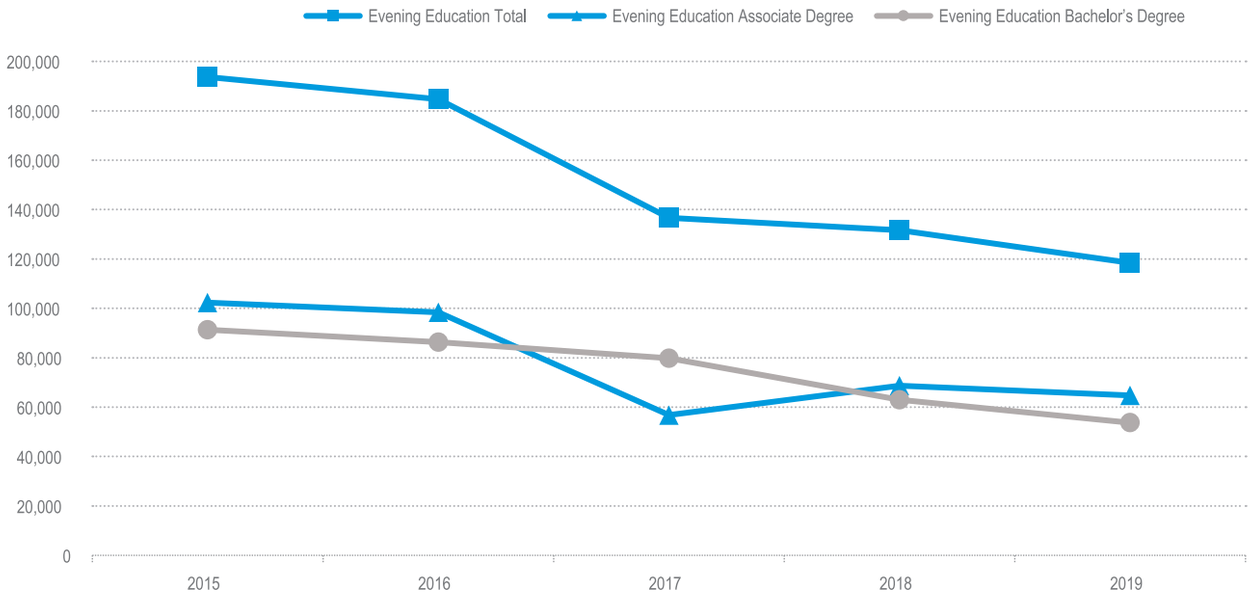
Figure B.1.2 Trends in the number of students enrolled in face-to-face programs by education level (2015-2019)



Source: Prepared using Higher Education Information Management System data.

Figure B.1.3 shows the change in the number of students enrolled in evening education programs between 2015 and 2019, according to their education levels. As seen in the figure, there is a sharp decrease in the number of newly enrolled students in evening education. The total number of new enrollments in evening education associate degree programs fell from 102 thousand to 65 thousand. The total number of new enrollments in

Figure B.1.3 Trends in the number of students enrolled in evening secondary education by education level (2015-2019)



Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

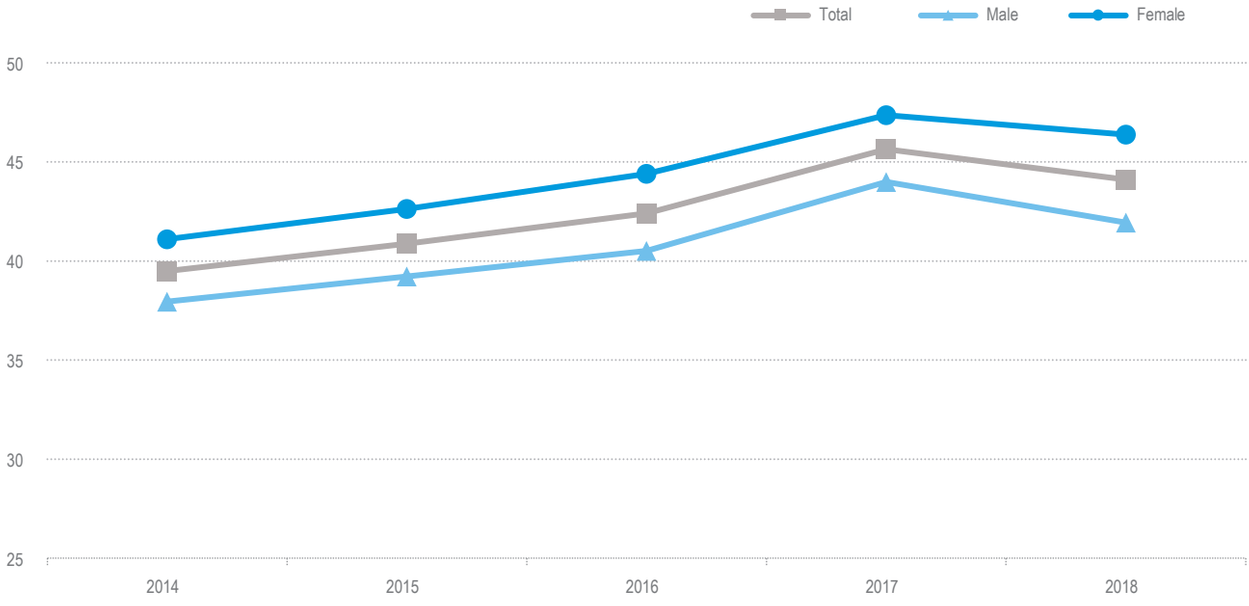
evening education undergraduate programs decreased from 91 thousand to 54 thousand. Evening education is one of the quickest ways to increase higher education capacity by using the infrastructure of existing higher education programs. The share of the number of students in evening education programs, which started in 1992, in the total number of students per hundred has increased from 2.7% to 23% in 2014 (Çetinsaya, 2014). While it is seen as positive in terms of increasing access to evening education, it is criticized for increasing the course load of teaching staff (Çetinsaya, 2014). Looking at higher education in 2020 in Turkey as a whole, we can see that the open education system continues to grow (see. Indicators B.4). Evening education's share of the drop to 14% from 23% in five years means the existing infrastructure cannot be considered sufficient.

INDICATOR B2

WHAT IS HIGHER EDUCATION NET SCHOOLING RATE?

This indicator will examine the change in higher education net enrollment ratios. The higher education net enrollment ratio is obtained by dividing the number of students in higher education in the 18-22 age group by the age population of the same age group and multiplying by 100 (MEB, 2019). The change of this rate over the years and the change in net enrollment ratios in higher education according to gender between 2014 and 2018 is shown in Figure B.2.1. Net enrollment ratios for both men and women between 2014 and 2017 are very important in terms of showing the change in the level of higher education utilization of young people in the

Figure B.2.1 Trends in net enrollment ratios (%) in higher education by gender (2014-2018)



Source: Prepared using statistics from the Ministry of National Education published in various years and the Outlook on Higher Education in Turkey 2019 Report.

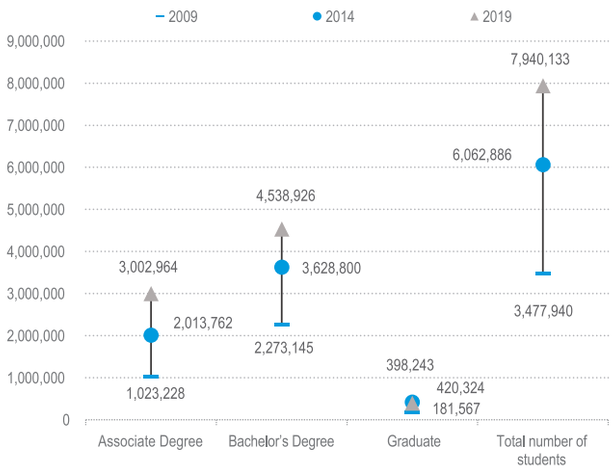
age group (18-22 years) (Gür et al., 2017). Theoretically, the maximum value of net enrollment ratio is 100% and shows that all young people in the relevant age population benefit from higher education. However, between 2017 and 2018, this rate decreased from 45.6% to 44.1%. In other words, there was a 1.5 point decrease in a year.

INDICATOR B3

WHAT IS THE NUMBER OF HIGHER EDUCATION STUDENTS?

This indicator discusses the higher education institutions in Turkey in terms of the number of students enrolled in higher education. First, the change in the total number of students according to education level and higher education institution for the years 2009, 2014 and 2019 is shown in Figure B.3.1. The total number of students, which was 3 million 477 thousand 940 in 2009, increased to 6 million 62 thousand 886 in 2014 and to 7 million 940 thousand 133 in 2019. During this 10-year period, the number of undergraduate and graduate students nearly doubled, while the number of associate degree students nearly tripled. In order to understand the source of this increase in the number of students, it is necessary to look at the higher education institution and education style (open education / face-to-face) (Figure B.3.2). The number of students was examined according to their type and type of education.

Figure B.3.1 Change in total number of students by education level (2009, 2014 and 2019)



Source: Prepared using the Higher Education Information Management System and ÖSYM data.

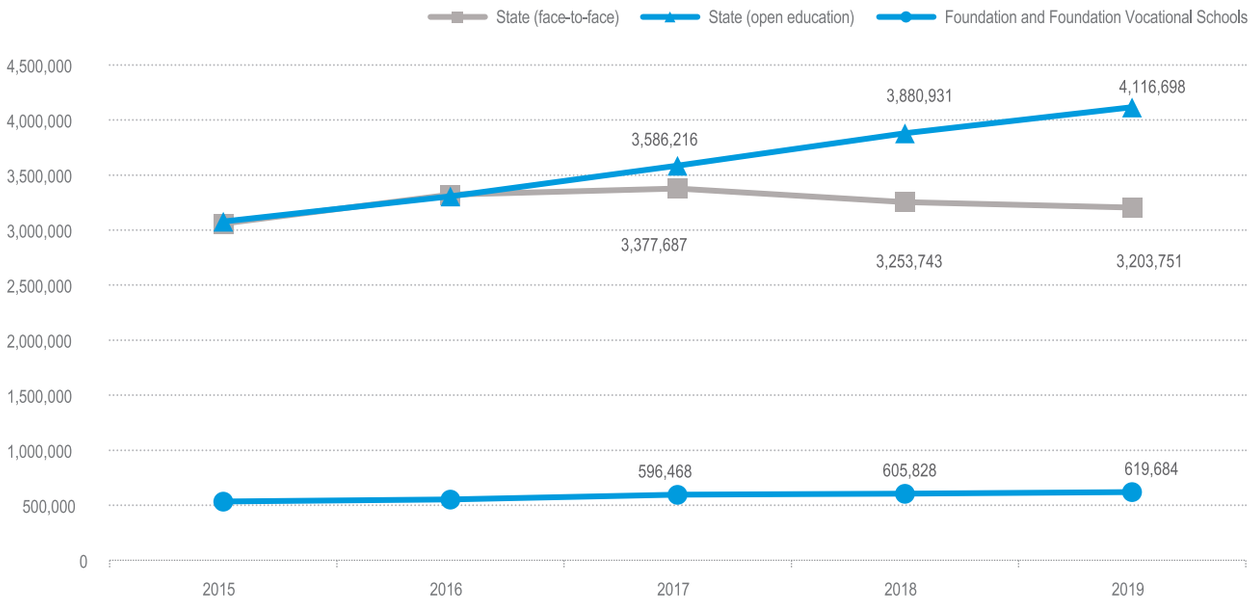
Note: Includes open education student numbers.

Figure B.3.1 shows the change in the total number of students for the years 2009, 2014 and 2019 according to education level. The total number of students, which was 3 million 477 thousand 940 in 2009, increased to 6 million 62 thousand 886 in 2014 and to 7 million 940 thousand 133 in 2019. During this 10-year period, the number of undergraduate and graduate students nearly doubled, while the number of associate degree students nearly tripled. In order to understand the source of this increase in the number of students, it is necessary to look at the higher education institution and education style (open education / face-to-face) (Figure B.3.2).

Figure B.3.2 shows the change in the total number of students between 2015-2019 according to the type of higher education institution and education type. Between the years of 2015-2019 foundation higher education institutions consistently increased their total student numbers. In state higher education institutions, we can see that the total number of students decreased after 2017. In 2017-2019, there was a 174 thousand decrease in the total number of students in state higher education institutions. The total number of students in open education increased by 530 thousand between the same years.

Considering the change in the share of students in state higher education institutions according to education level and type of education for the years 2009, 2014 and 2019 given in Table B.3.3, we can see that most of the students at the both associate degree and undergraduate level are still open education students as of 2019. While the share of open education students at undergraduate level was partially decreased, the share of open education students at associate degree level increased from 43% to 71% in just two years. Generally speaking, the share of open education students in Turkey's higher education system continues to increase (see. Figure B.4.2).

Figure B.3.2 Trends in the total number of students according to the type of higher education institutions and education type (2015-2019)



Source: Prepared using data from the Higher Education Information Management System and Outlook on Higher Education in Turkey 2019 Report.

Figure B.3.4 shows the total number of higher education students by province as of 2019. Accordingly, the leading provinces hosting the highest number of students are metropolitan cities such as Istanbul, Ankara, Izmir, Konya, Kocaeli and Bursa, respectively. There are multiple higher education institutions in most of the aforementioned provinces. On the other hand, small cities such as Hakkâri, Şırnak, Ardahan and Tunceli draw attention as the provinces with the least number of higher education students.

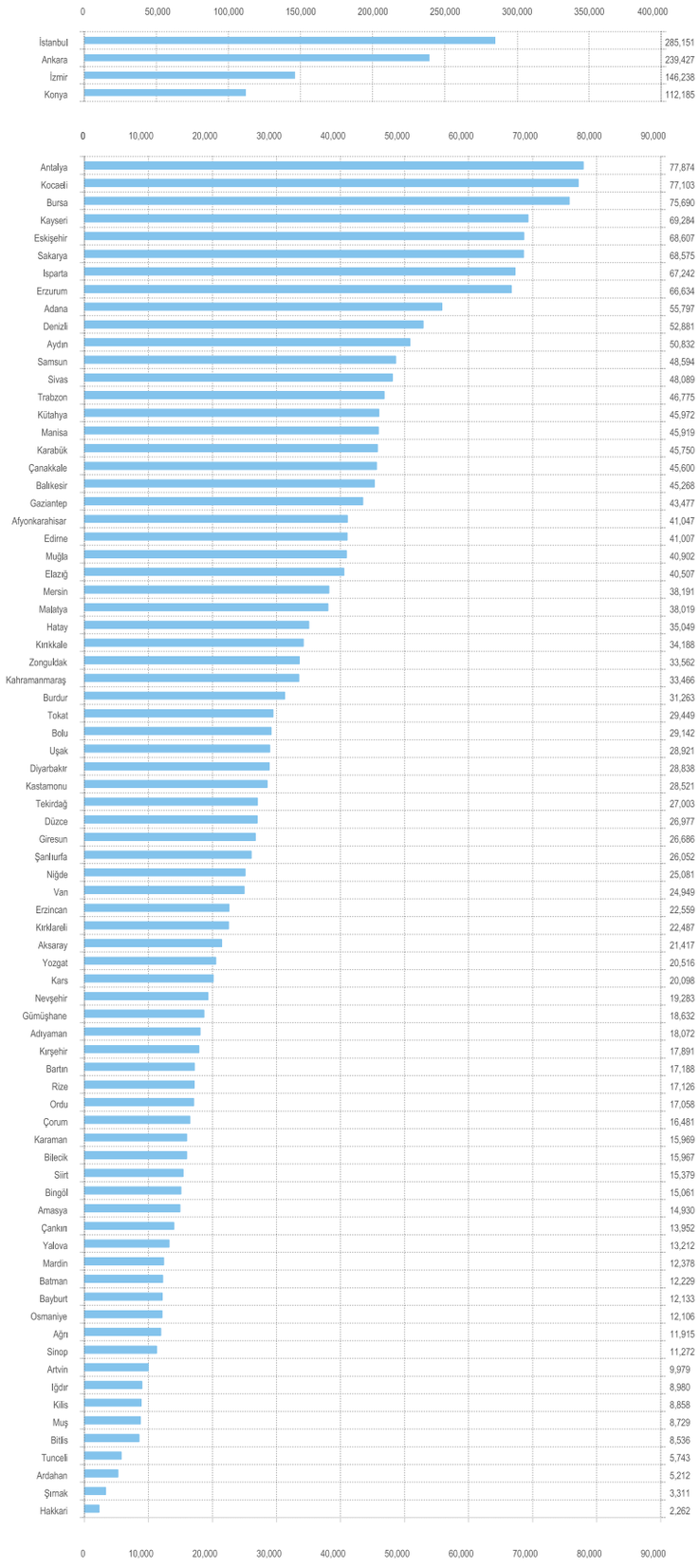
Table B.3.3 Change in student shares (%) by education level and type of education in state higher education institutions (2009, 2014 and 2019)

	State (face-to-face)			State (open education)		
	2009	2014	2019	2009	2014	2019
Associate Degree	56.6	43.0	29.0	43.4	57.0	71.0
Bachelor's Degree	47.5	49.0	49.4	52.5	51.0	50.6

Source: Prepared using the Higher Education Information Management System and ÖSYM data.

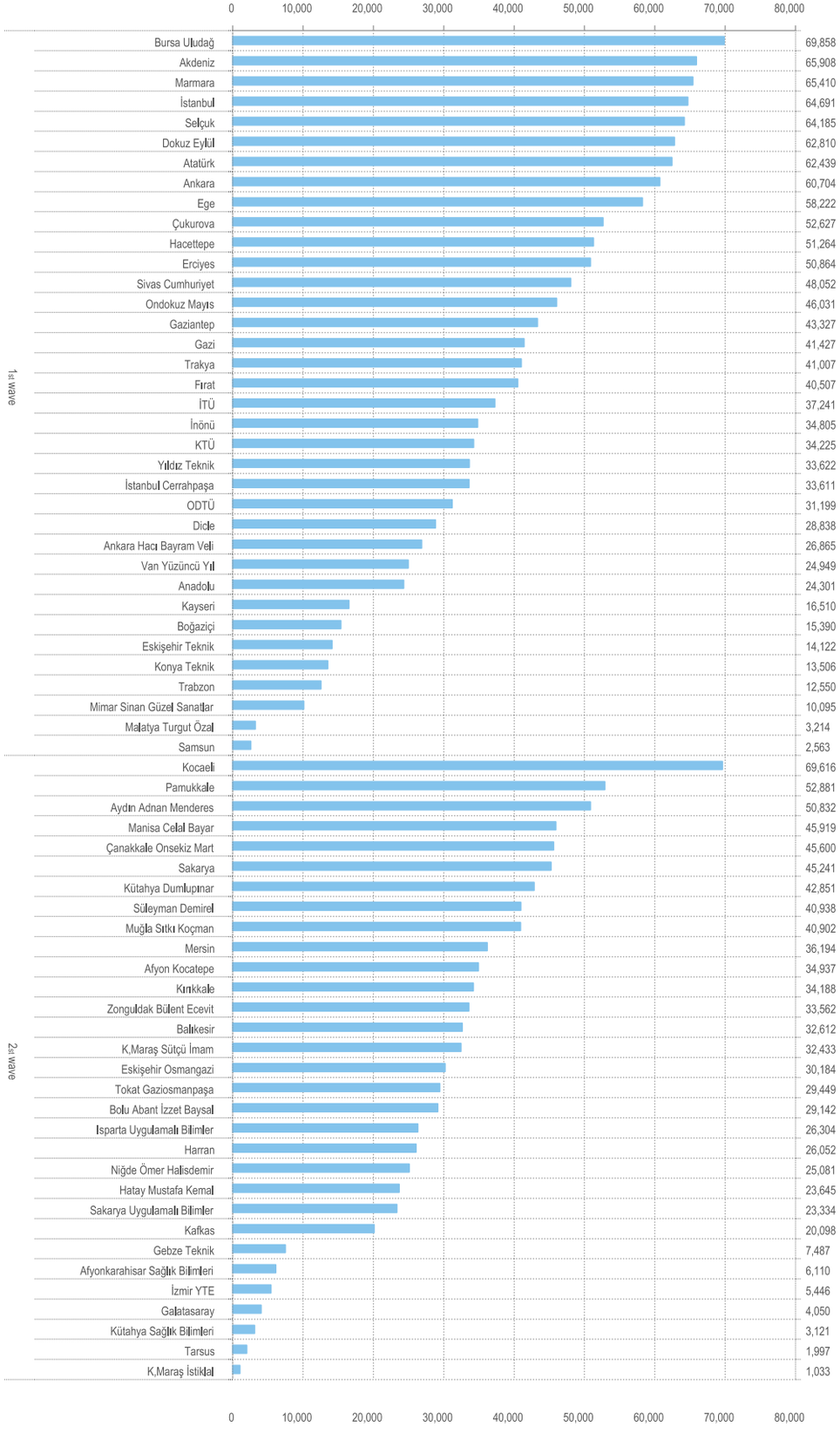
In Figure B.3.5 and Figure B.3.6, the number of students in state higher education institutions established in the first, second and third wave are given. The striking point here is that there is a big difference between the sizes of higher education institutions in each wave. The main reason for this is that some of the higher education institutions established in each wave have turned into higher education institutions that shoulder the burden of mass education. In other words, there are many higher education institutions with tens of thousands of students in all three waves.

Figure B.3.4 Distribution of students in state higher education institutions by province (2019)



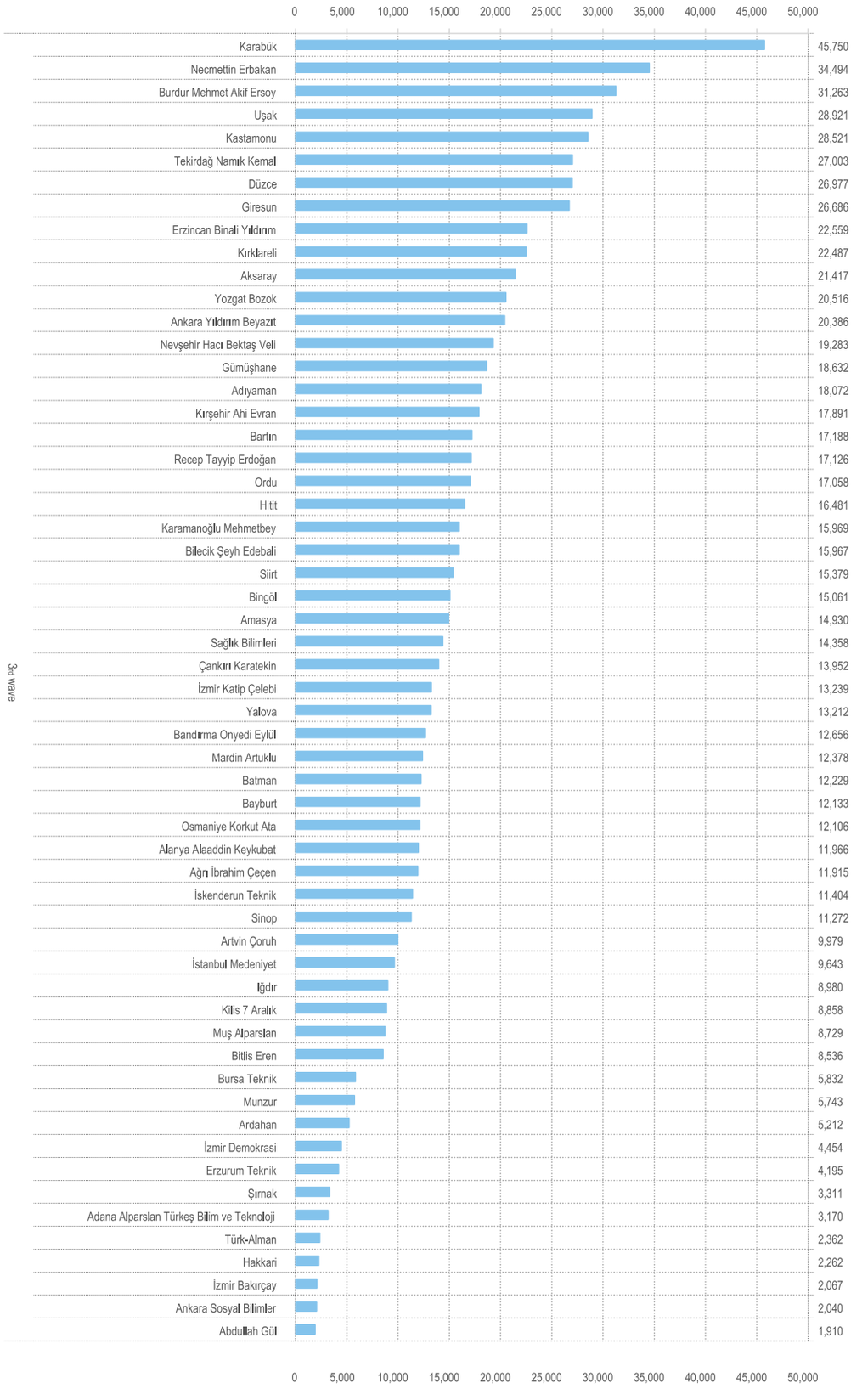
Source: Prepared using Higher Education Information Management System data.

Figure B.3.5. Number of students at first and second wave state higher education institutions (2019)



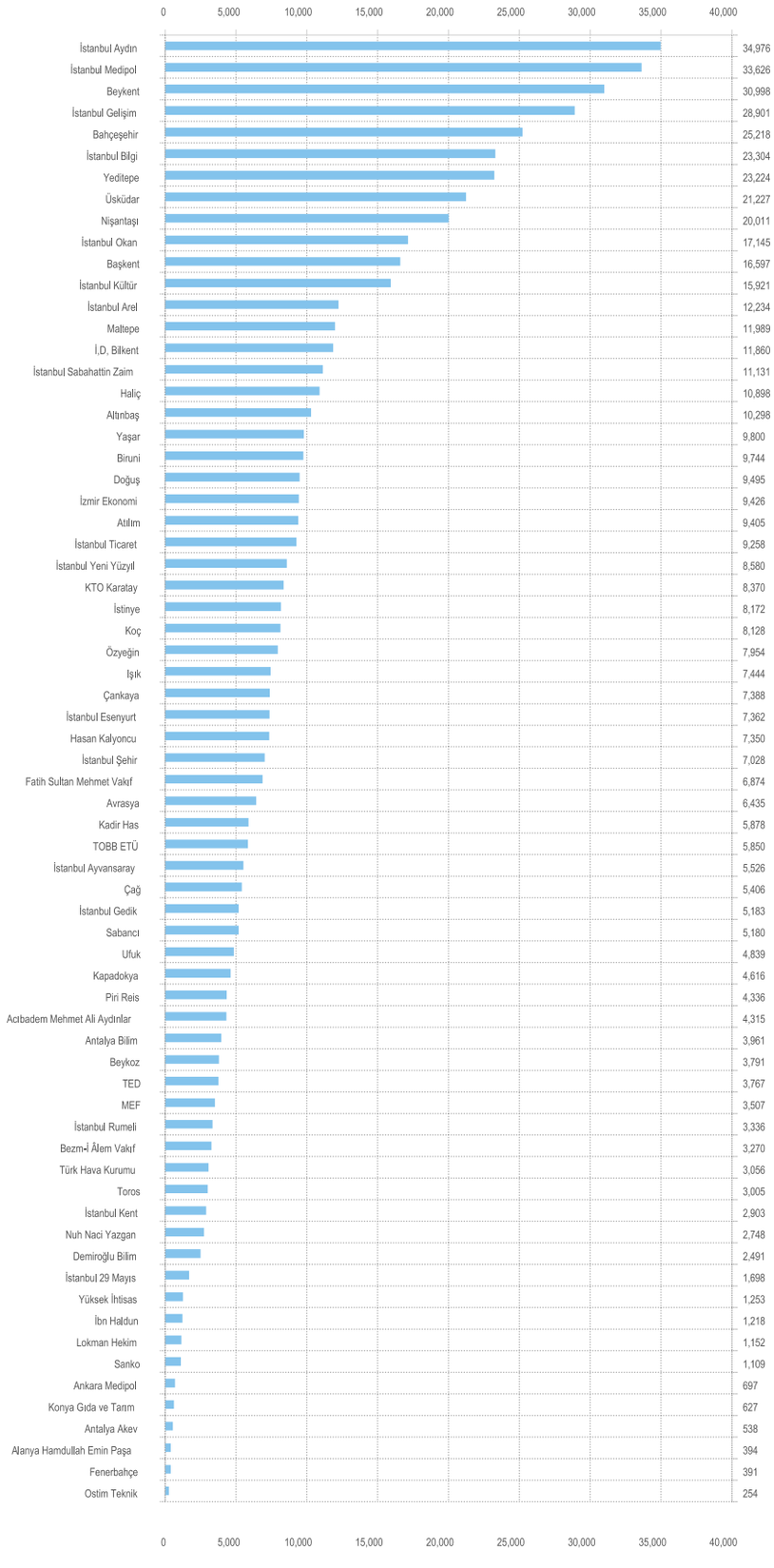
Source: Prepared using Higher Education Information Management System data.

Figure B.3.6. Number of students at third wave state higher education institutions (2019)



Source: Prepared using Higher Education Information Management System data.

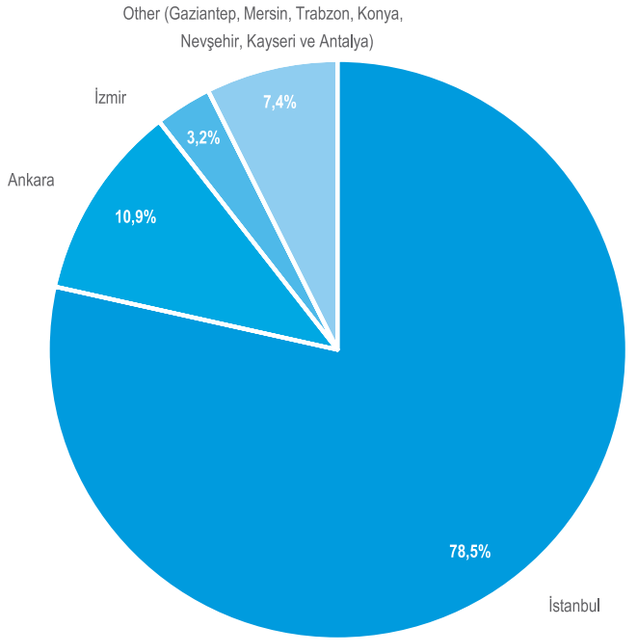
Figure B.3.7 Number of students at foundation higher education institutions (2019)



Source: Prepared using Higher Education Information Management System data.

The number of students in foundation higher education institutions for 2019 is given in Figure B.3.7. Similar to state higher education institutions, foundation higher education institutions also differ significantly among themselves in terms of the number of students. Turkey's first private university, I.D. Bilkent University, has close to 12 thousand students as shown in Figure B.3.8 which also shows the distribution of foundation universities according to region. Nearly four in five students in all private higher education institutions in Turkey are in Istanbul. While Ankara has 10.9% of the students in foundation higher education institutions, İzmir has 3.2% and

Figure B.3.8 Proportional (%) distribution of students in foundation higher education institutions by province (2019)

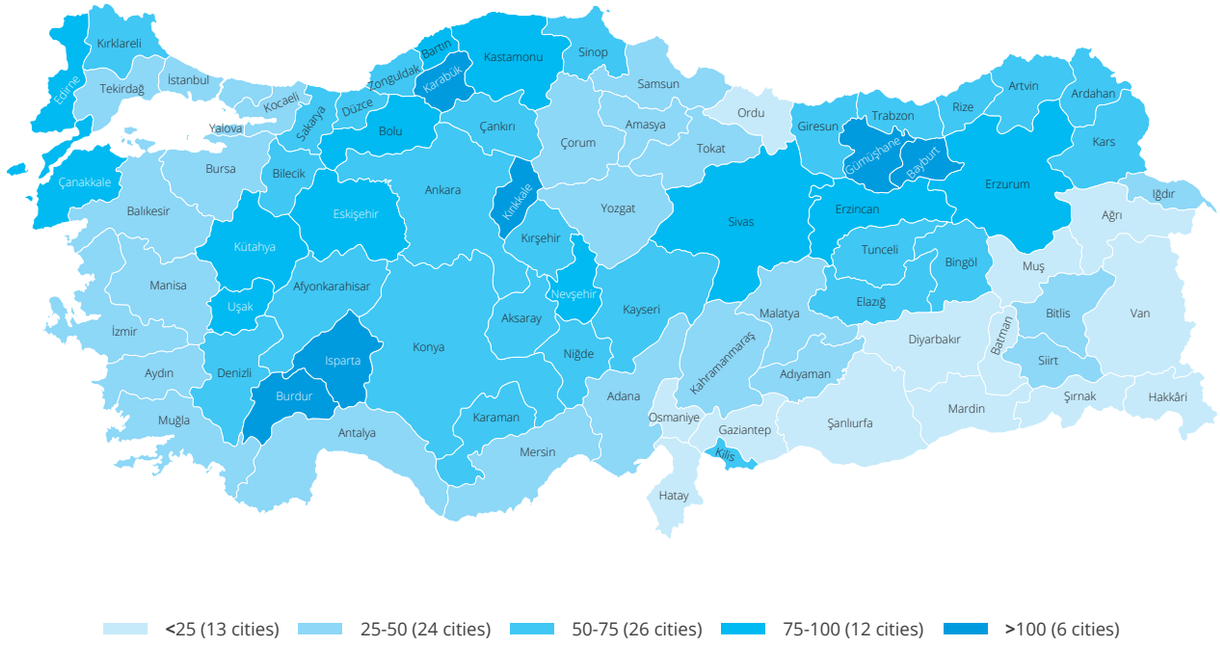


Source: Prepared using Higher Education Information Management System data.

other provinces have less and the number of students in many foundation universities established after that is higher. On the other hand, there are foundation universities that keep the number of students in the band of 5-10 thousand even though there has more than 20 years since their establishment.

The proportional distribution of students of foundation higher education institutions by provinces for 2019 is given in Figure B.3.8. Nearly four in five students in all private higher education institutions in Turkey are located in Istanbul. While Ankara has 10.9% of the students in foundation higher education institutions, İzmir has 3.2% and other provinces have less, the number of students in many foundation universities established after that is higher. On the other hand, there are foundation universities that keep the number of students in the band of 5-10 thousand even though it has been more than 20 years since their establishment. This data shows that there are no policies in Turkey which target the distribution of foundation higher education institutions in provinces and regions. State and foundation higher education institutions in many provinces cite not being able to find students as a major problem.

Map B.3.9 Number of higher education students per thousand people by province (2019)



Source: Prepared using TURKSTAT Address Based Population Registration System data and Higher Education Information Management System data.

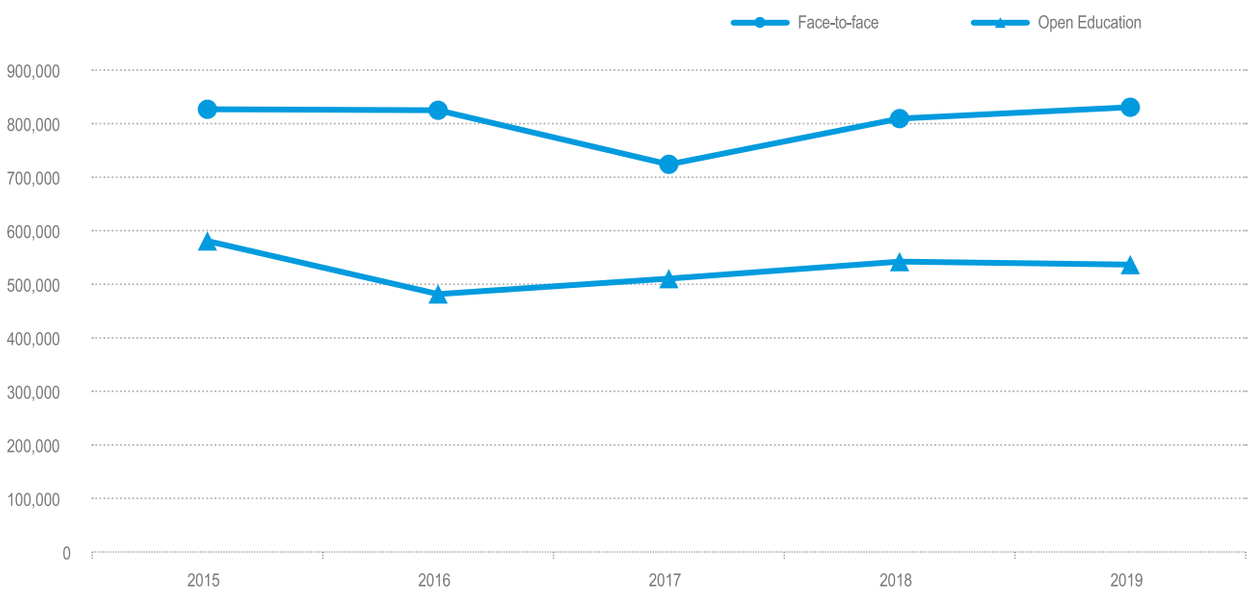
Map B.3.9 shows the number of higher education students per thousand people by province for 2019 is shown. According to this, Karabük (184 students), Isparta (151 students), Bayburt (143 students), Kırıkkale (121 students), Burdur (115 students) and Gümüşhane (113 students) have the highest number of higher education students per thousand people in their population. On the other hand, the provinces with the lowest numbers of higher education students per thousand people in their population are Şırnak (6 students), Hakkari (8 students), Şanlıurfa (13 students), Mardin (15 students), Diyarbakır (16 students), Batman (20 students),Gaziantep (21 students), Muş (21 students), Hatay, Van, Ağrı and Osmaniye (22 students) and Ordu (23 students). In the provinces of Istanbul, Ankara, Izmir and Konya, where the number of students is high in terms of both state and foundation higher education institutions (see Figure B.3.4 and Figure B.3.7), the number of students per thousand people is 49, 54, 38 and 63, respectively. We can see that the number of higher education students in provinces, which are generally described as student cities, is not much higher than the actual population.

INDICATOR B4

WHAT IS THE NUMBER OF STUDENTS IN OPEN AND DISTANCE LEARNING PROGRAMS?

As of the 2019-2020 academic year, three universities, Anadolu University, Atatürk University and Istanbul University, have open education or distance education faculties. In addition, the Faculty of Economics and Business within Anadolu University also offers open education programs. These faculties also show the change in the number of newly enrolled students between 2015 and 2019 according to the type of education in Figure B.4.1. The number of new face-to-face registrations rose slightly from 827 thousand to 831 thousand with small increases and decreases. These programs offer the opportunity to enroll an

Figure B.4.1 Trends in the number of newly enrolled students by type of education (2015-2019)

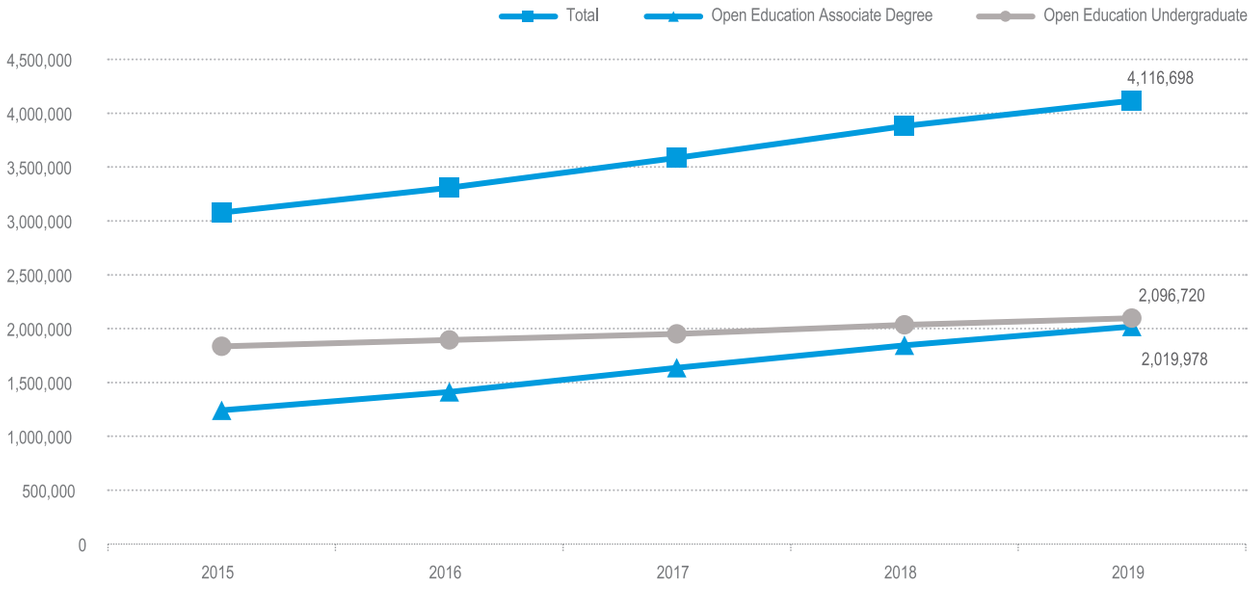


Source: Prepared using data from Higher Education Information Management System and the Outlook on Higher Education in Turkey 2019 Report.

open education programs ("second university") without examination for those who graduated from the open education secondary education institution or are still students in higher education institutions. This indicator will examine the number of open education and distance education students in detail.

The change in the number of newly enrolled students between 2015 and 2019 according to the type of education is given in Figure B.4.1. The number of new face-to-face registrations rose slightly from 827 thousand to 831 thousand with small increases and decreases. The number of new registrations has also decreased from 581 thousand to 537 thousand with fluctuations. While Turkey has experienced a static pace in distance education and in face-to-face higher education, the total number of face-to-face students has decreased (see. Figure B.3.2 and B.4.1 Figure).

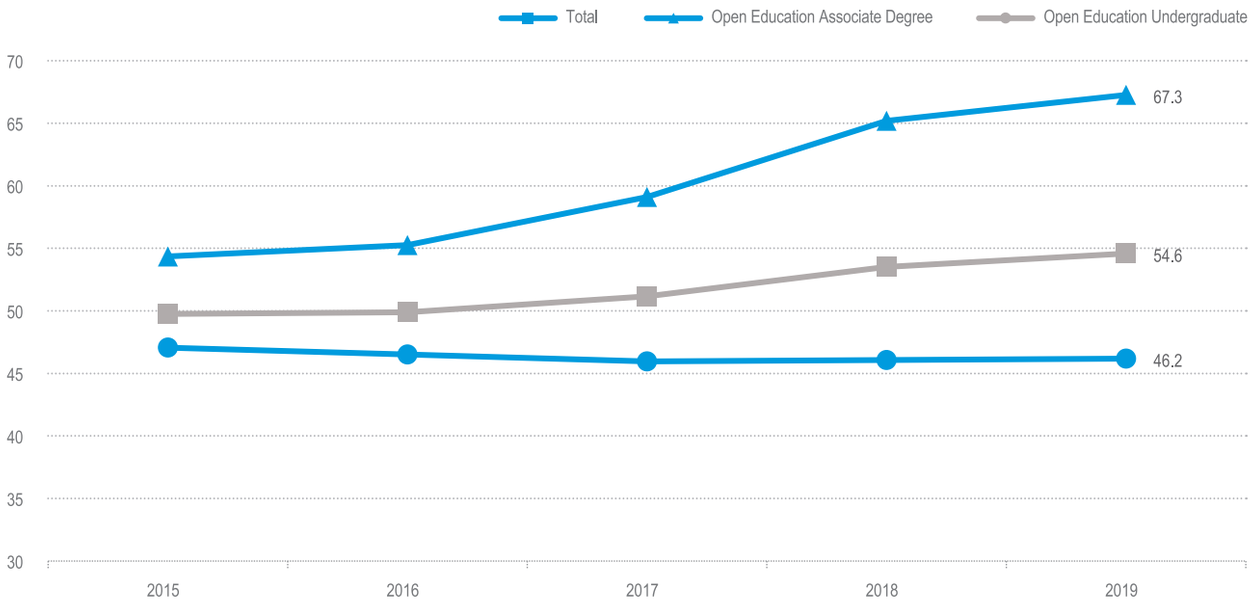
Figure B.4.2 Trends in the number of open education students by level of education (2015-2019)



Source: Prepared using data from the Higher Education Information Management System and the Outlook on Higher Education in Turkey 2019 Report.

The change in the number of open education students between the years 2015-2019 according to their education level is given in Figure B.4.2. There was an increase in the total number of students at both the associate degree and the undergraduate level. However, the increase in the associate degree level is more than the increase in the undergraduate level. As a matter of fact, when we look at the change in the rate of open education students in the total number of associate and undergraduate students between the years 2015-2019 (Figure B.4.3), the share of open education in undergraduate degree remained almost constant, while the share of open education in associate degree increased from 54% to 67%. In other words, two out of every three students at the associate degree level are enrolled in an open education program.

Figure B.4.3 Trends in the rate of open education students (%) in the number of associate and undergraduate students (2015-2019)



Source: Prepared using data from the Higher Education Information Management System and the Outlook on Higher Education in Turkey 2019 Report.

The number of students according to education level in universities that implement open education programs for 2019 is given in Table B.4.4. 3 million 436 thousand out of 4 million 117 thousand open education students study at Anadolu University. The number of open education students at Anadolu University is about 70 thousand, a number that is about 49 times the number of students at Uludağ University in Bursa, one of Turkey's largest universities.

Table B.4.4 Number of students by education level in universities implementing open education programs (2019)

University - Faculty	Associate Degree			Bachelor's Degree			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Anadolu University Open Education	754,353	865,128	1,619,481	173,149	207,452	380,601	927,502	1,072,580	2,000,082
Anadolu University Economical Sciences	-	-	-	423,646	275,675	699,321	423,646	275,675	699,321
Anadolu University Faculty of Economics	-	-	-	466,746	270,219	736,965	466,746	270,219	736,965
Atatürk University Open Education	131,657	170,574	302,231	30,872	31,862	62,734	162,529	202,436	364,965
Istanbul University Open and Distance Education	37,533	60,733	98,266	71,995	145,104	217,099	109,528	205,837	315,365
Total	923,543	1,096,435	2,019,978	1,166,408	930,312	2,096,720	2,089,951	2,026,747	4,116,698

Source: Prepared using Higher Education Information Management System data.

Table B.4.5 Number of students according to the top 10 programs with the highest number of students in universities implementing open education associate degree programs (2019)

University - Faculty	Associate Program	Male	Female	Total
Anadolu University - Open Education Faculty	Justice	149,467	126,601	276,068
Atatürk University - Open Education Faculty	Theology	101,427	148,116	249,543
Atatürk University - Open Education Faculty	Social Services	38,513	125,228	163,741
Atatürk University - Open Education Faculty	Management of Health Institutions	33,118	64,730	97,848
Atatürk University - Open Education Faculty	Public Communication and Advertising	43,434	50,068	93,502
Atatürk University - Open Education Faculty	Occupational Health and Safety	44,991	24,676	69,667
Atatürk University - Open Education Faculty	Child Development	2,486	66,645	69,131
Atatürk University - Open Education Faculty	Banking and Insurance	23,775	34,781	58,556
Atatürk University - Open Education Faculty	Laboratory and Veterinary Health	23,432	32,991	56,423
Atatürk University - Open Education Faculty	Foreign Trade	26,391	20,476	46,867

Source: Prepared using Higher Education Information Management System data.

The number of students according to the top 10 programs with the highest number of students in universities applying open education associate and undergraduate programs for 2019 is given in Table B.4.5 and Table B.4.6. The main function of each of these open education programs is to make hundreds of thousands of people easily certified and offer higher education degrees.

A development in 2020 after the establishment of the Department of Psychology in the Faculty of Open and Distance Education of Istanbul University is quite meaningful in terms of showing the confusion in the open education policies. A quota for 500 students was allocated by the Higher Education Council to the Open Education Psychology Department, which was set to admit students for the first time in the 2020-2021 school year and was included in the Quota Guide. As a result of the reaction of psychology graduates claiming that "psychology cannot be taught through open education" and the transformation of this into a social media campaign, the issue attracted the attention of President Recep Tayyip Erdogan and the Presidency Education and Training Policy Board put the issue on the agenda. Then, upon the recommendation of the Policy Committee, the Open Education Psychology Program was removed from

Table B.4.6 Number of students according to the top 10 programs with the highest number of students in universities implementing open education associate degree programs (2019)

University - Faculty	Bachelor's Program	Male	Female	Total
Anadolu University – Economics	Management	416,249	249,227	665,476
Anadolu University – Economical Sciences	Public administration	193,011	101,759	294,770
Atatürk University – Open Education	Sociology	50,531	80,844	131,375
Anadolu University – Economical Sciences	International Relations	79,373	49,628	129,001
Anadolu University – Economical Sciences	Economics	60,292	44,434	104,726
Anadolu University – Economical Sciences	Finance	44,475	43,545	88,020
Istanbul University – Open and Distance Education	Child Development	6,037	74,913	80,950
Atatürk University – Open Education	Turkish Literature	23,707	49,571	73,278
Anadolu University – Economical Sciences	Labor Economics and Industry Relations	37,429	32,527	69,956
Atatürk University – Open Education	Healthcare Management	19,156	24,858	44,014

Source: Prepared using Higher Education Information Management System data.

the guide of the Higher Education Council. Many other members of the field who saw the successful social media campaign of psychology graduates stated that "sociology cannot be taught through open education", "child development cannot be taught through open education", etc. These campaigns have yet to yield any results. In summary, a decision was made specific to the field of psychology, but no decision was taken that changed the general functioning of open education.

The number of distance education students according to the type of higher education institution and education level for 2019 is given in Table B.4.7. There are 27 thousand students at the associate degree level, 44 thousand at the undergraduate level and 11 thousand at the graduate level. It is interesting that the number of distance education students is so low in a higher education system where the total number of students in open education is 4 million 117 thousand. Additionally, since March the coronavirus pandemic has caused all higher education institutions in Turkey to move to distance education. It is a matter of curiosity whether there will be a tendency towards distance education programs in the coming years after this experience.

Table B.4.7 Number of distance education students by higher education institution type and education level (2019)

	Associate Degree	Bachelor's Degree	Master's Degree
State university	25,249	44,275	9,522
Foundation university and foundation vocational schools	2,012	200	1,845
Total	27,261	44,475	11,367

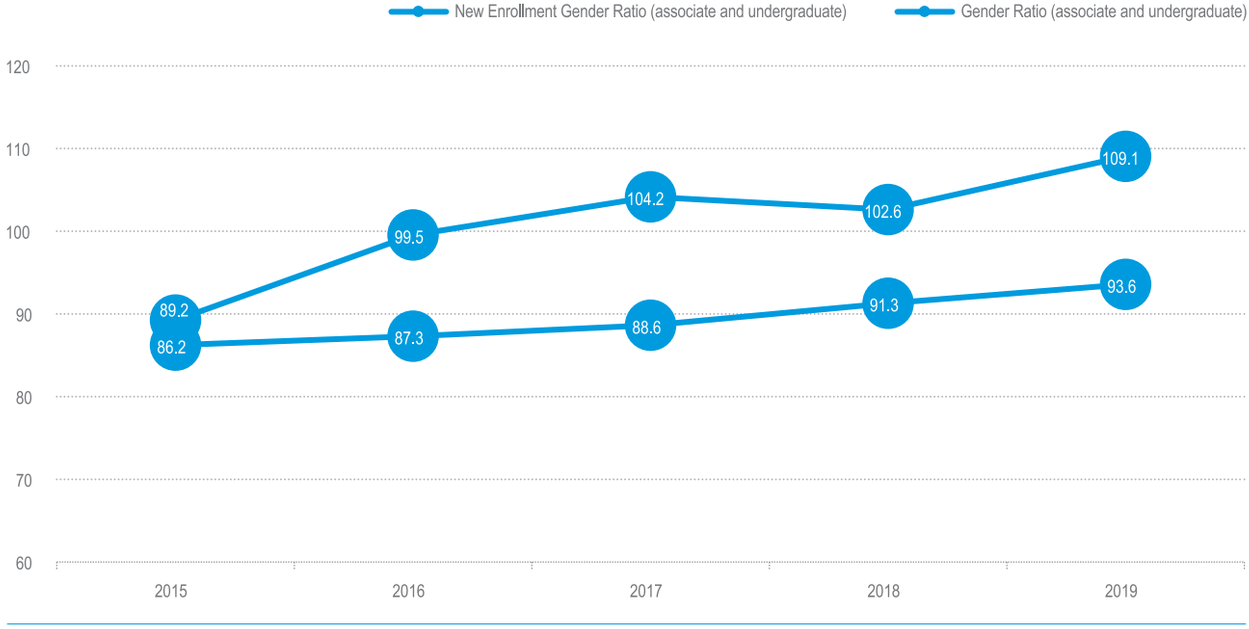
Source: Prepared using Higher Education Information Management System data,

INDICATOR B5

WHAT IS GENDER RATIO IN HIGHER EDUCATION ATTENDANCE?

This indicator examines the gender ratios of higher education student. The gender ratio is obtained by dividing the number of female higher education students by the number of male higher education students and multiplying by 100. This rate shows the relative size of the female schooling rate in any academic year compared to the male schooling rate (MEB, 2019).

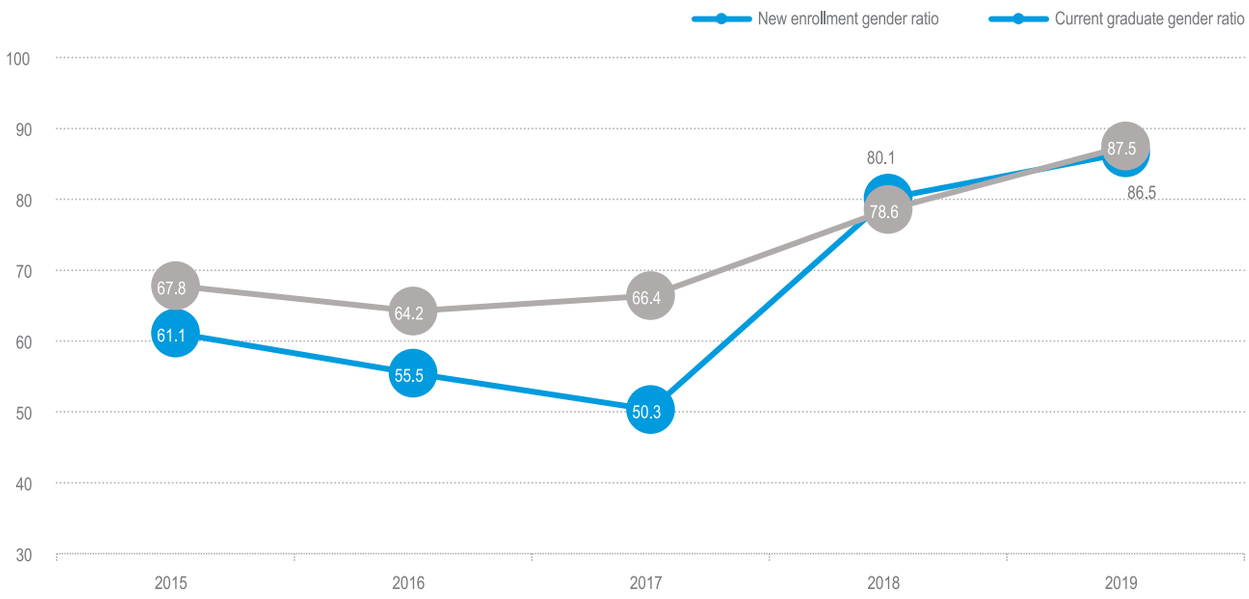
Figure B.5.1 Trends in gender ratio of newly enrolled and current associate and undergraduate students (2015-2019)



Source: Prepared using Higher Education Information Management System data.
Note: Open education has been included.

The change in gender ratio of newly registered and existing associate and undergraduate students between 2015-2019 is given in Figure B.5.1. The number of female students is new compared to the number of male students. This rate shows the relative size of female schooling rate in any academic year compared to male schooling rate (MEB, 2019). Enrollments generally display an increase. As a result, the share of female students among current student is increasing steadily.

Figure B.5.2 Trends in gender ratio of newly enrolled and current graduate students (2015-2019)



Source: Prepared using Higher Education Information Management System data.

The change in gender ratio of newly enrolled and current graduate students between 2015-2019 is given in Figure B.5.2. The number of female students increased significantly in 2018 and 2019 in new enrollments compared to the number of male students. As a result, the share of female students among current students has increased steadily.

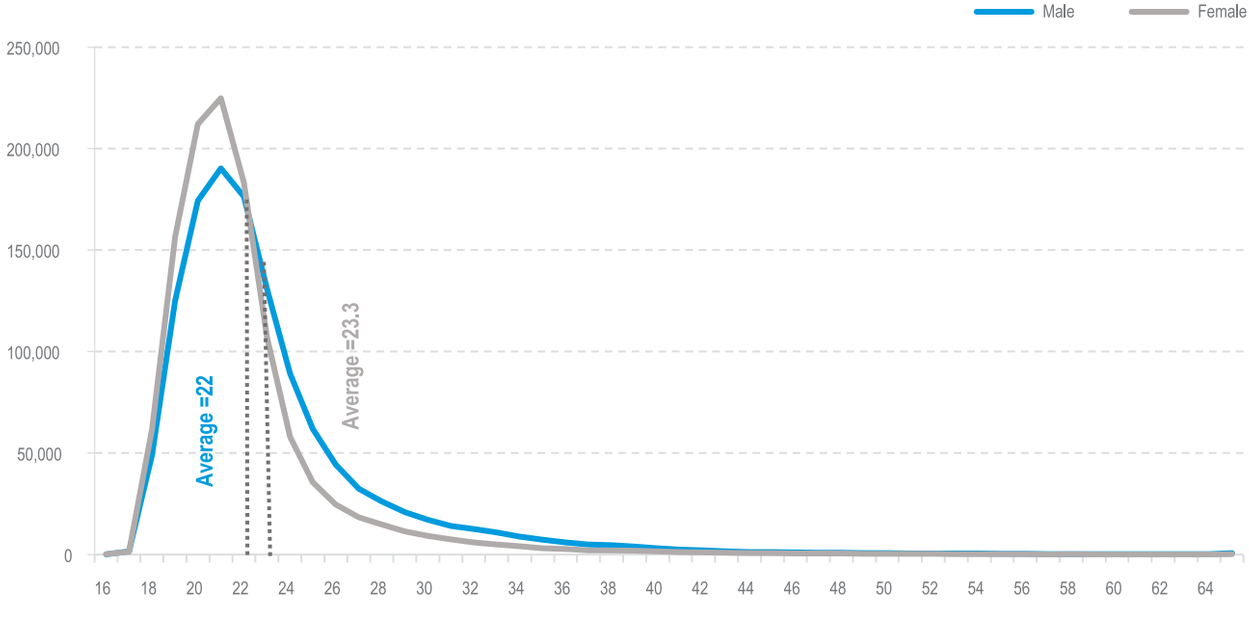
INDICATOR B6

HOW IS THE AGE DISTRIBUTION IN HIGHER EDUCATION?

This indicator will examine the frequency distributions and averages of male and female students at undergraduate level by age.

For 2019, frequency distributions are given by gender according to the ages of undergraduate students. We can see that the average of female students is lower than that of male students. Two possible reasons for this are that in recent years, young women (especially those who have just completed high school) have benefited from higher education opportunities and men have completed their undergraduate education at a relatively later age.

Figure B.6.1 Frequency distribution of undergraduate students according to gender and age (2019)



Source: Prepared Higher Education Information Management System data.

Note: The numbers of open and distance education students have been excluded.

CHAPTER B

CONCLUSIONS AND RECOMMENDATIONS

- As of 2019, some of the risks that we have highlighted in our *Outlook on Education in Turkey* reports have continued since 2016. At the forefront of these risks is the existence of a young population In Turkey which is not offered sufficient opportunities of face-to-face higher education. In this context, the decrease in the number of face-to-face students is a very important problem that we have drawn attention for several years. What is perhaps even more worrisome is that fact that while there is a stagnation in the total number of students in foundation higher education institutions and a decrease in the total number of hundred-to-one students in state higher education institutions, the total number of students in public open education programs continues to increase. While Turkey exhibits and upward trend in the total number of students in higher education, we should not be overlooking the fact that this increase stems from open education. We see that an increase originating from open education overshadows the decrease in the total number of students in state higher education institutions. As we have emphasized for a long time, the high share open education in the higher education system puts Turkey in quite an unfavorable situation in terms of the reputation of the higher education system (Gür et al., 2017, 2018, 2019). While the number of young people graduating from secondary education continues to increase, the total number of higher education students has not increased in recent years. Yet, there is still no clear strategy on how to respond to the increasing demand for higher education (Gur, 2016). In order to produce better quality growth and respond to the increasing demand for higher education of higher education system, Turkey should increase the number and capacity of face-to-face programs. The mission of open education in the current system should be redefined. The share of open education in higher education should be reduced and an efficient system with high social prestige should be built.

- Without decreasing the share of open education, merely decreasing the share of evening education in the system means reducing face-to-face education opportunities and not using resources effectively. Evening education is a teaching method that does not require any additional investment or personnel as it uses physical and human resources already prepared for normal education. Despite this, evening education programs and departments are being closed one by one and physical and human resources are inactive, so the opportunity for face-to-face education decreases every year. The pandemic period we are in has also shown that distance education takes the place of face-to-face education and training requires good planning. Therefore, policies should be developed to increase the share of face-to-face education opportunities in the system, not the share of open education.

- Parallel to the decrease in the total number of face-to-face students in recent years, there has been a decrease in the 18-22 age group net higher education enrollment rate for the first time. Between 2017 and 2018, this rate decreased from 45.6% to 44.1%. In other words, there was a sharp drop of 1.5 points in a year. Considering that there are an average of 1 million 200 thousand people in each age group, a decrease of 1.5 points for the 18-22 age range means that a total of 90 thousand young people cannot access higher education. On the other hand, if an increase of 1.5 points was achieved instead of a 1.5 point decrease, then 180 thousand young people would be likely to benefit from higher education. One of the reasons for not increasing their net enrollment ratios is that some young people lose a year or a few outside of school for university preparation. Turkey's current means of increasing higher education enrollment rates for young people means that the country will to continue to lag behind other OECD countries in the 25-34 and 35-64 age range in the proportion of higher education graduates in subsequent years.

- Policies should be developed for a more balanced distribution of higher education institutions, especially foundation higher education institutions, throughout the country. Likewise, policies that will ensure a more balanced distribution of the total number of students among higher education institutions and thus increase the quality of education service should be implemented.

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CHAPTER C

OUTPUTS OF EDUCATION

This chapter will assess the overall performance of the higher education system in Turkey. Analysis of the population with regards to education rate and indicators on the annual number of graduates will be presented comparatively. Then, the indicators on the employment data of higher education graduates will be discussed. Finally, the average annual earnings of university graduates in Turkey will be compared with date from the Economic Cooperation and Development (OECD) countries.

INDICATOR C1

WHAT IS THE EDUCATION LEVEL OF THE POPULATION?

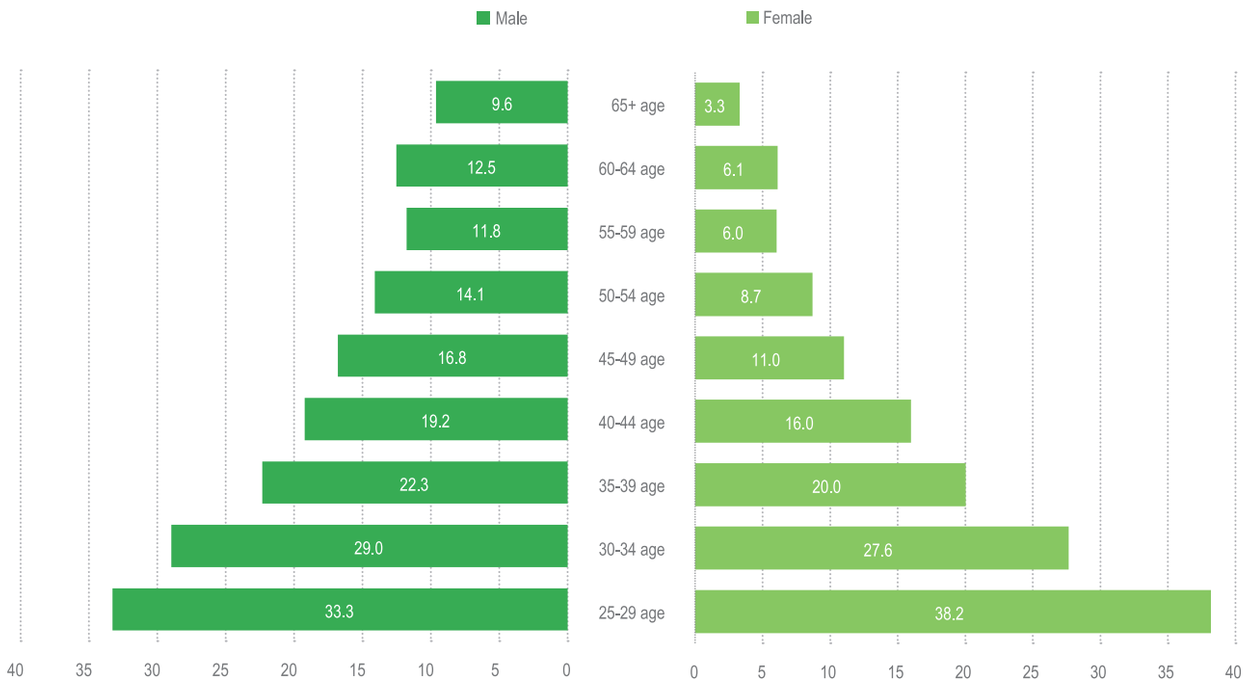
This indicator examines the graduates of higher education in Turkey based on gender and data relating to the distribution of graduates by age in comparison with OECD countries.

Figure C.1.1 Trends in the rate of higher education graduates (%) by gender, 25+ and 25-34 age groups (2015-2019)

Source: Prepared using data from the TURKSTAT National Education Statistics Database and the Outlook on Higher Education in Turkey 2019 Report.

Figure C.1.1 shows the change in higher education graduate rates between 2015 and 2019 by gender in the 25+ and 25-34 age groups. While the rate of higher education graduates in the 25+ age group was 13% for women, 17.7% for men and 15.3% in total in 2015, it increased to 15.8% for women, 19.6% for men and total Increased to 17.7. When the rates of higher education graduates in the 25-34 age group are examined, we can see that this rate was 26.7% for women, 27.3% for men and 26% in total in 2015, while it was 29.5% for both men and women in 2017, and in 2018 and 2019 the rate of women exceeded that of men. In 2019, the proportion of women who graduated from higher education in the 25-34 age group was 32.9%, while the proportion of men was 31.1%, and the total was 32%. In terms of the third wave universities established in 2006 and after, the number of higher education students increased as a result of the increased higher education quotas in 2008, leading to an increase in the rate of higher education graduates in both 25+ and 25-34 age groups (Gür et al., 2019). In addition, as women increasingly take advantage of increasing opportunities in secondary and higher education, net schooling in higher education has exceeded the rate of men in higher education since 2012 (Gür et al., 2018). Therefore, the proportion of women in the 25-34 age group amongst young university graduates in the general population exceeded that of men after 2017.

Figure C.1.2 Higher education graduation rates by age groups and gender (%) (2019)



Source: Prepared using the TURKSTAT National Education Statistics Database.

Higher education graduation rates by age groups and gender in 2019 are given in Figure C.1.2. The most striking point here is that while the rate of higher education graduates of men is higher than that of women in all age groups except the 25-29 age group, the rate of women with higher education in the 25-29 age group is higher than that of men. The ratio of women who are higher education graduates in the 25-29 age group in the population is 38.2%, while it is 33.3% for men. In the 30-34 age group, this rate is 29% for males and

Figure C.1.3 Rates of higher education graduates in 25+ and 25-34 age groups, by region and gender (%) (2019)

Source: Prepared using the TURKSTAT National Education Statistics Database.

27.6% for females. The difference in the ratio between women and men who are higher education graduates in the 25-29 age group (33.7% for women, 32.1% for men) according to 2016 data in the *Outlook on Education in Turkey* report and was considerably increased in 2019. As the age groups get older, the proportion of higher education graduates decreases and the ratio between men and women increases in favor of men. Considering the current indicators, it is likely that the proportion of women with higher education degrees in the population in the 30-34 and 35-39 age groups will exceed that of men in the coming years. As pointed out above, the main reason for this situation in favor of women is the increased higher education quotas, especially between 2008-2014, with rise of third wave universities established in 2006 and after.

In Figure C.1.3, the rates of higher education graduates in 25+ and 25-34 age groups are shown by regions and gender for 2019. While the proportion of higher

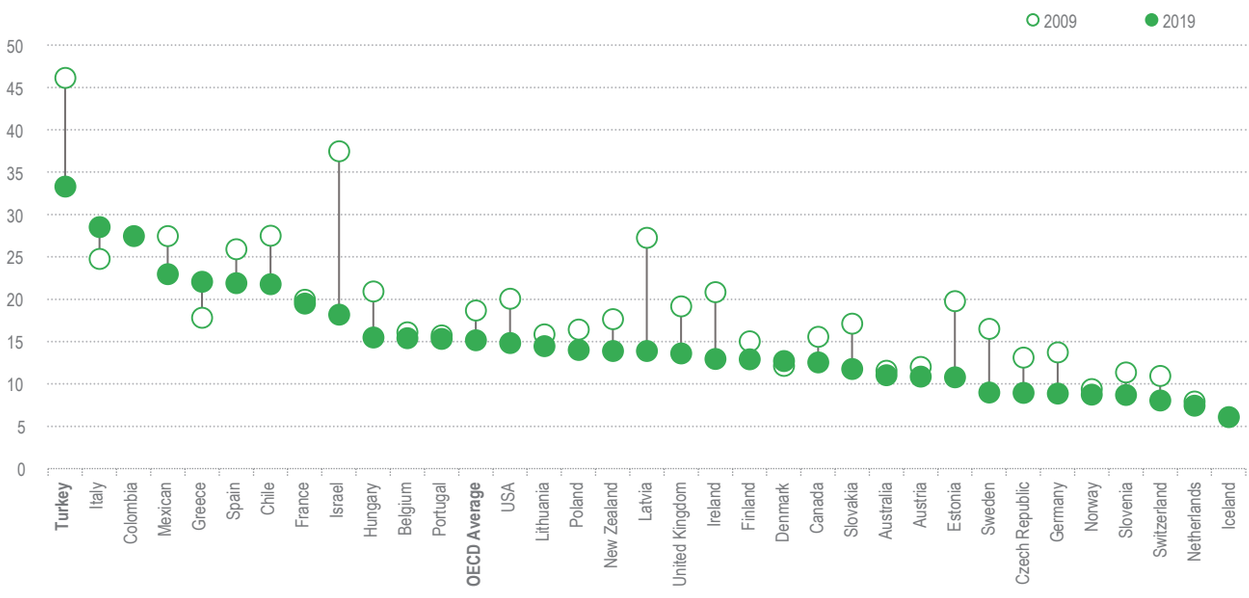
Figure C.1.4 Changes in educational attainment (%) of 25-34 year-olds between 2009 and 2019 in OECD countries by gender

	Male		Female		Total	
	2009	2019	2009	2019	2009	2019
Ireland	41	68	54	72	48	70
South Korea	58	64	63	76	61	70
Canada	49	55	63	71	56	63
Japan	52	59	59	64	56	62
Lithuania	36	45	51	66	44	55
Luxembourg	42	49	47	61	44	55
Switzerland	43	51	37	55	40	53
Australia	38	46	52	59	45	52
United Kingdom	43	49	47	55	45	52
USA	36	46	46	55	41	50
Netherlands	37	44	43	54	40	49
Norway	38	40	56	58	47	49
Sweden	37	41	48	56	42	48
France	39	44	48	52	43	48
Belgium	36	40	49	55	42	47
Denmark	30	39	45	56	37	47
Iceland	30	39	42	56	36	47
Israel	35	37	51	57	43	47
Spain	34	41	45	52	39	47
OECD Average	**32**	**39**	**41**	**51**	**36**	**45**
Slovenia	22	34	40	55	30	44
Latvia	22	34	41	55	32	44
Poland	28	34	43	54	35	43
Estonia	27	30	46	56	37	43
Greece	25	35	34	50	30	42
Finland	30	34	49	50	39	42
Austria	31	37	36	46	33	42
Slovakia	17	31	24	48	21	39
Portugal	18	29	29	45	23	37
Turkey	**17**	**35**	**16**	**36**	**17**	**35**
Chile	20	30	23	37	22	34
Germany	24	32	27	34	26	33
Czech Republic	18	26	22	39	20	33
Hungary	20	25	30	37	25	31
Italy	16	22	25	34	20	28
Mexico	17	23	17	24	17	24

Source: OECD (2020).

education graduates in the population in the 25+ age group differs significantly by both regions and gender - against women in all regions - the regional difference in the 25-34 age group increased even more, while the differences by gender in the regions decreased and developed in favor of women. There is a difference of 8.5% between the Western Anatolia Region (25.2%) and the Western Black Sea Region (16.6%) in the 25+ age group. In terms of female graduate rates, there is a difference of 9.2% between West Anatolia (20.2%) and the Southeastern Anatolia Region (11%). Western Anatolia (22.6%), Istanbul (20.6%) and Aegean (17.9%) ranked the above average in terms of the proportion of graduates of higher education in the 25+ age group, while Southeastern Anatolia (13.9%), Northeast Anatolia (14.1%), Black Sea (14.2%) and Central (14.9%) regions are well below the average of Turkey. When examining the proportion of graduates of higher education in the 25-34 age group, we see that there is a situation that does not favor women in Northeast Anatolia, Middle East Anatolia and Southeast Anatolia regions, when compared to other regions. The difference between the regions in terms of the highest and the lowest rates of higher education graduates for women and men in the 25-34 age group is even wider. The difference between West Anatolia (36.1%), where the proportion of men with higher education is the highest in the 25-34 age group, and the Southeastern Anatolia Region (27%), where it is the lowest, is 9.1%, where the proportion of women with higher education is the highest. The difference between the Eastern Black Sea Region (37.9%) and the Southeastern Anatolia Region (23%) is 14.9%. In addition, Western Anatolia (36.7%), Eastern Black Sea (35.7%), Istanbul (34%), East Marmara (33.9%), West Marmara (33.6%), Aegean (32.8%)) and West Black Sea (32%) ranked above average in the 25-34 age group in terms of the proportion of higher education graduates. Regarding the proportion of higher education graduates in the young age group, there is a situation in favor of women at the regional level. On the other hand, while the proportional difference between regions increases, this proportional difference effects women disproportionately.

Figure C.1.5 Change in the percentage of NEETs (young people neither employed nor in education or training) among 20-24 year-olds in OECD countries (2009 and 2019)



Source: OECD (2020).

Figure C.4.1 shows the change in higher education graduate rates between the ages of 25-34 in OECD countries from 2009 to 2019 by gender. Amongst all OECD countries, there was an increase in education rate for those aged between 25-34 from the year 2009 to 2019. Ireland (22% points), Turkey and Slovakia (19% points) experienced large increases alongside Norway (2% points), Finland (3% percentage points), Israel (4% percentage points). Belgium and France experienced increases of 5 percentage points or less. In Turkey from 2019 to 2009, the proportion of higher education graduates aged 25-34, went from 17% to 35% making in one of the countries to experience the largest increase. However, as of 2019, Turkey's current rate is 10% below the OECD average score of 45%. According to 2019 date, the OECD average is 39% for males and 51% for females in terms of higher education graduates between the ages of 25-34. In all OECD countries, higher education graduation rates for women aged 25-34 are higher than that of men. The difference between men and women ranges from 1 percentage points in Mexico to 26 percentage points in Estonia. This rate difference, except for a few European countries, is over 10% of the points while Turkey's score is slightly above 1%. If the current trends in Turkey continue, it seems that there will be a further increase the gap in favor of women in the coming years.

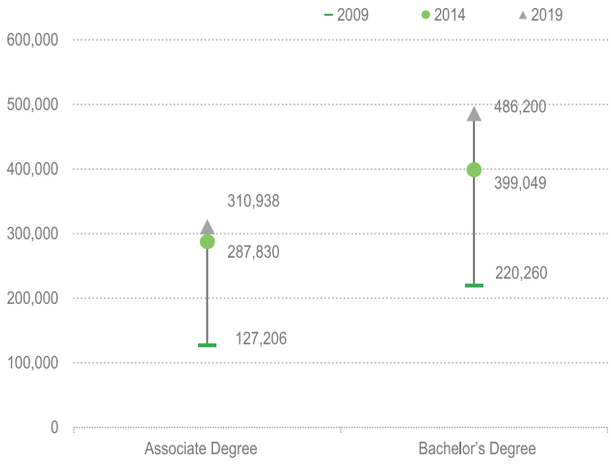
Figure C.1.5 shows the change in the rate of those who are neither at employed nor in education between the ages of 20-24 in OECD countries from 2009 to 2019. As seen in the figure, Israel (19.3% points), Latvia (13.4% points), and Turkey (12.8% points) have the highest rates of those among the 20-24 age that were neither employed nor in education between the years 2009-2019. Nevertheless, according to data from OECD countries in 2019, the percentage of those aged 20-24 that are neither employed nor in education was the highest in Turkey at 33,3%. Turkey is followed by Italy (28.5%) and Colombia (27.5%) in terms of this rate. This percentage is the lowest in Iceland (6.1%), the Netherlands (7.4%), Switzerland (8.1%), Slovenia (8.7%), Norway (8.7%), Germany (8.8%), Czechia (8.9%) and Sweden (9%). This fact that this ratio is high points to an inability in efficiently using manpower that will provide added value to the national economy, an inefficiency in education and human resources planning, therefore and insufficiency in employment opportunities and high unemployment rates.

INDICATOR C2

HOW HAS THE NUMBER OF HIGHER EDUCATION GRADUATES CHANGED?

This indicator examines the number of students graduating from different levels in higher education. In addition, the gender ratio of higher education graduates is surveyed.

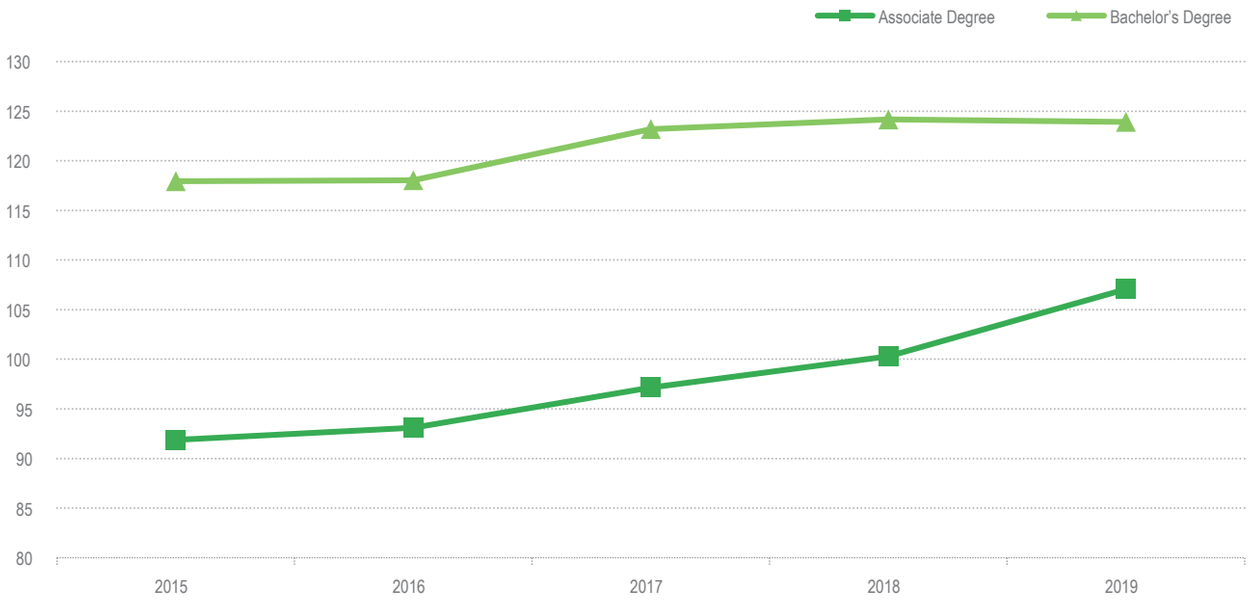
Figure C.2.1 Change in the number of higher education graduates by level of education (2009, 2014 and 2019)



Source: Prepared using the Higher Education Information Management System and ÖSYM data.

In Figure C.2.1. the change in the number of higher education graduates according to the education level for the years 2009, 2014 and 2019 is given. 127,206 people in 2009, 287,830 in 2014 and 310,938 in 2019 at the associate degree level, and 220,260 in 2009, 399,049 in 2014 and 486,200 in 2019 at the undergraduate level graduated from higher education. Compared to the previous year, the number of graduates at the associate degree level increased by approximately 5,500 and the number of graduates at the undergraduate level increased by 31,000 (Gür et al., 2019). The change in gender ratios of higher education graduates according to education level between 2015 and 2019 is shown in Figure C.2.2. The number of men who graduated at the associate degree level was higher than the number of

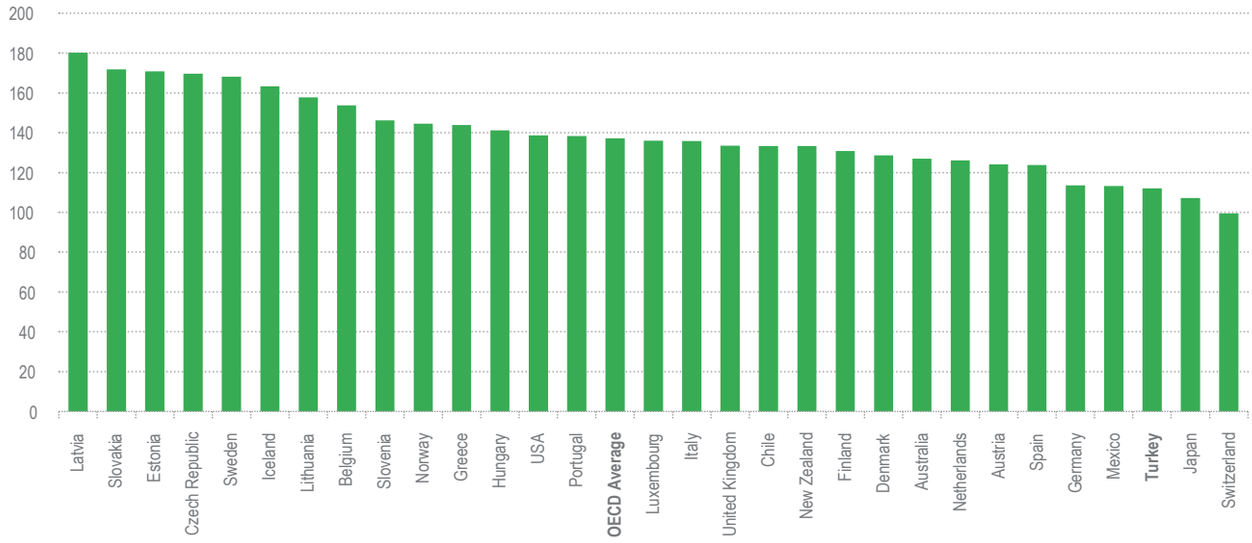
Figure C.2.2 Trends in gender ratios of higher education graduates by level of education (2015-2019)



Source: Prepared using Higher Education Information Management System data.

women who graduated between 2015-2017, while the number of women graduating from associate degree programs in 2018 and 2019 exceeded the number of men doing so. While the gender ratio of those who graduated from associate degree programs in 2015 was 92, this rate was 107 in 2019. At the end of the 2018-2019 academic year, 107 women graduated from the associate degree level for every 100 men. When the gender ratio of graduates for the undergraduate level is examined, the gender ratio, which was 118 in 2015, became 124 in 2019. In other words, for every 100 men who graduated at the undergraduate level, 124 women graduated. In summary, the graduation rates of women in the higher education system are constantly increasing at both the associate degree and undergraduate degree level.

Figure C.2.3 Distribution of first-time entrants into tertiary education by gender in OECD countries (2018)

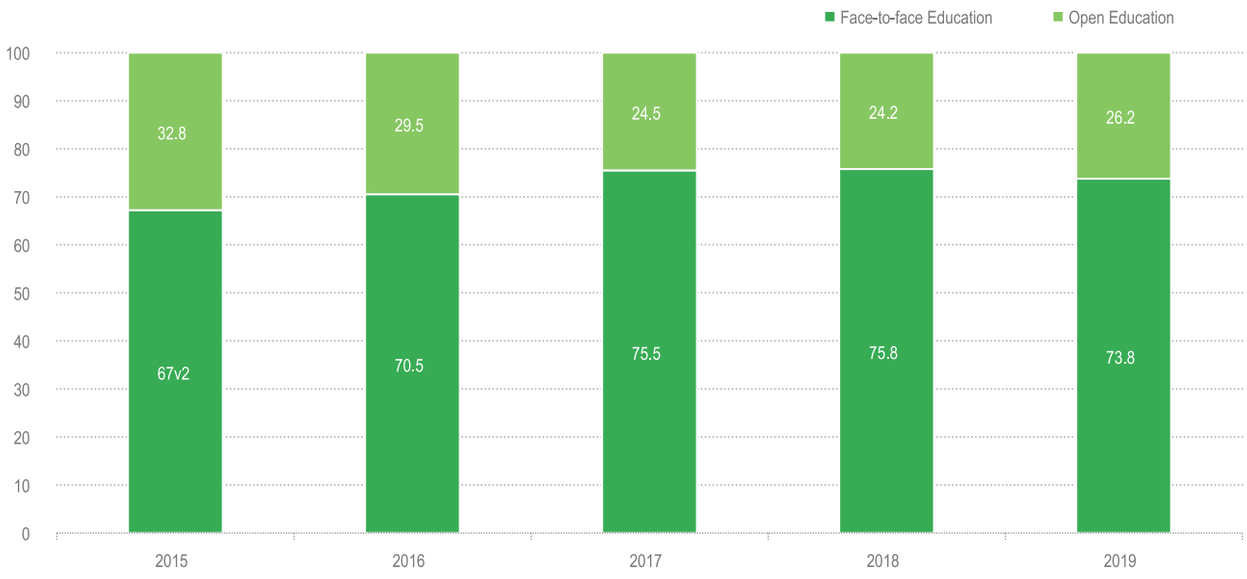


Source: OECD (2020).

The gender ratio of those who graduated from higher education for the first time in some OECD countries in 2018 is shown in Figure C.2.3. Considering data for 2018, all OECD counties except Switzerland (99), had a gender ratio of first-time higher education graduates above 100. The gender of first-time higher education graduates was 180 in Latvia, 172 in Slovakia, 171 in Estonia, 170 in Czechia, 168 in Sweden, 163 in Iceland, 158 in Lithuania, 154 in Belgium. This same rate was 99 in Switzerland, 107 in Japan, 112 in Turkey, 113 in Mexico and 114 in Germany. All countries, with the exception of Switzerland, favor women in terms of graduation rates. The gender ratio of graduates in favor of women is considered important for women to access better job opportunities.

Figure C.2.4 shows the change in higher education graduate rates between 2015 and 2019 according to the type of education. The rate of open education graduates among those who graduated from higher education between 2015 and 2018 decreased. The rate of open education graduates, which was 32.8% in 2015, decreased to 24.2% in 2018 and was 26.2% with a slight increase in 2019. Considering the students enrolled in the open education system, the number of students in the system has grown even more over the years. Since 2016, the number of students receiving face-to-face education in state higher education institutions has fallen behind the number of students in open education and the gap has continued to widen over the years (see Figure B.3.2).

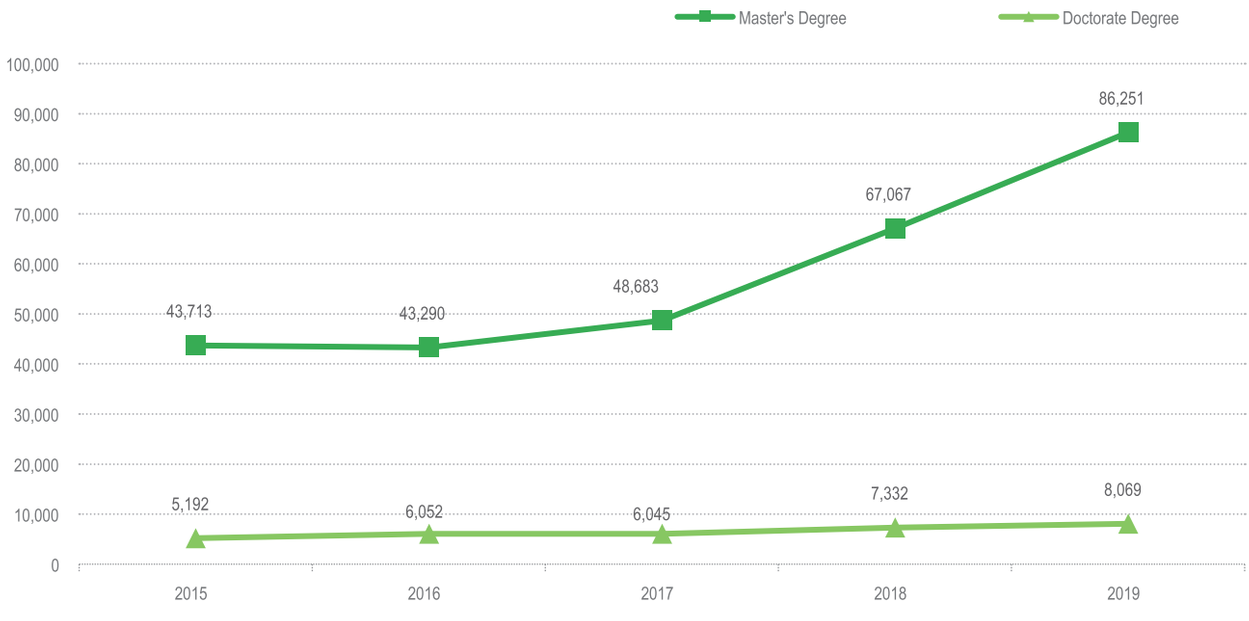
Figure C.2.4 Trends in higher education graduate rates (%) by type of education (2015-2019)



Source: Prepared using Higher Education Information Management System data.

The change in the number of masters graduates according to education level between 2015 and 2019 is shown in Figure C.2.5. While the number of graduates at the master's level in 2015 was 43,713, it gained rapid acceleration in 2017-2019 and was 86,251 in 2019. There is an increase of nearly 100% from 2015 to 2019 in the number of graduate students. The number of graduates at the PhD level increased from 5,192 in 2015 to 8,069 in 2019.

Figure C.2.5 Trends in the number of higher education graduates by level of education (2015-2019)



Source: Prepared using data from the Higher Education Information Management System and the Outlook on Higher Education in Turkey 2019 Report.

Table C.2.6 shows the top ten universities that offered the highest number of master's and doctoral degrees in 2018 and 2019. There is only one foundation university among the top ten universities with the most graduate degrees in 2019. Hacettepe and Bahçeşehir universities experienced a decrease in the number of master's graduates compared to the previous year. Marmara University is the university that gave the most graduate degrees with 3,893 people in 2019. Marmara University is followed by Istanbul (2.457), Gazi (2.115), Selçuk (2.045) and Sakarya (1.869) universities. The universities that offered the most doctorate degrees are Gazi (524), Istanbul (491), Hacettepe (435), Ankara (395) and Atatürk (283) universities.

Table C.2.6 Top ten universities with the most graduate and doctoral degrees (2018 and 2019)

University	Type	Number of Higher Education Graduates	
		2018	2019
Marmara University	State	2,262	3,893
İstanbul University	State	2,449	2,457
Gazi University	State	1,368	2,115
Selçuk University	State	1,782	2,045
Sakarya University	State	1,067	1,869
Yıldız Technical University	State	1,231	1,673
Hacettepe University	State	1,780	1,611
Bahçeşehir University	Vakıf	2,105	1,609
Dokuz Eylül University	State	1,238	1,586
ITU	State	1,359	1,459

University	Type	Number of Graduates	
		2018	2019
Gazi University	State	459	524
İstanbul University	State	541	491
Hacettepe University	State	419	435
Ankara University	State	413	395
Atatürk University	State	289	283
Marmara University	State	260	269
Ege University	State	257	252
METU	State	240	234
ITU	State	196	231
Anadolu University	State	167	201

Source: Prepared using Higher Education Information Management System data.

INDICATOR C3

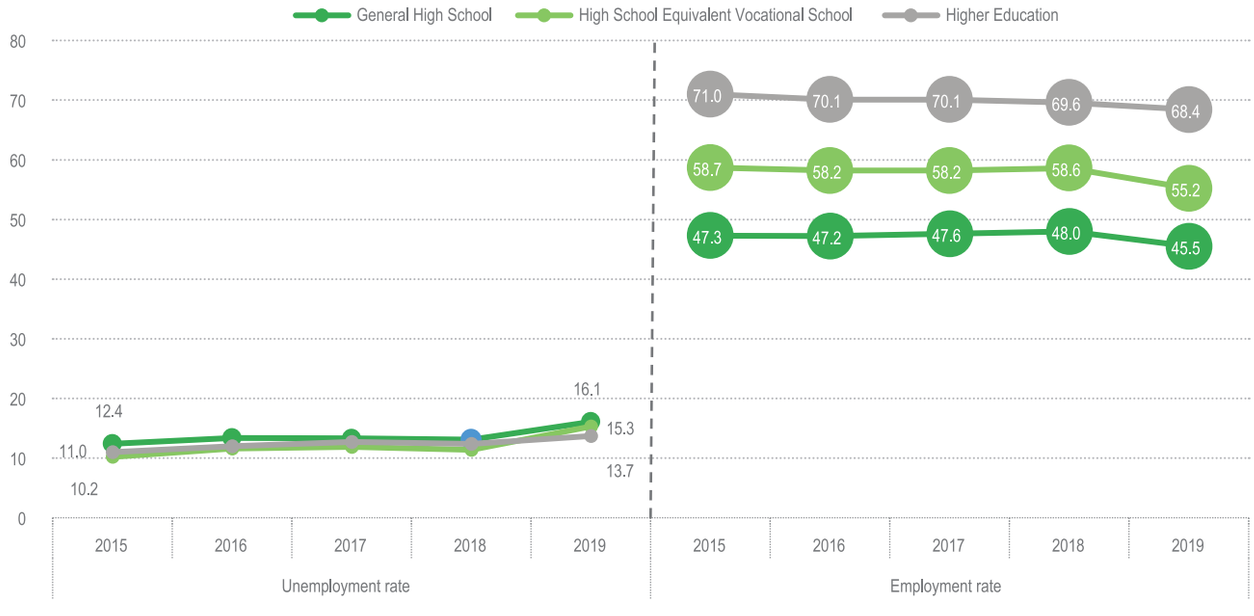
WHAT ARE THE EMPLOYMENT AND UNEMPLOYMENT RATES OF HIGHER EDUCATION GRADUATES?

This indicator examines the employment and unemployment rates of higher education graduates by region, gender and in comparison with OECD countries.

Figure C.3.1 shows the change in unemployment and employment rates of those over the age of 15 according to education level between 2015 and 2019. While the unemployment rate of general high school graduates was 12.4% and the rate of high school equivalent vocational school graduates was 10.2% in 2015, in 2019 these rates were 16.1% for general high school graduates and% for high school equivalent vocational school graduate and increased to 15.3. While the unemployment rate of higher education graduates was 11% in 2015, it increased to 13.7% in 2019. The unemployment rate of higher education graduates was less than that of general high school and high school equivalent vocational school graduates. This data shows that in general, the unemployment rate has increased in the last five years and is the least among higher education graduates. Therefore, the establishment of new universities and the increase in higher education graduates is not enough to explain the increase in the unemployment rate of higher education graduates.

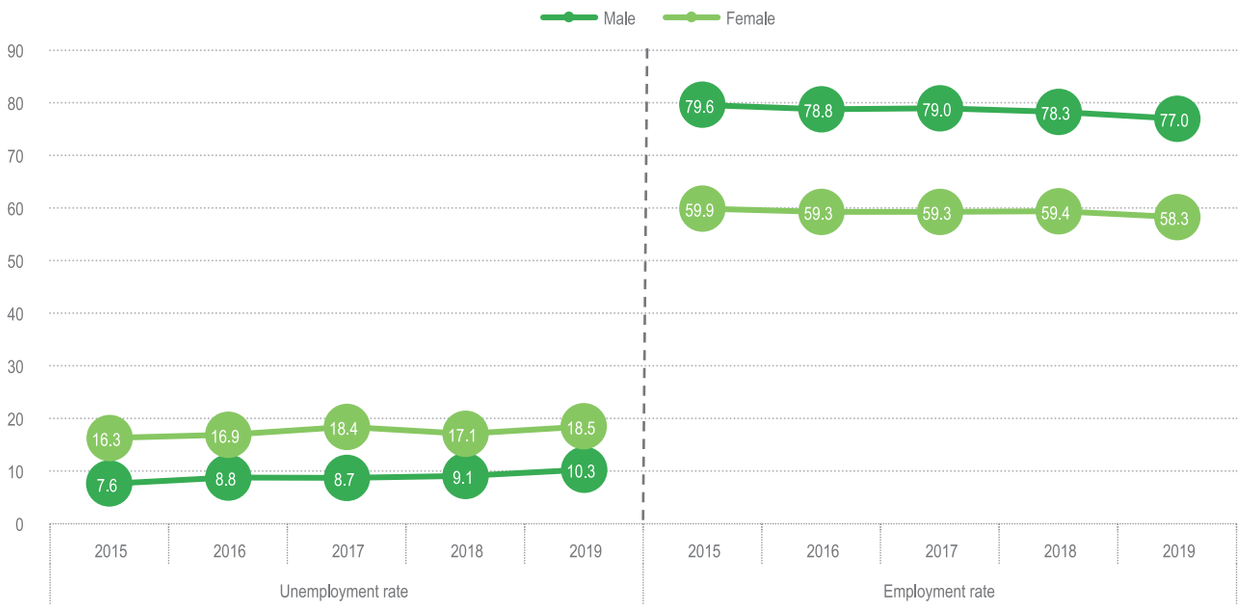
Looking at the employment rates, in 2015, while the employment rate of general high school graduates was 47.3% and 58.7% for high school equivalent vocational school graduates, in 2019 these rates were 45.5% for general high school graduates and 55.2 % for high school equivalent vocational school graduates. When the employment rates of higher education graduates are examined, the employment rate, which was 71% in 2015, tended to decrease continuously over the years, except for 2017, and was 68.4% in 2019.

Figure C.3.1 Trends in unemployment and employment rates (%) for those over the age of 15 by education level (2015-2019)



Source: Prepared using TURKSTAT labor force statistics the Outlook on Higher Education in Turkey 2019 Report.

Figure C.3.2 Trends in unemployment and employment rates (%) of higher education graduates over the age of 15 by gender (2015-2019)



Source: Prepared using TURKSTAT labor force statistics and the Outlook on Higher Education in Turkey 2019 Report.

The change in the unemployment and employment rates of higher education graduates over the age of 15 by gender between 2015 and 2019 is shown in Figure C.3.2. Between 2015 and 2019, while the unemployment rate of women with higher education is higher than that of men, their employment rate still remains low. Between the years of 2015-2019, the unemployment rate of women with higher education increased from 7.6% to 10.3%, and for men this rate increased from 16.3% to 18.5%. Between the years 2015-2019, employment rates fell from 59.9% to 58.3% for women and from 79.6% to 77% for men. When the decrease in employment rates

Figure C.3.3 Change in unemployment and employment rates (%) of higher education graduates over the age of 15 by region and gender (2019)

Source: Prepared using TURKSTAT labor force statistics.

of women and men with higher education degrees is analyzed, we can see that there is a 2.6% decrease for men and a 1.6% decrease for women.

Figure C.3.3 shows the change in the unemployment and employment rates of higher education graduates over the age of 15 by region and gender for 2019. The unemployment rates of higher education graduates differ according to employment rates both between regions and by gender. The unemployment rate of women who are higher education graduates is highest in Southeast Anatolia (29.7%), Middle East Anatolia (26.7%), Central Anatolia (24.2%), Eastern Black Sea (23.2%) and the Mediterranean (19.7%) region. The average in Turkey is 18.5%. The regions with the highest unemployment rate for higher education graduates are Southeast Anatolia (16.6%), Mideast Anatolia (13.8%),

Table C.3.4 Change in employment rates (%) of higher education graduates aged 25-34 by gender in OECD countries (2009 and 2019)

	Male		Female		Total	
	2009	2019	2009	2019	2009	2019
Lithuania	88	95	86	90	87	92
Netherlands	95	93	92	91	94	92
United Kingdom	90	93	84	88	87	90
Switzerland	93	93	86	87	90	90
Iceland	88	90	83	90	85	90
Norway	91	89	89	90	90	89
Slovenia	91	92	88	87	89	89
Latvia	90	92	79	87	83	89
Luxembourg	-	92	-	86	87	89
Poland	92	95	83	85	87	89
New Zealand	89	93	76	85	82	89
Germany	92	92	84	85	88	88
Israel	91	94	71	82	80	88
France	85	91	83	84	84	88
Portugal	91	90	89	86	90	88
Australia	87	89	84	86	86	87
Austria	87	89	80	86	83	87
Canada	89	89	84	85	86	87
USA	86	85	87	87	87	86
Finland	92	90	80	82	85	85
Chile	87	88	79	83	83	85
OECD Average	**88**	**89**	**80**	**81**	**84**	**85**
Denmark	88	87	88	82	88	84
Hungary	91	94	72	77	80	84
Estonia	94	96	70	75	79	83
Colombia		88	-	76	-	81
Mexico	88	88	76	75	82	81
Slovakia	90	93	72	70	80	79
Spain	83	81	79	76	81	79
Czech Republic	88	93	68	67	77	78
South Korea	84	81	64	72	74	76
Greece	84	80	78	68	81	73
Turkey	**85**	**83**	**68**	**62**	**77**	**72**
Italy	72	69	67	67	69	68

Source: OECD (2020).

Mediterranean (11%) and the Eastern Black Sea (10.5%) regions. The regions with the lowest unemployment rate for men who are higher education graduates are the West Black Sea (6.5%), West Marmara (7.2%) and West Anatolia (7.7%) regions. When the employment rates are examined by regions, the regions with the highest employment rates for women with higher education degrees are Istanbul (61.6%), the Aegean (59.3%), East Marmara (59.1%), Mediterranean (58.6%) and West Black Sea (58.4%) regions. The regions with the lowest employment rate for women with higher education are Southeast Anatolia (49.9%) and Mideast Anatolia (51.3%). The regions with the highest employment rates for male higher education graduates are the Western Black Sea (81.2%) and Central Anatolia (79.4%). The regions with the lowest employment rates for male higher education graduates are Southeast Anatolia (74.2%), Eastern Black Sea (74.6%), Aegean (74.7%) and Mideast Anatolia (74.8%).

Table C.3.5 Employment rates of higher education graduates aged 25-64 by education level in OECD countries (%) (2019)

	Associate	Bachelor's	Master's	Doctorate	Total
Iceland	82	89	96	98	92
Lithuania	-	91	91	100	91
Slovenia	86	90	91	95	90
Sweden	85	91	93	93	90
Netherlands	89	88	91	96	90
Norway	84	91	93	91	89
Switzerland	-	89	89	92	89
Germany	90	89	89	93	89
Latvia	89	90	89	98	89
Poland	73	87	89	98	89
Portugal	-	83	90	95	89
New Zealand	88	88	87	92	88
Israel	83	88	91	92	88
Denmark	87	85	91	94	88
United Kingdom	83	87	88	90	87
Estonia	84	85	89	91	87
Czech Republic	86	83	88	94	87
Austria	87	79	88	90	86
Belgium	81	85	88	93	86
Finland	84	85	89	97	86
Japan	82	89	-	-	86
Hungary	83	84	87	95	86
Ireland	80	85	89	93	86
OECD Average	**82**	**84**	**88**	**93**	**86**
Luxembourg	83	81	88	91	86
France	84	84	89	92	86
Australia	82	84	87	97	85
Chile	81	85	93	-	84
Canada	91	75	85	85	84
USA	82	84	85	-	83
Spain	78	82	86	90	83
Italy	79	81	84	90	82
İtalya	81	74	83	94	81
Colombia	-	81	-	-	81
Mexico	75	79	85	91	80
South Korea	77	77	85	-	78
Greece	65	75	82	88	76
Turkey	**65**	**75**	**84**	**92**	**74**

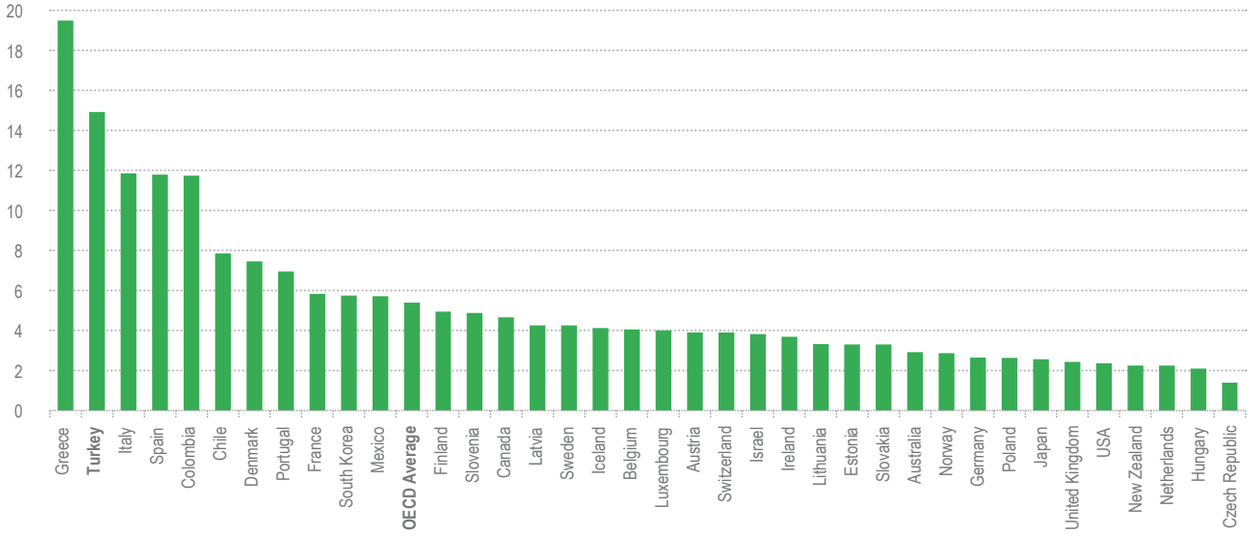
Source: OECD (2020).

Table C.3.4 shows the change in the employment rates of higher education graduates between the ages of 25-34 in OECD countries from 2009 to 2019 by gender. The employment rate of 25-34 year-old higher education graduates has decreased in 12 OECD countries, been stable in three OECD countries and increased in 22 OECD countries. From 2009 to 2019, the countries whose employment rates have dropped the most are Greece (8% points), Turkey (5% of points), Denmark (4% points) and Belgium (3% points). For 2019, the employment rate of higher education graduates between the ages of 25-34 is 81% for women, 89% for men, while the OECD average is 85% in general. The employment rate of women aged 25-34 with higher education in Turkey 62%, the employment rate of men is 83%, and overall this value is 72%. Turkey's employment rate is considerably below the average for OECD countries.

Table C.3.5 shows the employment rates of higher education graduates between the ages of 25-64 in OECD countries according to their education level in 2019. The average of OECD countries regarding the employment rates of higher education graduates between the ages of 25-64 is 86% in total, 82% for associate degree graduates, 84% for undergraduate graduates, 88% for graduate graduates and 93% for doctoral graduates. The employment rate in Turkey for those aged between 25-64 years that have higher education is 65% for those with associate degrees, 75% for those who are university graduates, 84% for master's graduates, 74% in total and 92 % for doctoral graduates. Among the OECD countries, with the exception of Italy, Slovakia, Luxembourg, Austria, Czechia, Denmark, Germany and the Netherlands, employment rates among 25-64 year-olds increase as the education level increases. When we examine the employment rate of those aged between 25-64 years in terms of higher education graduates in Turkey, we can see that the country ranks amongst OECD countries.

Figure C.3.6 shows the unemployment rate of those aged 25-34 that are higher education graduates in OECD countries for 2019. The average unemployment rate of higher education graduates between the ages of 25-34 is 5.4% in OECD countries. The highest unemployment rates for this group are in Greece (19.5%), Turkey (14.9%), Italy (11.9%), Spain (11.8%) and Colombia (11, 7). The countries with the lowest unemployment rates are Czechia (1.4%), Hungary (2.1%), Netherlands (2.2%), New Zealand (2.3%), USA (2.4%), United Kingdom (2.4%), Japan (2.6%), Poland (2.6%), Germany (2.6%), Norway (2.9%) and Australia (2.9%).

Figure C.3.6 Unemployment rates of 25-34 year-olds with vocational upper secondary or post-secondary non-tertiary educational attainment in OECD countries (%) (2019)



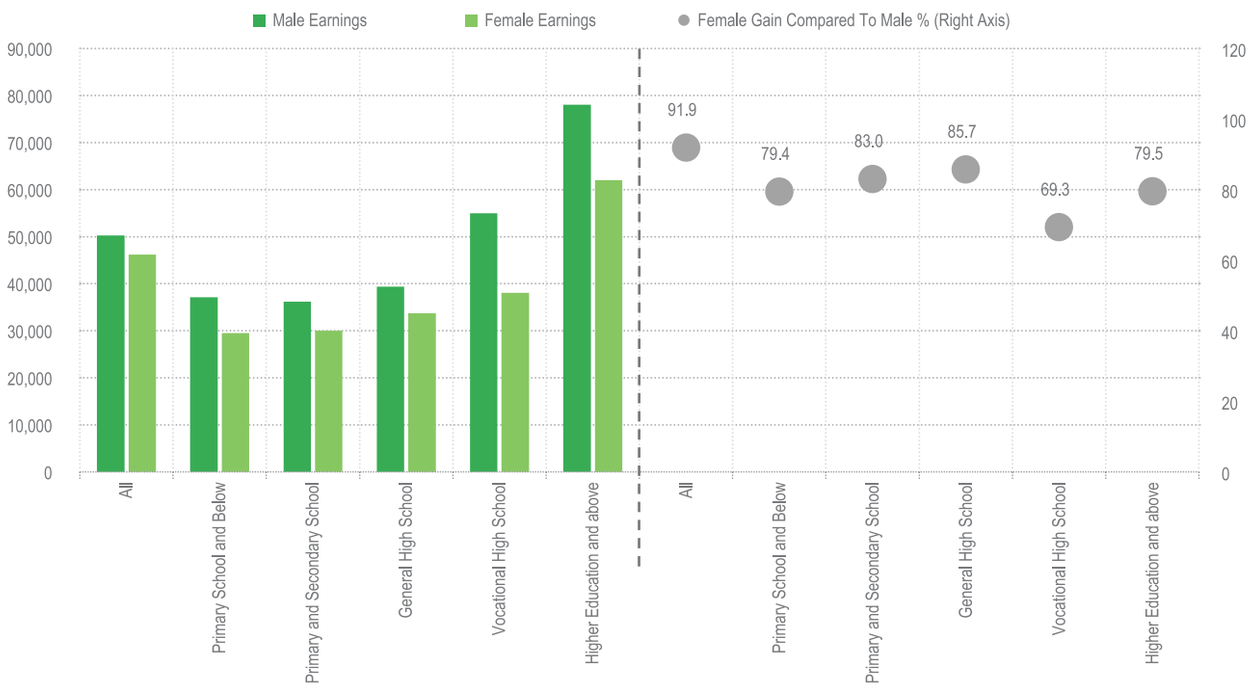
Source: OECD (2020).

INDICATOR C4

HOW MUCH DO HIGHER EDUCATION GRADUATES EARN?

This indicator examines the annual average gross earnings of higher education graduates in Turkey compared to other graduates. Data from the Turkey Statistical Institute (TURSTAT) Wage Structure Survey has been used.

Figure C.4.1 Average annual gross earnings by gender and education level (₺) (2018)

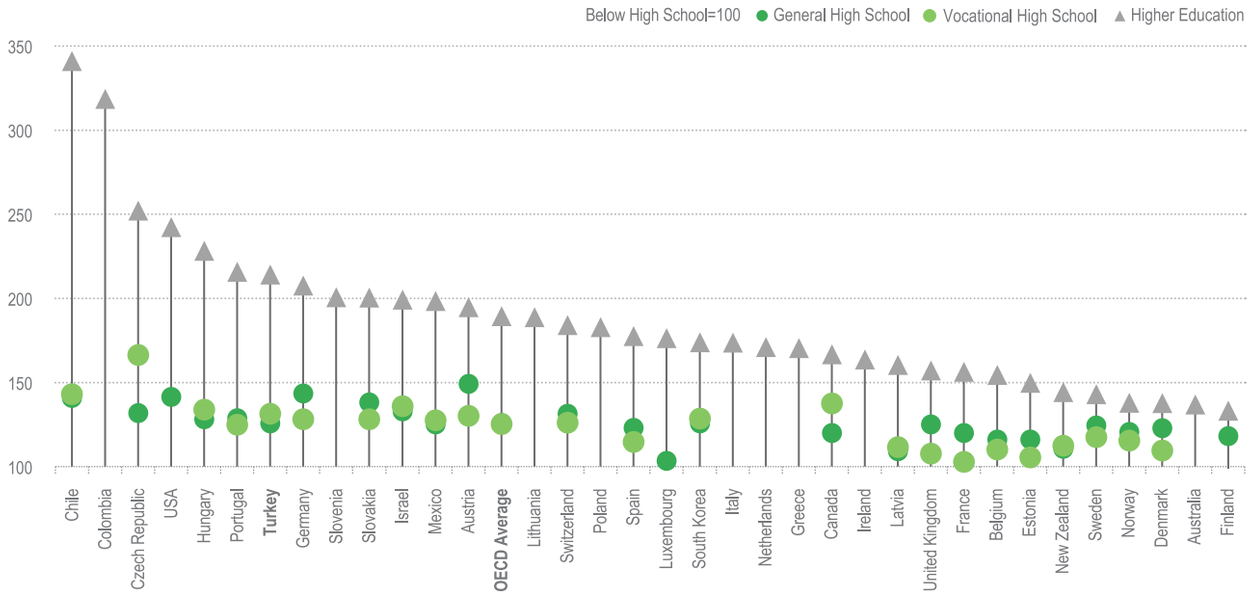


Source: Prepared using TURKSTAT Earnings Structure Survey data.

Figure C.4.1 shows the annual average gross earnings of higher education graduates by gender for 2018. According to the figure prepared by using data from the TurkStat Earnings Structure Survey, as the education level of both women and men increases, their average annual gross earnings increase. While the average annual gross earning of women with higher education is 62,051 TL, the average annual gross earning of men is 78,041 TL, which is above the average annual gross earning for all male and female employees. When the average annual gross earnings of women compared to men are examined, we can see that higher education graduate women earn 79.5% of the annual average gross earning of higher education graduate men. In terms of all employees, women earn 91.9% of the average annual gross earning of men. The average annual gross earnings of male higher education graduates compared to other graduates in terms of all education levels has been considered. There is a difference in earnings in favor of women.

Figure C.4.2 shows the relative earnings of employees by education level in OECD countries for 2018. The earnings of employees with a graduate level of less than high school are fixed to 100, and the earnings of general high school, vocational high school and higher education graduates are arranged according to this data. The OECD average for the relative earning of general high school graduates is 126, the OECD average of the relative earnings of vocational high school graduates is

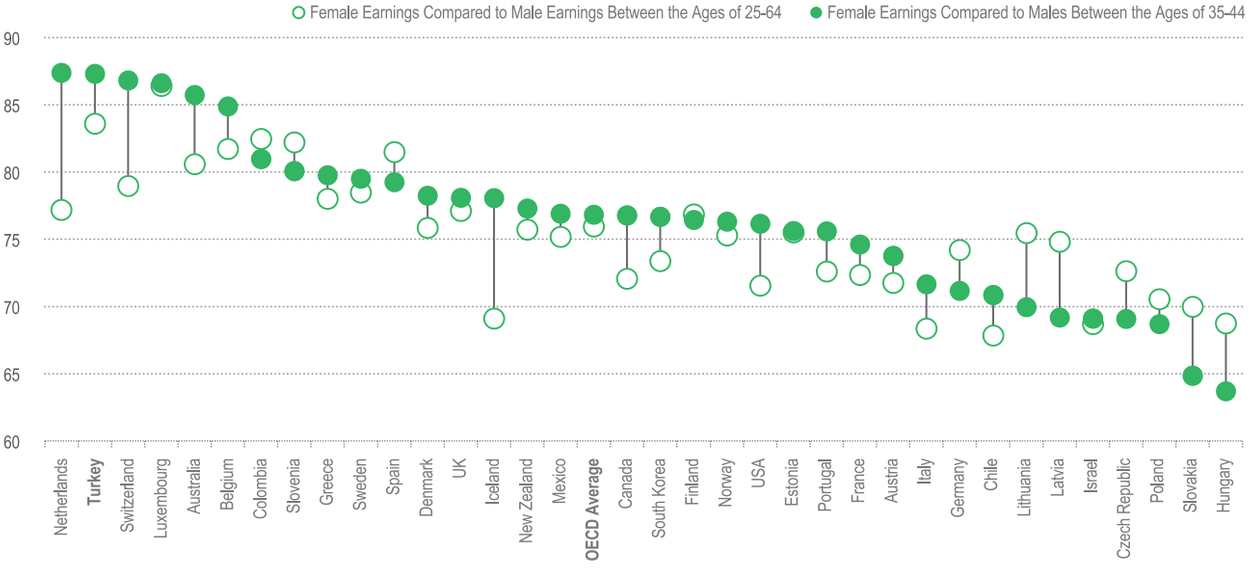
Figure C.4.2 Relative earnings by education level in OECD countries (below high school = 100) (2018)



Source: OECD (2020).

125, and the OECD average of the relative earnings of higher education graduates is 189. In Turkey, compared to high school graduates, the income of general high school graduate employees is (126) and in vocational high schools is (131). In Turkey, graduate employee earnings were similar to the OECD average, while higher education (214) is higher than the OECD average. Compared to high school relative earnings of workers,

Figure C.4.3 Earnings of female higher education graduates compared to males in OECD countries by age group (%) (2018)



Source: OECD (2020).

those with higher education earned the most in Chile (341), Colombia (319), Czech Republic (252), USA (242), Hungary (228), Portugal (216), Turkey (214), Germany (208), Slovenia (201) and Slovakia (200).

In Figure C.4.3, the earnings of female employees with higher education in OECD countries compared to their age groups for 2018 are given. In all OECD countries, the earnings of female higher education graduates between the ages of 25-64 and 35-44, are lower than that of men. Compared to higher education graduates between the ages of 25-64, the average income of women in OECD countries is 76%. This rate is 77% of women compared to men who are higher education graduates between the ages of 35-44.

In terms of employment, we can conclude that the proportion of women with higher education is lower than that of men and that this rate differs between regions. In addition, female higher education graduates have lower annual average gross earnings than men. In recent years, more women have graduated from higher education than men, and the gap is gradually increasing. Women benefit more from higher education opportunities and try to gain more in both the public and private sectors. When compared to OECD countries, Turkey ranks among the highest in terms of the relative earnings of employees with higher education graduates compared to other graduates.

CHAPTER C

CONCLUSIONS AND RECOMMENDATIONS

- In terms of higher education graduate rates, Turkey ranks in the bottom amongst OECD countries. Only for the 25-34 age range is there a 10-point difference between the average rates of higher education graduates in OECD countries and in Turkey. Only taking into consideration this age range and the OECD average, Turkey lacks about 1 million 200 thousand university graduates. When it comes to the proportion of those aged 20-24 that neither work nor are in education, Turkey ranks at the top amongst OECD countries with a rate of 33.3%. Therefore, we can conclude that policies aimed at increasing the proportion of higher education graduates should be developed in Turkey.

- The upward trend in the number of PhD graduates is rather important when we consider Turkey's current needs in terms of PhD lecturers (see. Indicator D.3). There is a need to further increase the number of doctoral graduates.

- Almost a quarter of those who graduated from higher education in recent years are open education graduates. The share of open education in the higher education system should be reduced (see Section B).

- Turkey ranks among the lowest in terms of the unemployment rates of higher education graduates amongst OECD countries. Turkey's employment policies should be revised in order to increase the employment rate of university graduates, thereby reducing the unemployment rate. Effective policies should be developed to reduce youth unemployment and increase their employment. There is no need for Turkey to focus on policies which aim to increase inclusion in higher education for young people on lessening the gaps between regions in terms of higher education.

CHAPTER C

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CHAPTER D

ACADEMIC STAFF

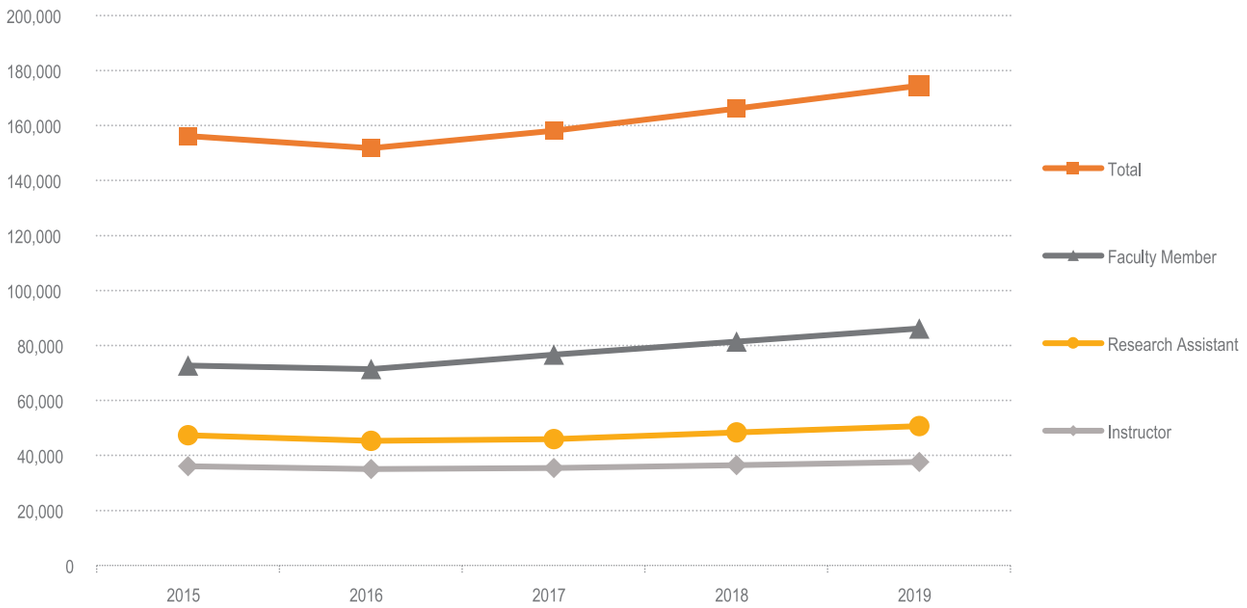
In section will examine academic staff working in higher education institutions in Turkey as well as a number of international staff in terms of academic title and type of higher education institution. Subsequently, the number of scholarship recipients and doctoral students funded by the Ministry of National Education (MEB) to study abroad will be examined.

INDICATOR D1

WHAT IS THE NUMBER OF ACADEMIC STAFF IN TURKEY?

This indicator will examine teaching staff working in higher education institutions in Turkey in terms of type of higher education institutions and academic time. National data has been presented alongside data from Organization for Economic Co-operation and Development (OECD) countries.

Figure D.1.1 Trends in the number of academic staff (2015-2019)

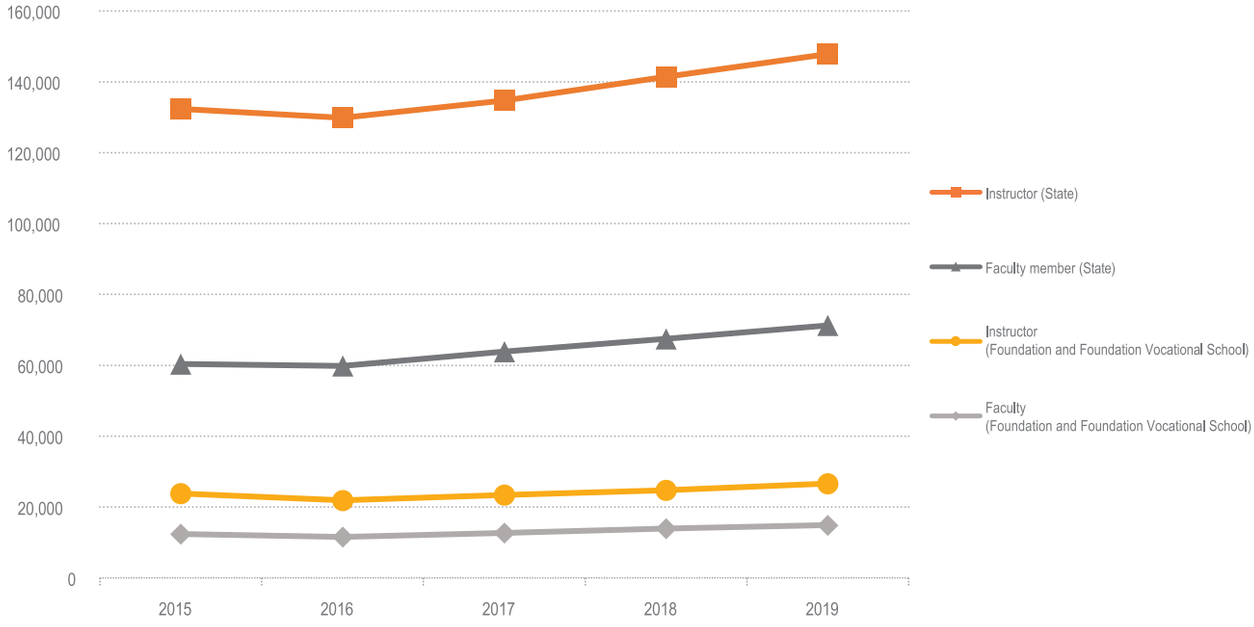


Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

The change in the number of teaching staff between 2015 and 2019 is shown in Figure D.1.1. During these years, the number of research assistants increased from 47 thousand to 51 thousand, the number of lecturers from 36 thousand to 38 thousand, and the number of lecturers (assistant professors, associate professors and professors) from 73 thousand to 86 thousand. The increase in the number of research assistants and lecturers is lower than the increase in the number of faculty members. Considering Turkey's current needs in terms of faculty members and research assistants, there should be special attention paid to this point.

The change in the number of faculty members and staff between 2015 and 2019 according to the type of higher education institution is given in Figure D.1.2. The total number of lecturers in state universities increased from 60 thousand to 71 thousand, and the total number of lecturers in foundation higher education institutions from 132 thousand to 148 thousand, and the total number of faculty members increased from 12 thousand to 15 thousand. The total number of academic staff went from 24 thousand to 27 thousand. While the increase in academic staff in foundation higher education institutions was around 20% in the five-year period, the increase in faculty members in state higher education institutions was around 18%.

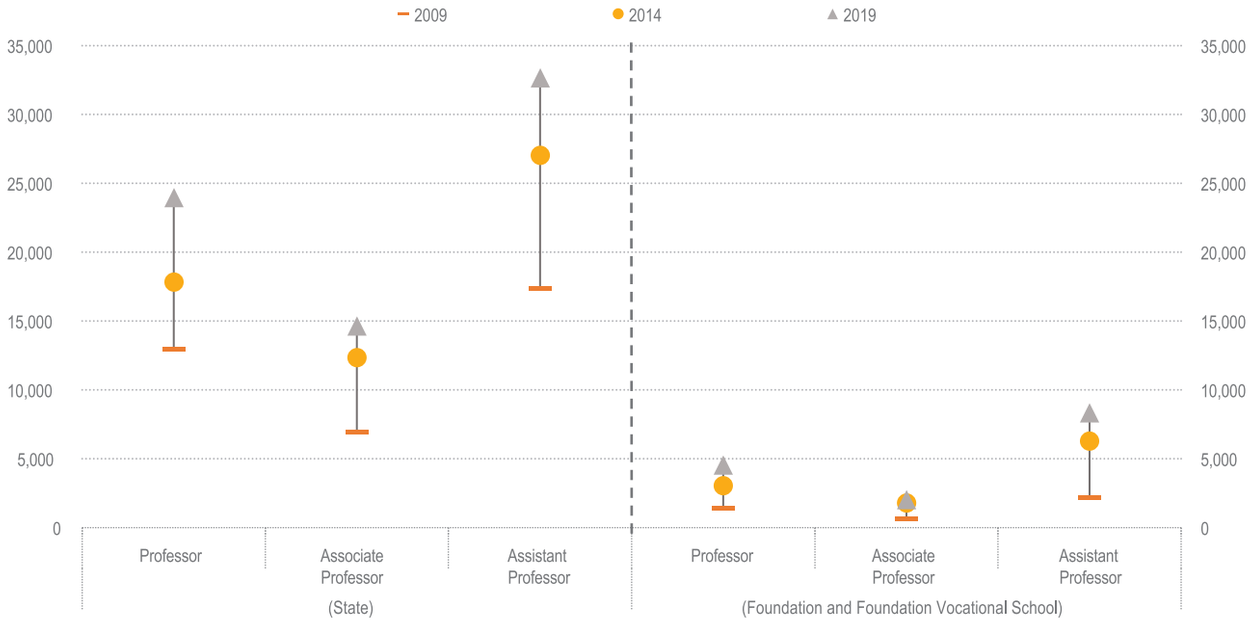
Figure D.1.2 Trends in the number of faculty members and academic staff according to the type of higher education institution (2015-2019)



Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

The change in the number of faculty members for 2009, 2014 and 2019 according to the type of higher education institution and academic title is shown in Figure D.1.3. There is a general growth trend in both state and foundation higher education institutions. However, when we consider all academic titles, the

Figure D.1.3 Change in the number of faculty members according to higher education institution type and academic title (2009, 2014 and 2019)

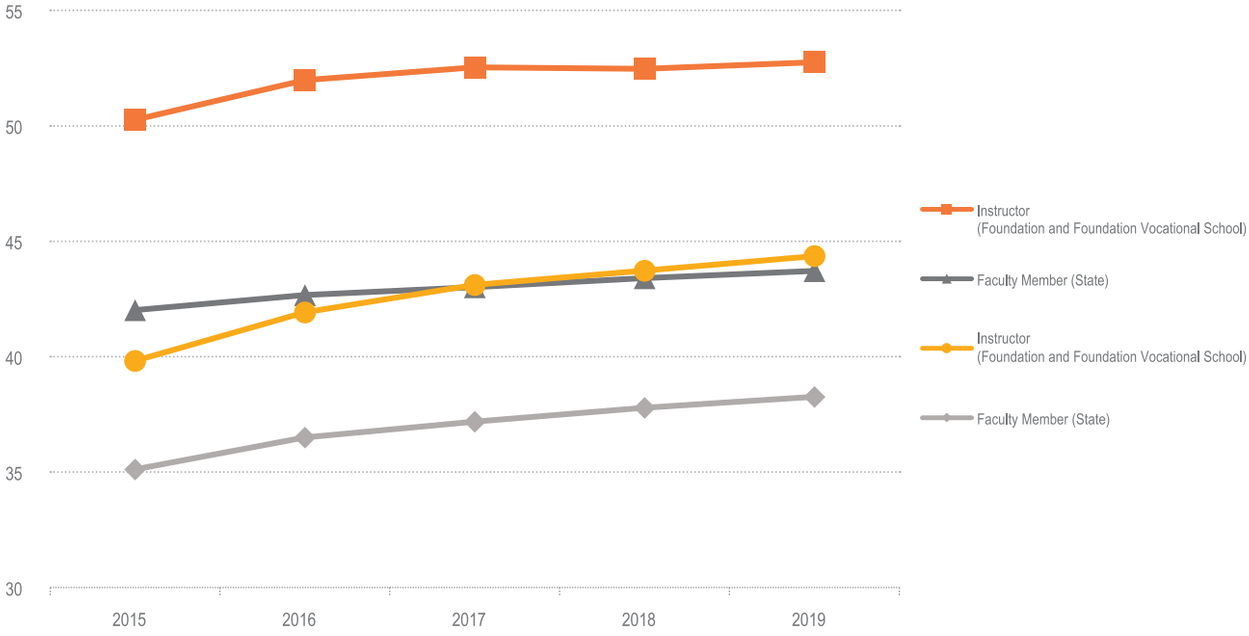


Source: Prepared using the Higher Education Information Management System and ÖSYM data.

growth between 2014-2019 is smaller than the growth between 2009-2014. This situation indicates that the growth momentum in higher education has decreased in terms of the number of faculty members.

The change in the ratio of female academic staff and lecturers among all academic staff according to the type of higher education institution between 2015 and 2019 is shown in Figure D.1.4. In general, an increase in the ratio of female academic staff and teaching staff draws attention. There is a 4-point increase in the ratio of female faculty members in foundation higher education institutions and a 3-point increase in the ratio of faculty members in state higher education institutions. As of 2019, the rate of female faculty members in state higher education institutions (38%) is lower than the rate of

Figure D.1.4 Trends in the ratio of female academic staff and faculty among academic staff and faculty working by higher education institution type (%) (2015-2019)

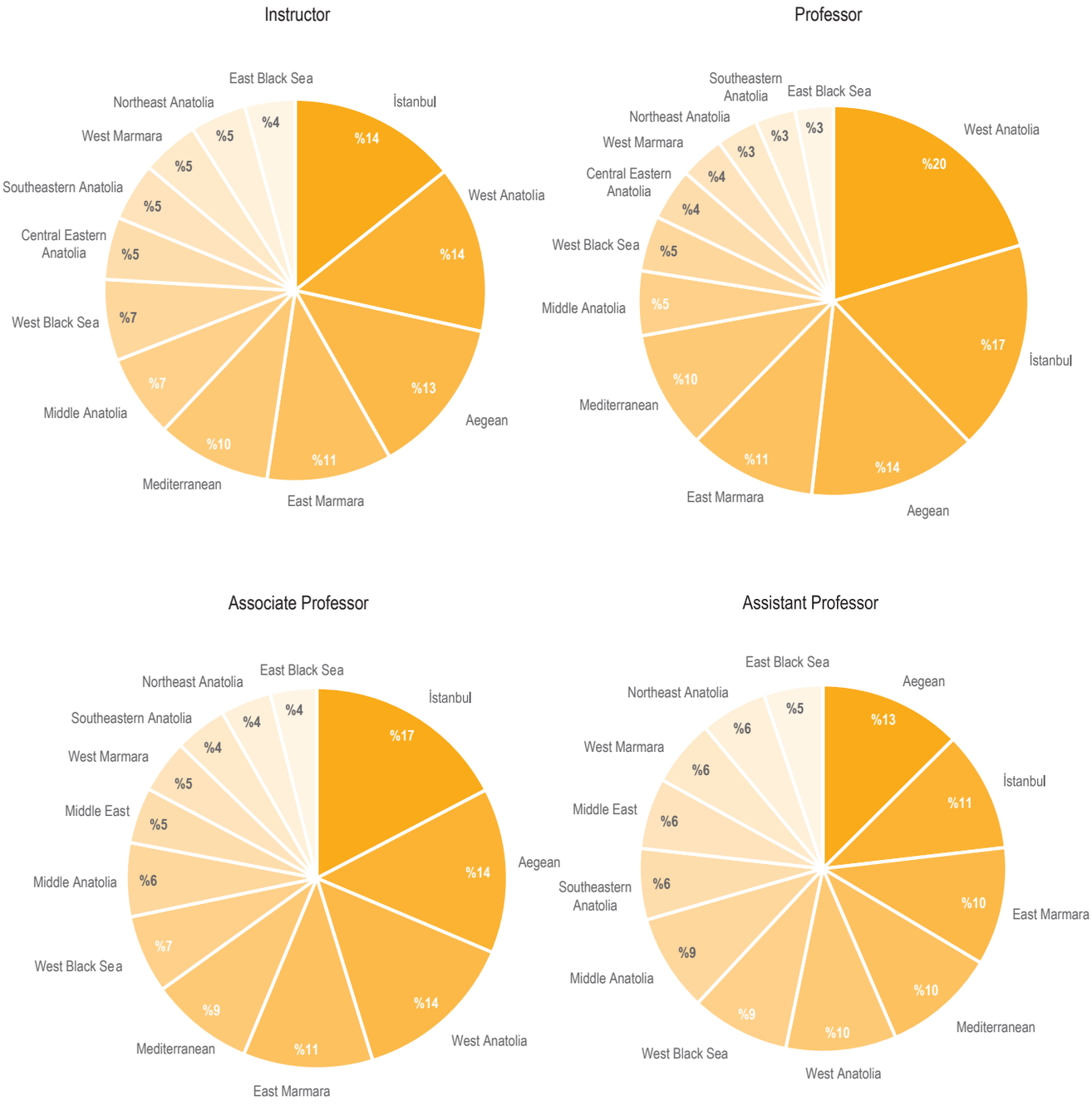


Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

female faculty members in foundation higher education institutions (44%).

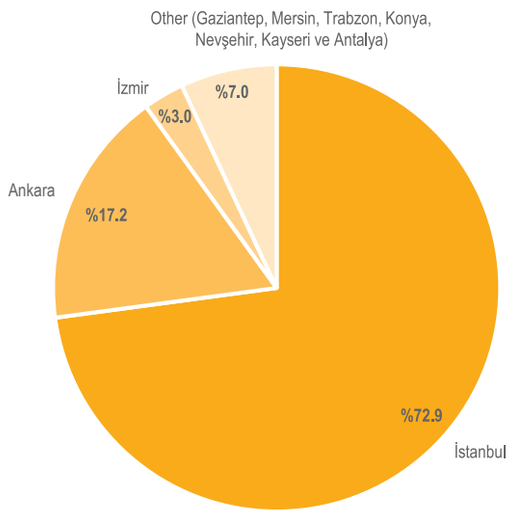
The proportional distribution of faculty members working in state higher education institutions for 2019 by region is shown in Figure D.1.5. Considering the distribution of professors, associate professors, doctoral lecturers and total faculty members by regions, a significant differentiation is observed between regions. There is an increase in the ratio of lecturers and academic staff in provinces such as Istanbul and Ankara and these regions seem advantageous in terms of associate professor and professor rates. We can see that there is a 4-point increase in the ratio of female faculty members in foundation higher education institutions and a 3-point increase in the ratio of faculty members in state higher education institutions. As of 2019, the rate of female faculty members in state higher education institutions (38%) is lower than the rate of female academic staff in foundation higher education institutions (44%). The distribution of faculty members does not represent the population distribution of Turkey. For example, 9% of Turkey's population lives in the Southeastern Anatolia Region, while only 5% of the faculty member live in the same area.

Figure D.1.5 Proportional distribution of faculty members working in state higher education institutions by region (%) (2019)



Source: Prepared using Higher Education Information Management System data.

Figure D.1.6 Proportional distribution of faculty members working in foundation higher education institutions by region (%) (2019)

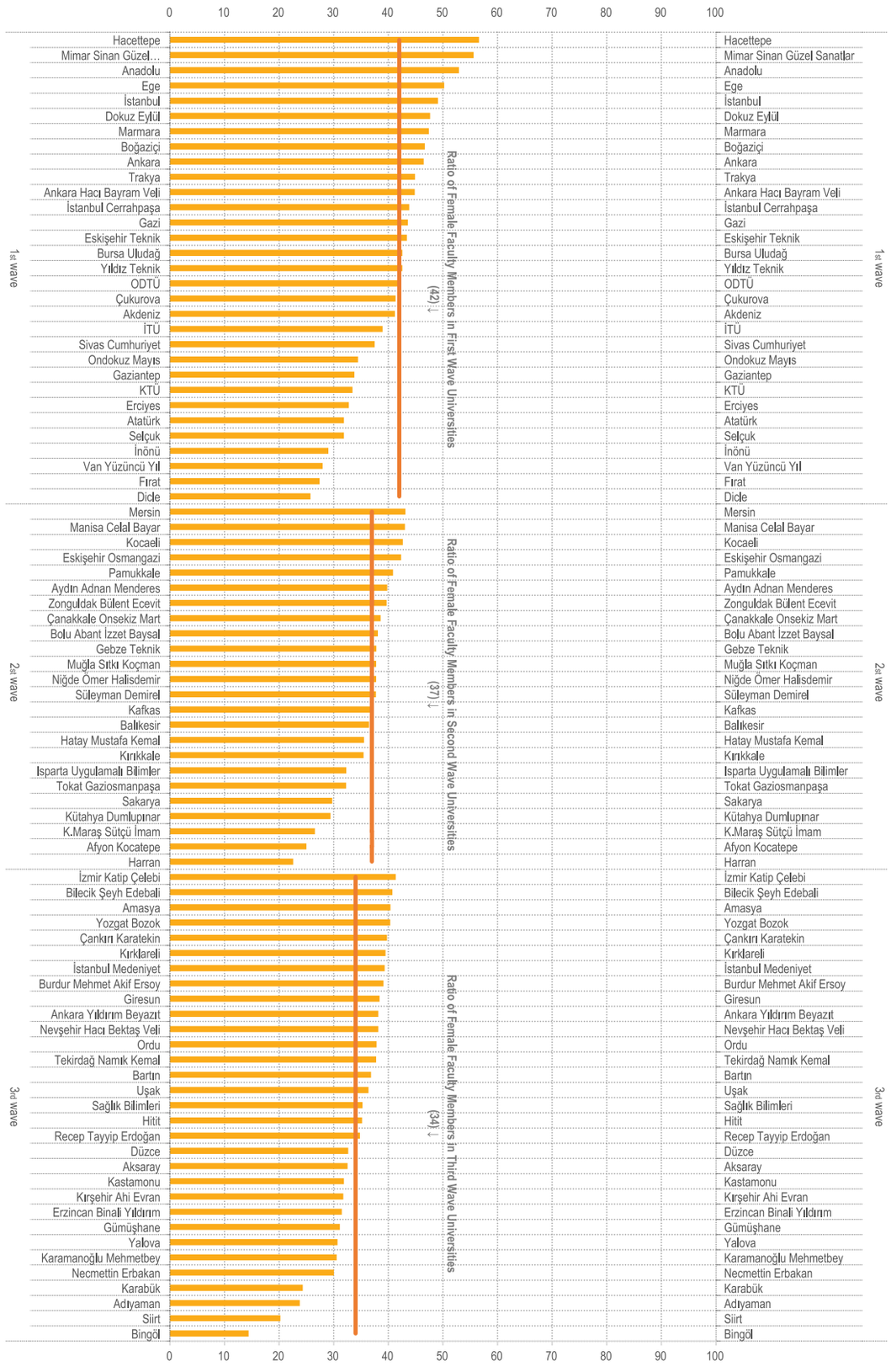


Source: Prepared using Higher Education Information Management System data.

The proportional distribution of faculty members working in foundation higher education institutions for 2019 by region is given in Figure D.1.6. 72.9% of faculty members in foundation higher education institutions work in Istanbul, 17.2% in Ankara, 3% in Izmir and the remaining 7% in seven other provinces. As can be seen from the figure, more than 90% of the faculty members in foundation higher education institutions are gathered in only two metropolitan cities.

The rates of female faculty members in first, second, and third wave state higher education institutions for 2019 are given in Figure D.1.7. In general, two points can be made by looking at the figure. Firstly, there is an important differentiation within each wave between the rates of female faculty members in higher education institutions established in relatively recent years. Secondly, first wave state higher education institutions have a higher proportion of female faculty members than second wave state higher education institutions, while second wave state higher education institutions have a higher proportion of female faculty members than third wave state higher education institutions. The reason for this situation is that the third wave state higher education institutions were established in relatively less developed provinces compared to the second wave state higher education institutions, and the second wave state higher education institutions compared to the first wave state higher education institutions.

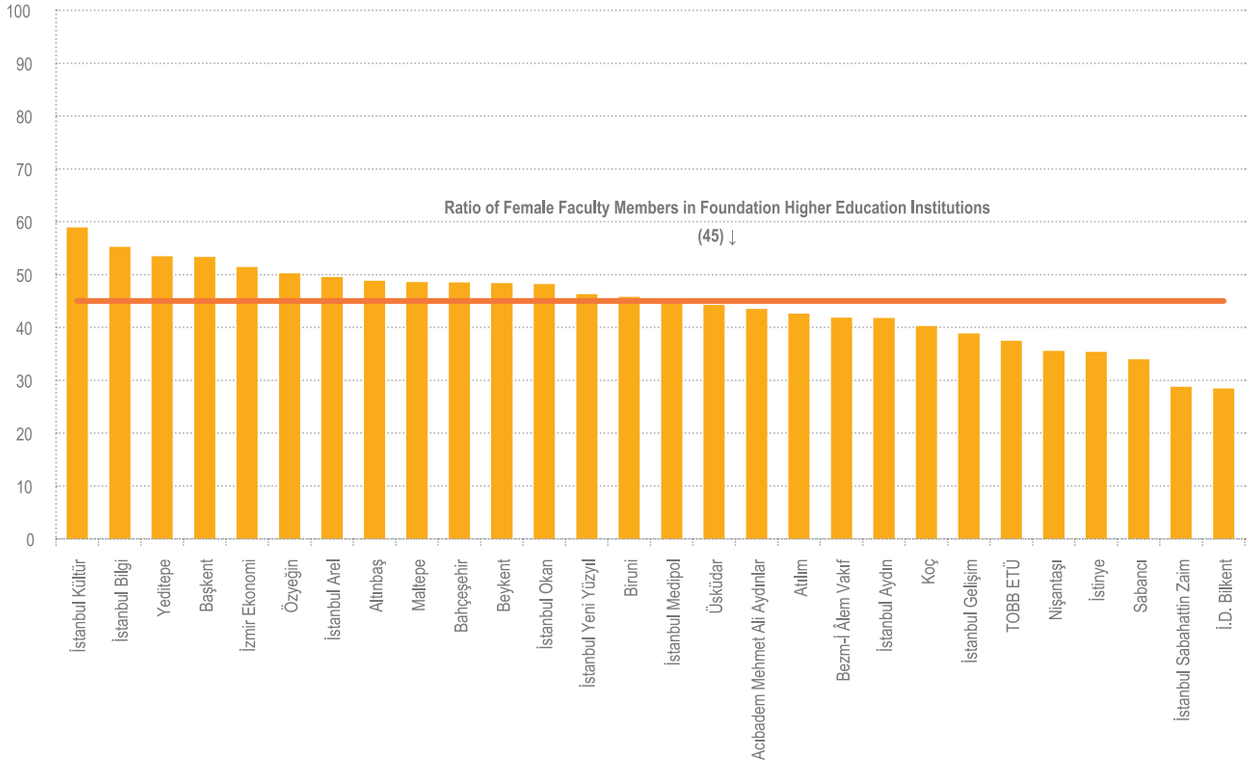
Figure D.1.7 Ratios of female faculty members in first, second and third wave state higher education institutions (2019)



Source: Prepared using Higher Education Information Management System data.

Note: The figure shows those who have 250 or more faculty members in state higher education institutions.

Figure D.1.8 Ratio of female faculty members in foundation higher education institutions (2019)



Source: Prepared using Higher Education Information Management System data.
Note: The figure shows those who have 200 or more faculty members in foundation higher education institutions.

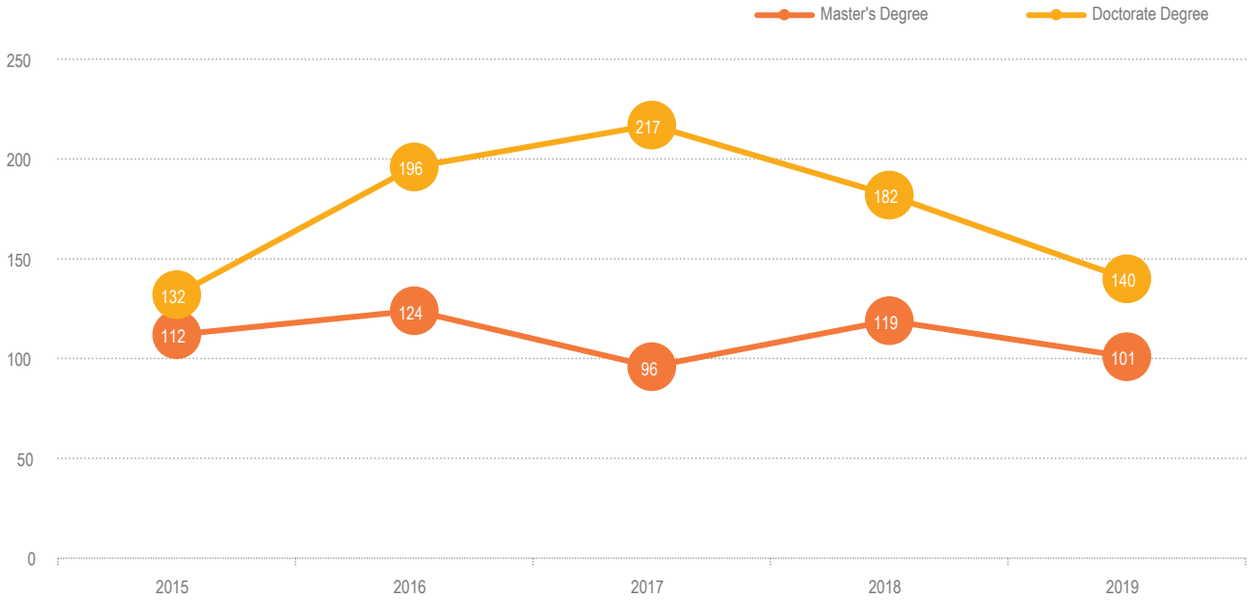
The rates of female faculty members in foundation higher education institutions according to 2019 are given in Figure D.1.8. The ratio of female faculty members in foundation higher education institutions is higher than the same rate in first, second and third state higher education institutions (see Figure D.1.7). However, there is a great differentiation among foundation higher education institutions. For example, the first foundation higher education institution, I.D. Bilkent University has a female faculty member rate of 28%. This same rate is 59% at Istanbul Kültür University. Since more than 90% of foundation higher education institutions are located in Istanbul and Ankara, the difference between gender rates is more likely to be related to the working conditions and wage policies of the institutions rather than geographical factors.

INDICATOR D2

HOW MANY PEOPLE HAVE COMPLETED HIGHER EDUCATION ABROAD THROUGH MEB SCHOLARSHIPS AND RETURNED TO SERVICE?

The doctorate-holding academic staff shortage of Turkey's higher education system emerges as a chronic problem (Çetinsaya 2014; Erdoğmuş, 2019; Gur et al., 2019; Ozer, 2011; YÖK, 2007). The Higher Education Council (YÖK) and the Ministry of National Education (MEB) are implementing various programs to fill the faculty shortage in higher education institutions. In this section, only data from the Ministry of Education regarding students sent abroad was analyzed, as data requested from YÖK within the scope of 100 \ 2000 YÖK Doctorate Scholarships could not be obtained. This indicator will examine the number of candidates sent abroad for Graduate Education (YLSY) in accordance with the Law No. 1416 on Requests to be Sent to Foreign Countries. The number of candidates who completed their graduate education abroad and started their compulsory service were examined in addition to the number of scholars currently studying.

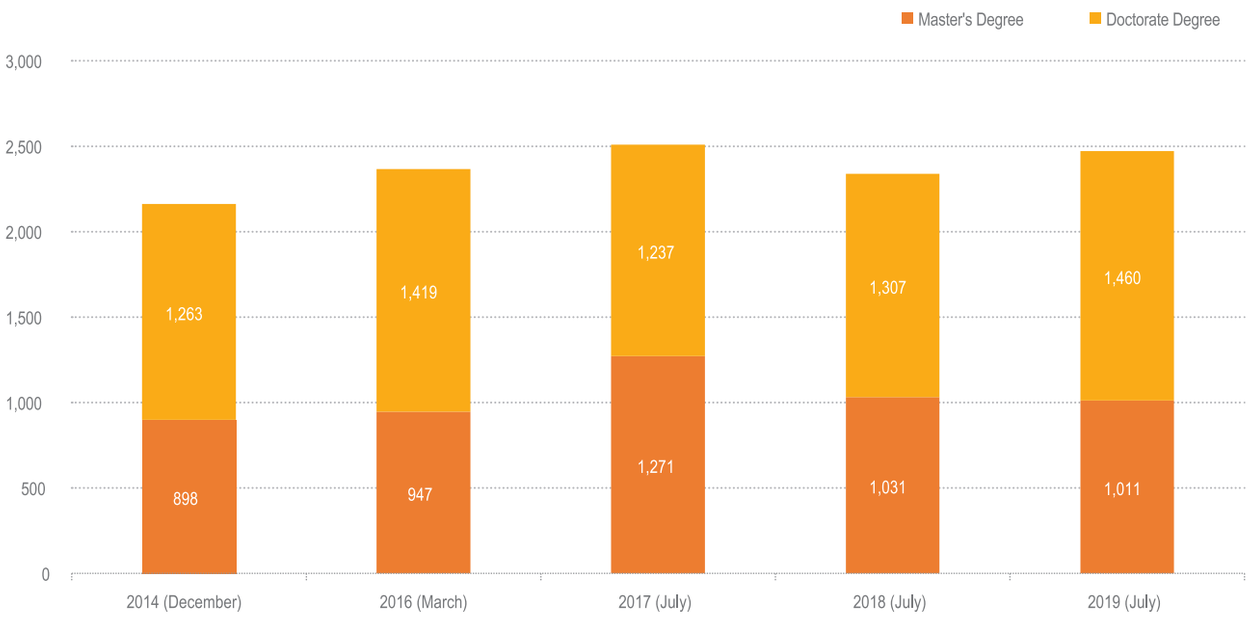
Figure D.2.1 The number of those who completed their education within the scope of YLSY, requested a task and started compulsory service, by education level (2015-2019)



Source: Prepared using data from MEB the Outlook on Higher Education in Turkey 2019 Report.

The number of those who completed their education within the scope of YLSY between 2015 and 2019 and started their compulsory service according to their education level is shown in Figure D.2.1. The figure shows the number of candidates sent abroad for Graduate Education (YLSY) in accordance with the Law No. 1416 on Requests to be Sent to Foreign Countries. We can see that 95-125 people graduate annually at the master's level and 130-220 people graduate annually at the doctoral level.

Figure D.2.2 Number of scholars studying abroad within the scope of YLSY, by level of education (2014-2019)



Source: Prepared using data from MEB the Outlook on Higher Education in Turkey 2019 Report.

The number of scholars who studied abroad within the scope of YLSY between the years of 2014-2019 is given in Figure D.2.2. As can be seen from this data, there is a slight increase in the number of graduate and doctoral students.

INDICATOR D3

HOW MUCH IS THE ACADEMIC STAFF AND LECTURER SHORTAGE IN TURKEY?

This indicator examines faculty and staff in Turkey using the average of OECD countries in order to conduct a scenario study. While conducting this scenario study, the most up-to-date (2018) data from OECD countries was taken as basis. The number of students per academic staff is 15 according to the average of OECD countries. The same number is 25 students per instructor in Turkey (OECD, 2020). Research assistants are accepted as teaching assistants by the OECD and are not included in the calculations. In order to be consistent with OECD calculations, only faculty members and lecturers were taken into account in the faculty category. All calculations were made on the basis of face-to-face student numbers.

Table D.3.1 Scenario comparing the average number of students per instructor in Turkey and in OECD countries

Number of Instructors		Turkey Instructor Deficit		
Turkey (2019)	According to the OECD (2018) Average	Instructor	Faculty Member	Total
123,827	206,378	24,765	57,786	82,551

Note: Only face-to-face student numbers are used in the calculations.

Figure D.3.1. shows a scenario in which Turkey is equal to the OECD average in term of average instructor per student. In order for the number of students per instructor in Turkey to reach the OECD average, an additional 83 thousand instructors need to be employed. Assuming that 70% of this is academic staff, there is a shortage of 58 thousand faculty members. Likewise, assuming that the remaining 30% are lecturers, there is a faculty shortage of 25 thousand (OECD, 2020). In sum, considering the total number of face-to-face students in Turkey, the total number of faculty members must be increased from 124 thousand to 206 thousand in order to reach the OECD average of faculty members per student. It should be added that when only 2 million of the current open education students are accepted as active enrolled students and included in this calculation, the current staff deficit of 83 thousand will increase to 185 thousand.

CHAPTER D

CONCLUSIONS AND RECOMMENDATIONS

- Considering the number of face-to-face students in Turkey, the total number of academic staff must be increased from 124 thousand to 206 thousand in order to reach the OECD average. In other words, Turkey has a total of 83 thousand open higher education academic staff positions, 58 thousand of whom are PhD staff positions. The number of students per instructor is perhaps the most important indicator of the quality of higher education. Therefore, the number of academic staff in Turkey must be increased. Existing national and international programs are not sufficient to meet these needs and increase the number of doctoral faculty members. Within the scope of the YLYS program, we can see that 95-125 people graduate annually at the master's level and 130-220 people graduate at the doctoral level. Still, even if we assume that all doctoral level students who completed the full training and started working in a higher education institution, this increase in the number of faculty is insufficient. Therefore, the capacities of national and international programs supporting postgraduate education should be expanded.

- Even if we assume that Turkey will have 7500-9500 doctoral graduates in the next year, it will still take at least six or seven years for the country to fill its shortage of 58 thousand academic staff. Moreover, this scenario is not realistic when Turkey's young population and access to higher education is taken into account. Therefore, in order to increase the quality of education and research in higher education, a serious improvement is required in the number of doctoral graduates per year. In order to achieve this, the efficiency and capacity of YÖK doctoral scholarships should be increased.

- The postgraduate education of teacher candidates, known as "unassigned teachers," by the public, should be supported and their work in higher education institutions should be encouraged in order to decrease the shortage of 25 thousand academic staff. Thus, both the employment of university graduates awaiting appointment will be provided and the need for lecturers of higher education institutions will be met.

- Planning and coordination studies should be carried out to ensure a balanced distribution of faculty members across the country and to reduce the differentiation of the number of students per faculty member among universities.

CHAPTER D

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CHAPTER E

EDUCATIONAL ENVIRONMENTS

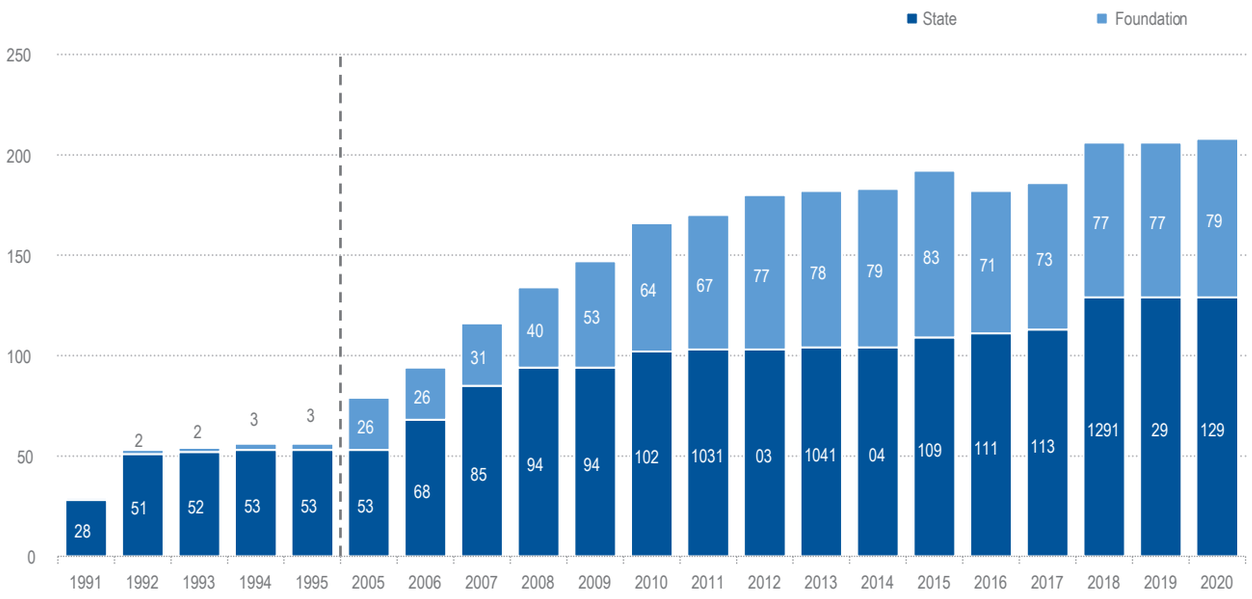
In this section, up-to-date data on educational environments will be discussed. For this purpose, the number of higher education institutions and divisions in Turkey, the number of students and faculty members per university, the number of students per instructor / faculty member, the numbers and capacities of the Credit and Hostels Institution (KYK) dormitories will be examined. The indicators in this section have not taken into consideration the number of open education students.

INDICATOR E1

WHAT IS THE NUMBER OF HIGHER EDUCAITON INSTITUIONS IN TURKEY?

This indicator examines the number of state and foundation higher education institutions according to years and provinces, the number of state universities according to the establishment waves, and the number of existing departments in these institutions.

Figure E.1.1 Trends in the number of higher education institutions by years (1991-2020)

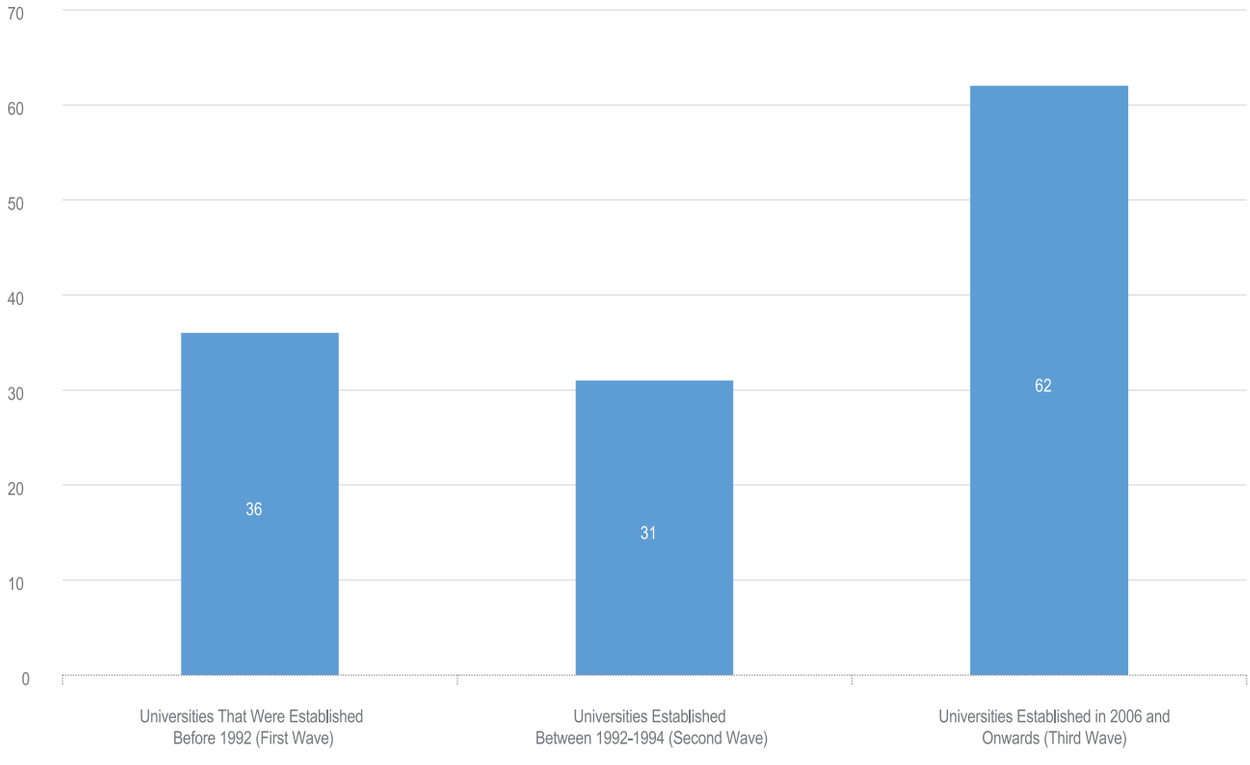


Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

Figure E.1.1 shows the change in the number of higher education institutions between 1991 and 2020. The data for the years in the figure refer to the number of universities established in that year. The number of state higher education institutions, which was 28 in 1991, increased to 51 in 1992 and remained the same until 2005. The number of state higher education institutions established in 2006 and after has increased rapidly over the years and reached 129 in 2020. The number of foundation higher education institutions, which was 3 in 1995, increased to 26 in 2005 and reached 79 in 2020. As of 2020 ,there are a total of 208 higher education institutions in Turkey including 129 state universities and 79 private higher education institutions.

The number of state universities in Turkey as of 2020 is shown in Figure E.1.2 according to the wave they were established in. State universities have been established in three different waves until 2018 (Gur et al., 2018). In 2018, a total of 16 new state universities were established with the division of 14 universities with a high number of students and the establishment of 2 new universities. In the Outlook on Education in Turkey 2019 report, these universities are expressed and included as divided universities in the indicators. Since almost all of the divided universities have students, lecturers and educational environments, and education and training continues, they have been categorized into whichever wave the original university was categorized into. Although the higher education institutions appears

Figure E.1.2 State universities in Turkey according to wave of establishment (2020)



Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

to have been formally newly established as a result of the division, it is because they have a substantial past. An example of this is the case of Istanbul University-Cerrahpaşa. In summary, there is a difference between higher education institutions established as a result of the division. The number of universities established and divided in the first wave (before 1992) was 36, in the second wave (between 1992-2005) 31, and in the third wave (2006 and after) 62. Therefore, 8 of these 16 newly established universities took part in the first wave, 6 in the second wave and 2 in the third wave.

Table E.1.3 shows the number of higher education institutions by provinces. Istanbul is the city that hosts the highest number of higher education institutions, 13 of which are state and 49 of which are foundation higher education institutions. The second province with the highest number of higher education institutions is Ankara with 14 foundation higher education institutions and 8 state universities. There are 4 foundation institutions and 6 state institutions in İzmir, 3 foundation institutions and 2 state institutions in Antalya, 2 foundation institutions and 3 state institutions in Konya, 2 foundation institutions and 2 state institutions each in Gaziantep and Mersin, 1 foundation institution and 3 state institutions in Kayseri, 1 foundation institution and 2 state institutions each in Kocaeli and Trabzon, 2 state institutions in Bursa, 3 state institutions in Eskişehir, and 1 foundation institution and 1 state institution in Nevşehir. There are 2 state institutions each in Adana, Afyon, Balıkesir, Erzurum, Hatay, Isparta, Maraş, Kütahya, Malatya, Sakarya, Samsun and Sivas, and 1 state institution in remaining provinces.

Table E.1.3 Number of higher education institutions by province (2020)

Province	State	Foundation and Foundation Vocational School	Total
İstanbul	13	49	62
Ankara	8	14	22
İzmir	6	4	10
Antalya	2	3	5
Konya	3	2	5
Gaziantep, Mersin	2	2	4
Kayseri	3	1	4
Kocaeli, Trabzon	2	1	3
Bursa	2	-	2
Eskişehir	3	-	3
Nevşehir	1	1	2
Adana, Afyonkarahisar, Balıkesir, Erzurum, Hatay, Isparta, Kahramanmaraş, Kütahya, Malatya, Sakarya, Samsun, Sivas	2	-	2
Adıyaman, Ağrı, Aksaray, Amasya, Ardahan, Artvin, Aydın, Bartın, Batman, Bayburt, Bilecik, Bingöl, Bitlis, Bolu, Burdur, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Düzce, Edirne, Elazığ, Erzincan, Giresun, Gümüşhane, Hakkâri, Iğdır, Karabük, Karaman, Kars, Kastamonu, Kırıkkale, Kırklareli, Kırşehir, Kilis, Manisa, Mardin, Muğla, Muş, Niğde, Ordu, Osmaniye, Rize, Siirt, Sinop, Şanlıurfa, Şırnak, Tekirdağ, Tokat, Tunceli, Uşak, Van, Yalova, Yozgat, Zonguldak	1	-	1

Source: Prepared using Higher Education Information Management System data.

In Table E.1.4, the unit numbers according to the type of higher education institution are shown as of May 2020. There are 4 foundation vocational higher education institutions which have 224 programs, 69 departments and a research and application center. Foundation higher education institutions have 471 faculties, 107 colleges, 108 vocational schools, 179 institutes, 3.334 departments, 9.436 programs (programs with 25%

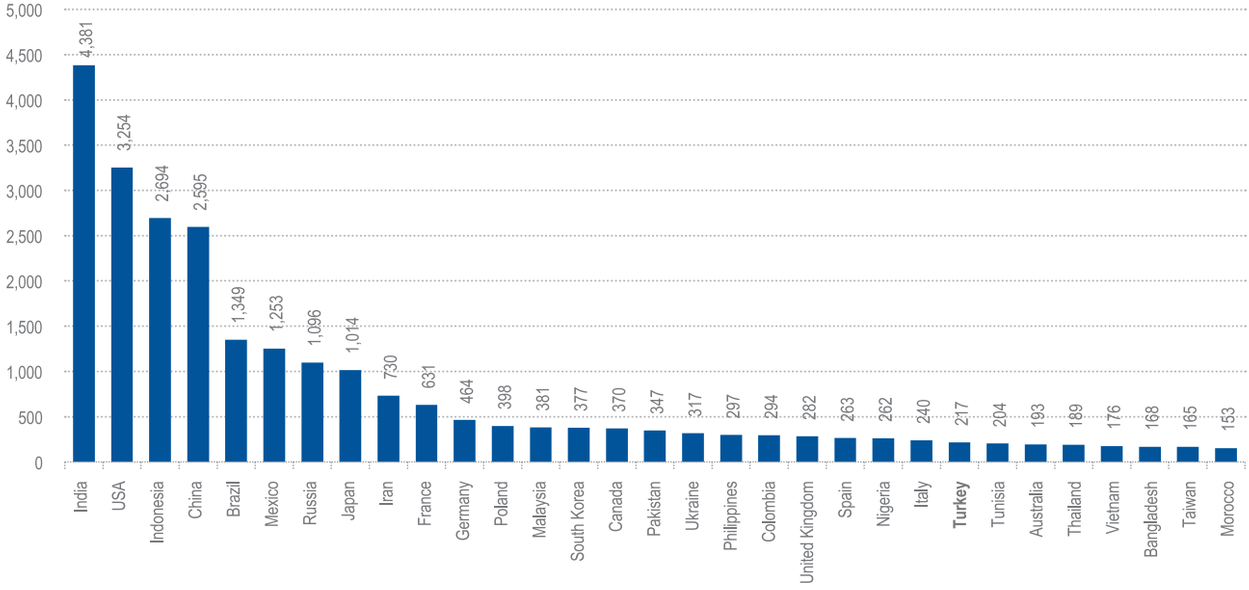
Table E.1.4 Number of units by type of higher education institution (2020)

Type	State	Foundation	Foundation Vocational School	Total
University	129	75	4	208
Faculty	1,423	471	0	1,894
College	309	107	0	416
MYO	908	108	4	1,020
Institute	468	179	0	647
Research and Application Center	2,974	711	1	3,686
Department	15,407	3,334	69	18,810
Program	15,541	9,436	224	25,201
Branch	29,315	2,818	0	32,133
Branch of Science	7,340	604	0	7,944
Master's Program	10,261	2,482	0	12,743
Doctorate Program	4,935	523	0	5,458
Proficiency Program in The Arts	127	15	0	142

Source: Prepared using Higher Education Information Management System data (May 2020).

scholarship, 50% scholarship etc. are classified as separate programs), and 711 research and application centers. In addition, there are 2,482 master's programs and 523 doctoral programs at foundation universities. State higher education institutions have 1,423 faculties, 309 colleges, 908 vocational schools, 468 institutes, 2,974 research and application centers, 15,407 departments and 15,541 programs. There are 10,261 master's programs and 4,935 doctoral programs in state higher education institutions.

Figure E.1.5 Number of universities according to countries with more than 150 higher education institutions in the world (July 2020)



Source: WEBOMETRICS (2020).

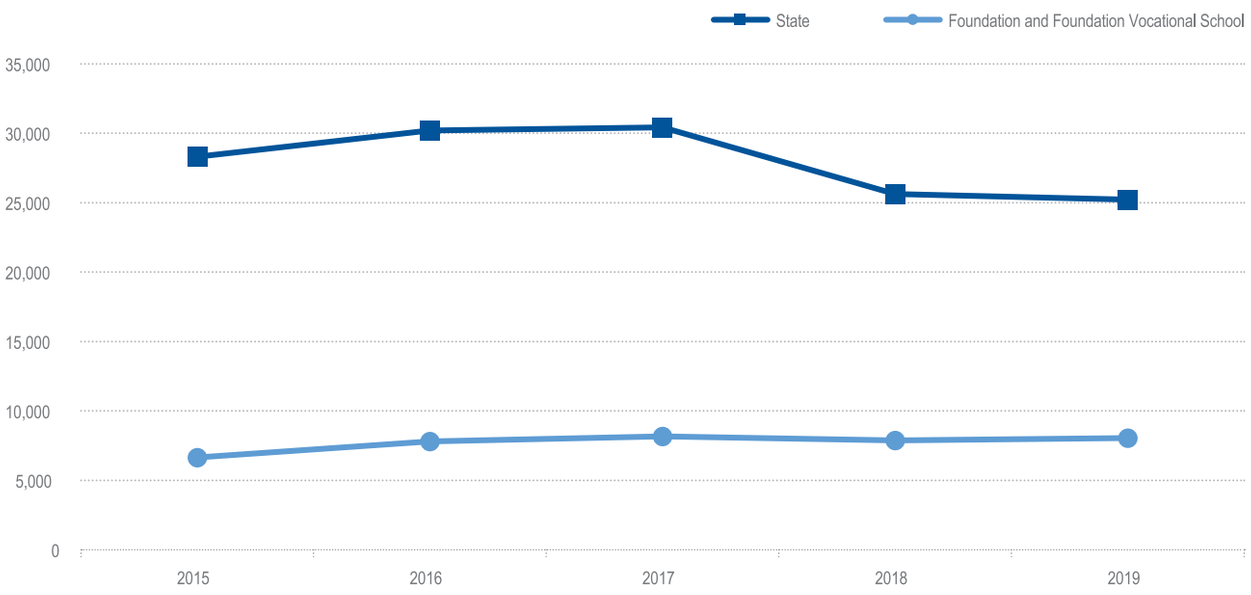
Note: Only data for countries with more than 150 higher education institutions has been taken into account.

Figure E.1.5 shows the number of universities of countries with more than 150 higher education institutions as of July 2020. A portion of Turkey's data comes from universities in Cyprus. India is the country with the highest number of universities in the world with 4,381 universities. The USA ranks second with 3,254 universities. The next countries in order are Indonesia (2,694), China (2,595), Brazil (1,394), Mexico (1,253), Russia (1,096). Japan (1.014) has over a thousand universities. Turkey ranks 24th in the number of universities at 217. In comparison, countries with a population similar to that of Turkey have the following number of universities: 730 in Iran, 464 in Germany and 631 in France. This data indicates that the existing number of universities in Turkey is insufficient when compared to other countries.

INDICATOR E2 WHAT IS THE NUMBER OF STUDENTS AND FACULTY PER INSTITUTION?

This indicator examines the number of students and faculty members per institution in state and foundation higher education institutions. The data used under this indicator allows for a preliminary assessment of the average size and capacity of higher education institutions.

Figure E.2.1 Trends in the average number of students per state and foundation higher education institutions (2015-2019)



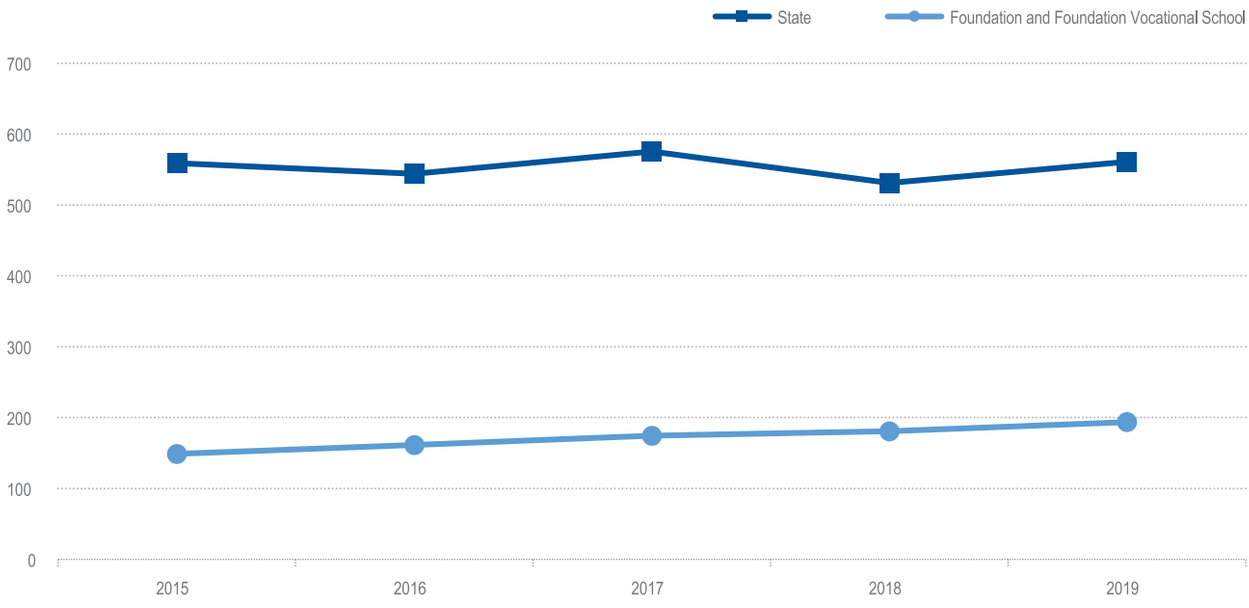
Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

Figure E.2.1 shows the change in the average number of students per state and foundation higher education institutions between 2015 and 2019. In 2015, the number of students per higher education institution was 28.300 in state higher education institutions and 6.650 in foundation higher education institutions. The number of students per institution in state higher education institutions decreased to 25.200 in 2019, and the number of students per institution in foundation higher education institutions increased to 8,050. The number of students appears to have a heterogeneous structure in terms of state higher education institutions. Turkey has 18 state higher education institutions which have over 50 thousand and under 15 thousand students. (see Indicator B).

Figure E.2.2 shows the change in the number of faculty members per state and foundation higher education institutions between 2015 and 2019. The number of faculty members per institution in state higher education institutions increased from 559 to 561 between 2015 and 2019, and the number of faculty members per institution in foundation higher education institutions increased from 149 to 194.

Figure E.2.3 shows the number of faculty members and students per state higher education institution according to the establishment waves for 2019. The number of faculty members per state higher education institutions is 963 in the first wave, 556 in the second wave and 322 in the third wave. The number of students

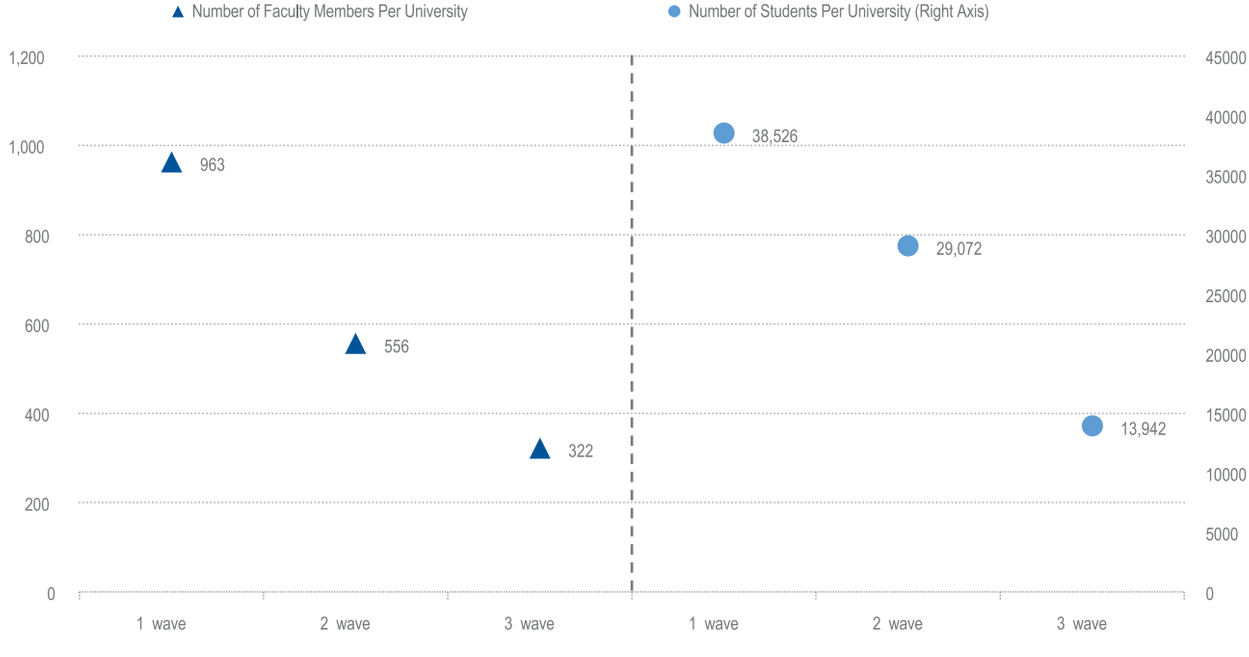
Figure E.2.2 Trends in the number of faculty members per state and foundation higher education institutions (2015-2019)



Source: Prepared using data from the Higher Education Information Management System data and the Outlook on Higher Education in Turkey 2019 Report.

per state higher education institutions is 38,526 in universities in the first wave, 29,072 in universities in the second wave, and 13,942 in universities in the third wave. As we have emphasized before, there is an unbalanced distribution in terms of the number of students and faculty members both among different waves and among universities established in the same wave (see Indicator D).

Figure E.2.3 Number of faculty members and students per state higher education institutions according to establishment waves (2019)

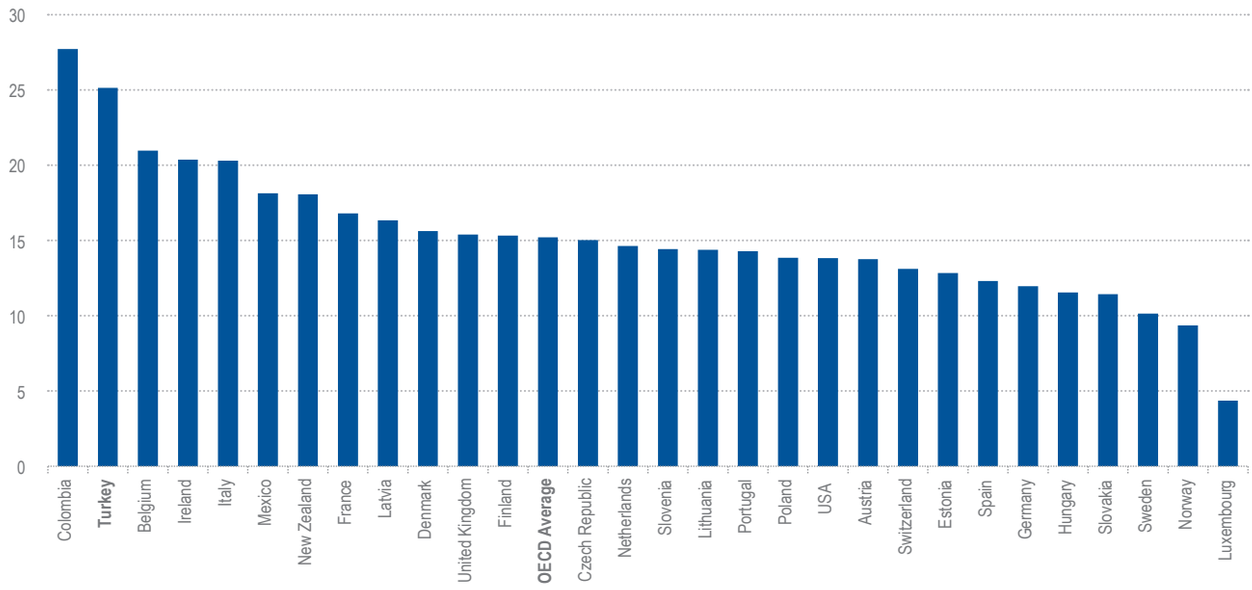


Source: Prepared using Higher Education Information Management System data.

INDICATOR E3 WHAT IS THE NUMBER OF STUDENTS PER ACADEMIC STAFF AND FACULTY MEMBERS?

This indicator examines the number of students per academic staff in higher education in OECD countries and the number of students per faculty member in state and foundation higher education institutions.

Figure E.3.1 Number of students per faculty member in higher education in OECD countries (2018)



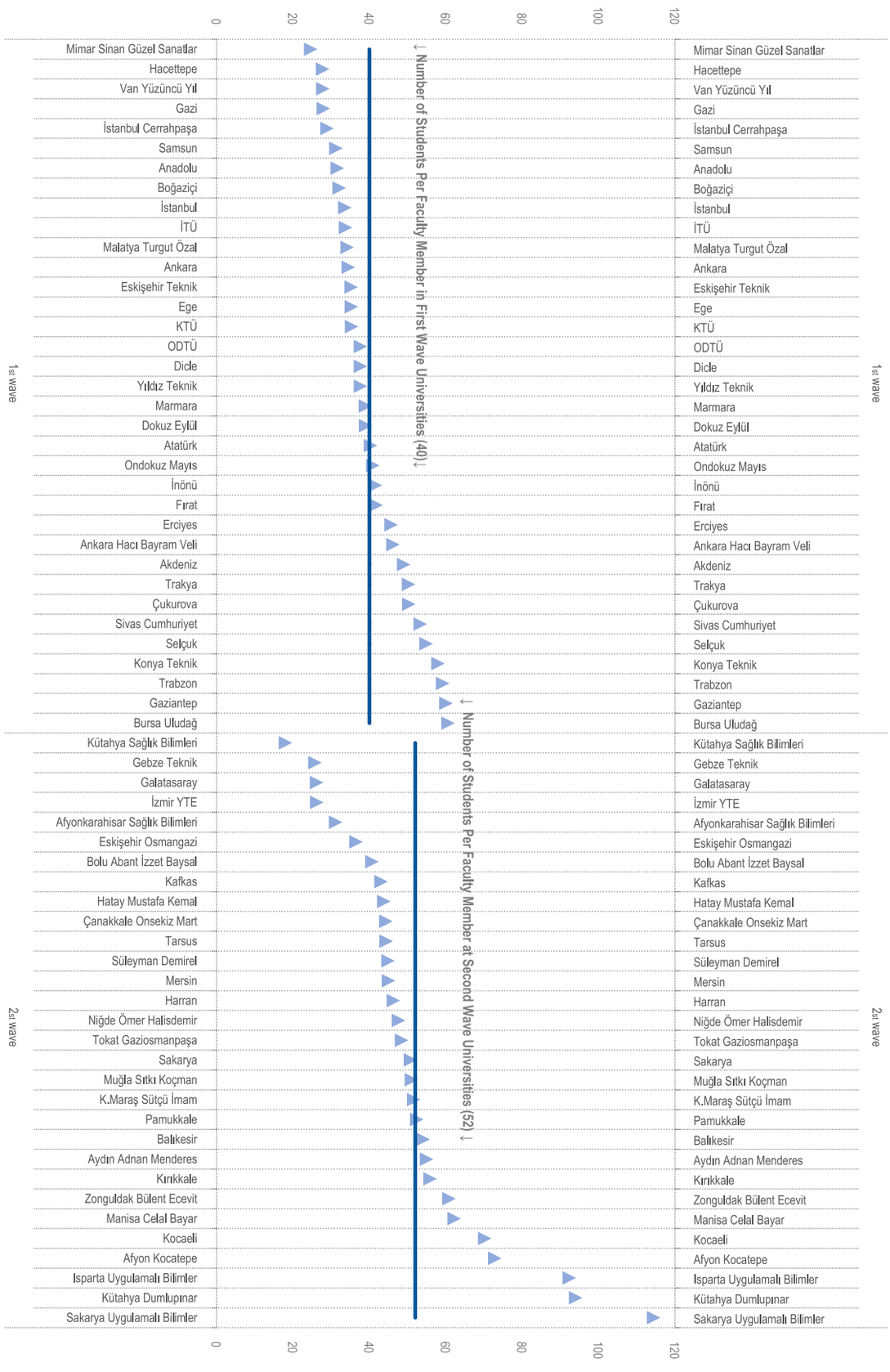
Source: OECD (2020).

Note: Calculations have been made based on full-time students.

Figure E.3.1 shows the number of students per academic staff in higher education in OECD countries in 2018. The average number of students per teaching staff in higher education is 15 in OECD countries. The number of students per teaching staff in higher education, is 28 in Colombia, 25 in Turkey, 21 in Belgium, 4 in Ireland and Luxembourg, 20 in Italy, 9 in Norway,10 in Sweden, 11 in Slovakia, and 12 in Hungary, Germany, Spain, Estonia and Switzerland. In terms of the number of higher education students per instructor, Turkey (25) ranks second highest amongst OECD countries, after Columbia. This indicates that Turkey is in need of teaching staff in higher education institutions. Taking into account the OECD average for faculty members per student, Turkey needs and additional 82,500 academic staff in its higher education institutions (see. Indicator D.3).

Figure E.3.2 shows the distribution of the number of students per faculty member in state universities established in the first and second wave in the 2019-2020 academic year. While the average number of students per faculty member in universities established in the first wave is 40, this number is 52 for universities established in the second wave. Universities established in both the first and the second wave differ among themselves in terms of the number of students per faculty member. The following universities founded in the first wave have higher averages in terms of students per faculty member than the first wave average of 40: Bursa Uludağ (61), Gaziantep (60), Trabzon (59), Konya Teknik (58), Selçuk (55), Sivas Cumhuriyet (53), Çukurova (50), Thrace (50), Akdeniz (49), Ankara Hacı Bayram Veli (46), Erciyes (46), Fırat (42), İnönü (42) and Ondokuz

Figure E.3.2 Distribution of the number of students per faculty member in first and second wave state universities (2019)



Source: Prepared using Higher Education Information Management System data.

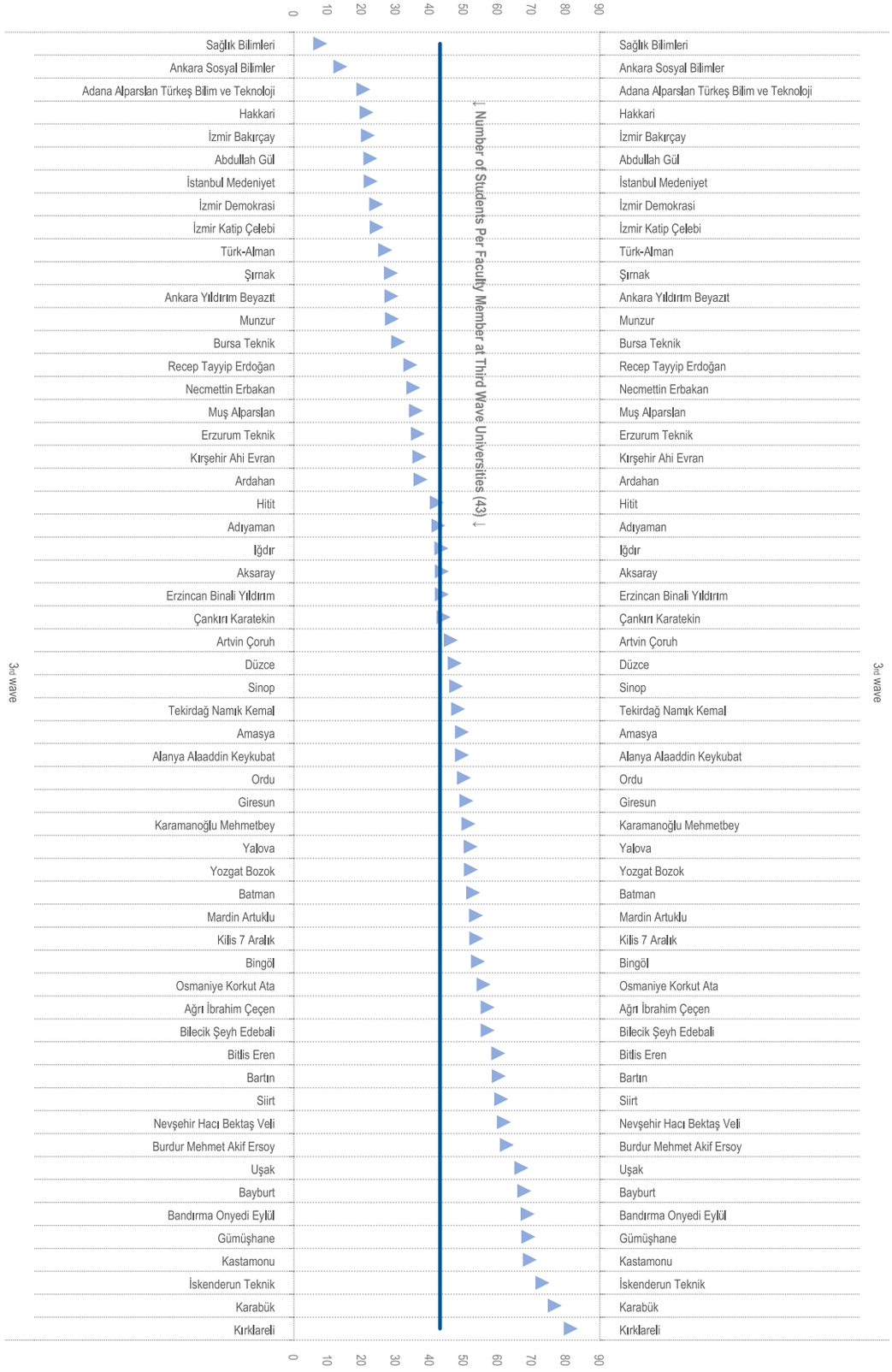
Mayıs (41). The following universities have an average of under 30: Mimar Sinan Fine Arts (25), Hacettepe (28), Van Yüzüncü Yıl (28), Gazi (28) and Istanbul Cerrahpaşa (29).

The average for the universities founded in the second wave are as follows: Sakarya Applied Sciences (114), Kütahya Dumlupınar (94), Isparta (92), Afyon Kocatepe (73), Kocaeli (70), Manisa Celal Bayar (62) and Zonguldak Bülent Ecevit (61). However, the average for the following second wave universites is under 30: Kütahya Health Sciences (18), Gebze Teknik (26) and Galatasaray (26) and İzmir Institute of Technology (26).

Figure E.3.3 shows the distribution of the number of students per faculty member in state universities established in the third wave according to the data from the 2019-2020 academic year. While there is an average of 43 students per faculty member in universities established in the third wave, universities established in the third wave differ among themselves in terms of the number of students per faculty member. The following third wave universities have an average of 65 or more students per faculty member: Kırklareli (81), Karabük (77), İskenderun Teknik (73), Kastamonu (69), Gümüşhane (69), Bandırma Onyedi Eylül (69), Bayburt (68) and Uşak (67). Meanwhile, the following third wave universities have an average of 30 or fewer students per faculty member: Health Sciences (8), Ankara Social Sciences (14), Adana Science and Technology (20), Hakkari (21), İzmir Bakırçay (22), Abdullah Gül (22), İstanbul Medeniyet (23), It is below 30 in İzmir Democracy (24), İzmir Katip Çelebi (24), Turkish-German (27), Şırnak (29), Ankara Yıldırım Beyazıt (29) and Munzur (29).

Figure E.3.4 shows the distribution of the number of students per faculty member in foundation universities for the 2019-2020 academic year. There is an average of 41 students per faculty member at foundation universities. In addition, there is a great variation among foundation universities in terms of the number of students per faculty member. The following universities have an average of 60 or more students per faculty member: Istanbul Ayvansaray (138), Cag (92), Istanbul Bilgi (74), Uskudar (72), Istanbul Kultur (71), Beykent (66), Istanbul Aydin (65), Nisantasi (64), Golden Horn (63), Cappadocia (63), Istanbul Gelişim (62), Işık (62) and Arel (60). Meanwhile, the following universities have an average of 15 or fewer students per faculty member: Yüksek İhtisas (8), Acıbadem Mehmet Ali Aydınlar (10), Konya Food and Agriculture (12), Ibn Haldun (13), Sanko (13), Lokman Hekim (14), Bezm-i Âlem Vakıf (14) and Demiroğlu Bilim (15).

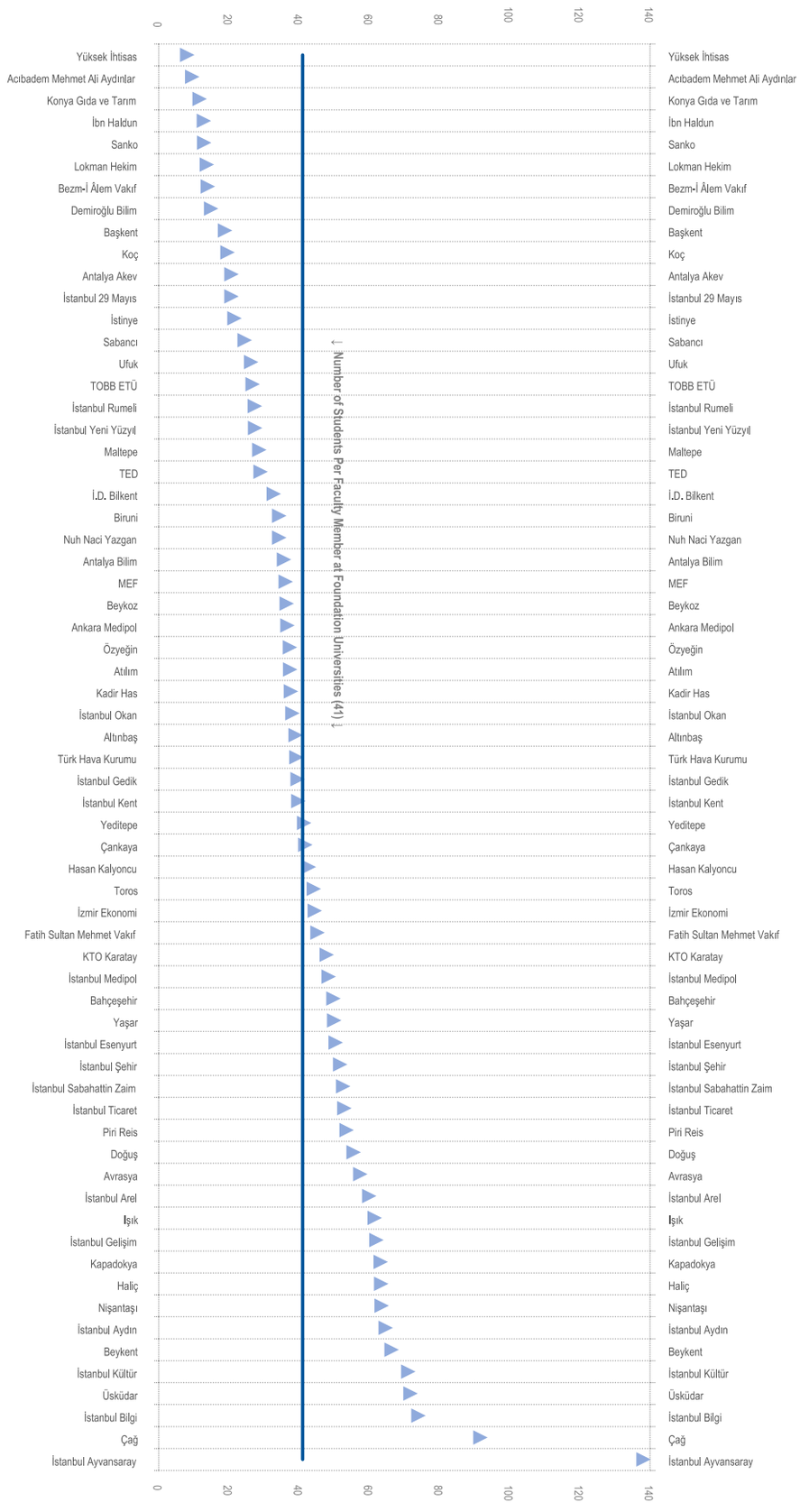
Figure E.3.3 Distribution of the number of students per faculty member in state universities established in the third wave (2019)



Source: Prepared using Higher Education Information Management System data.

Note: The following universities who have less than one thousand students have not been included in this graph and calculations: Ankara Music and Fine Arts University, Gaziantep Islamic Science and Technology University and Sivas Science and Technology University. In addition, Kahramanmaraş İstiklal University, a university which has only 7 faculty members has not been included.

Figure E.3.4 Distribution of the number of students per faculty member in foundation universities (2019)



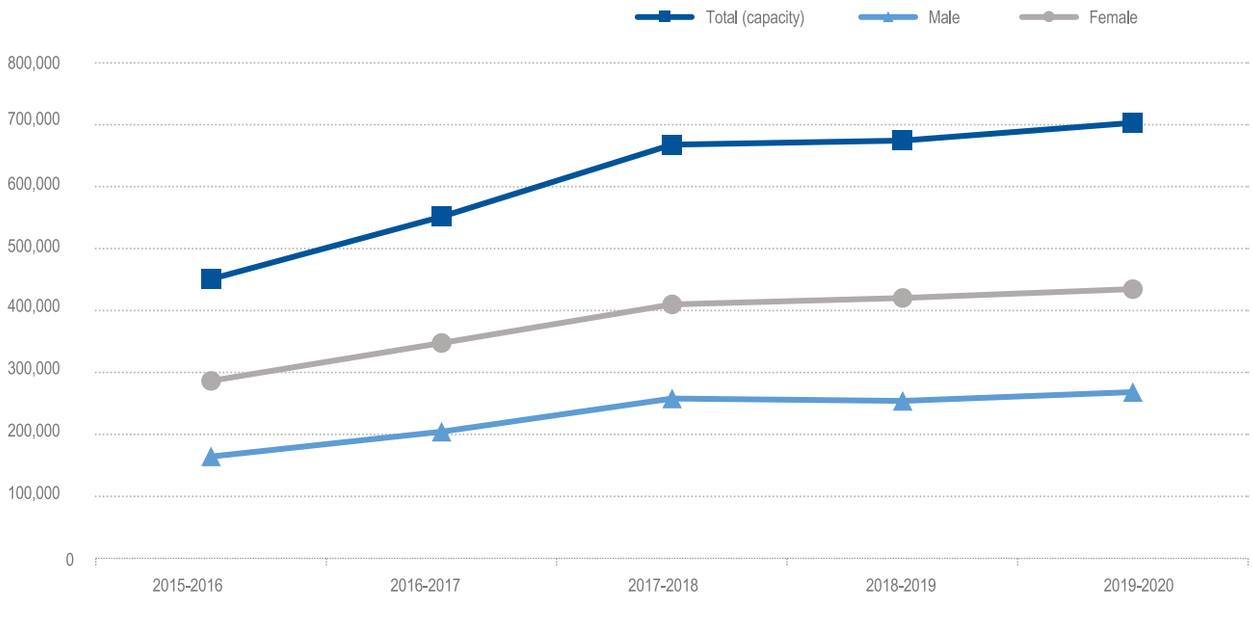
Source: Prepared using Higher Education Information Management System data.

INDICATOR E4 WHAT IS THE KYK DORMITORY CAPACITY?

This indicator examines change in KYK dormitory capacity and the number of KYK dormitories by gender.

Figure E.4.1 shows the change in KYK dormitory capacities between 2015 and 2019 by gender. The total capacity of KYK dormitories was 450,491 with 286,623 female spots and 164,318 male ones in 2015. As of the 2019-2020 academic years. the female capacity increased to 434,763, the male capacity to 268,412, and the total capacity to 703,175.

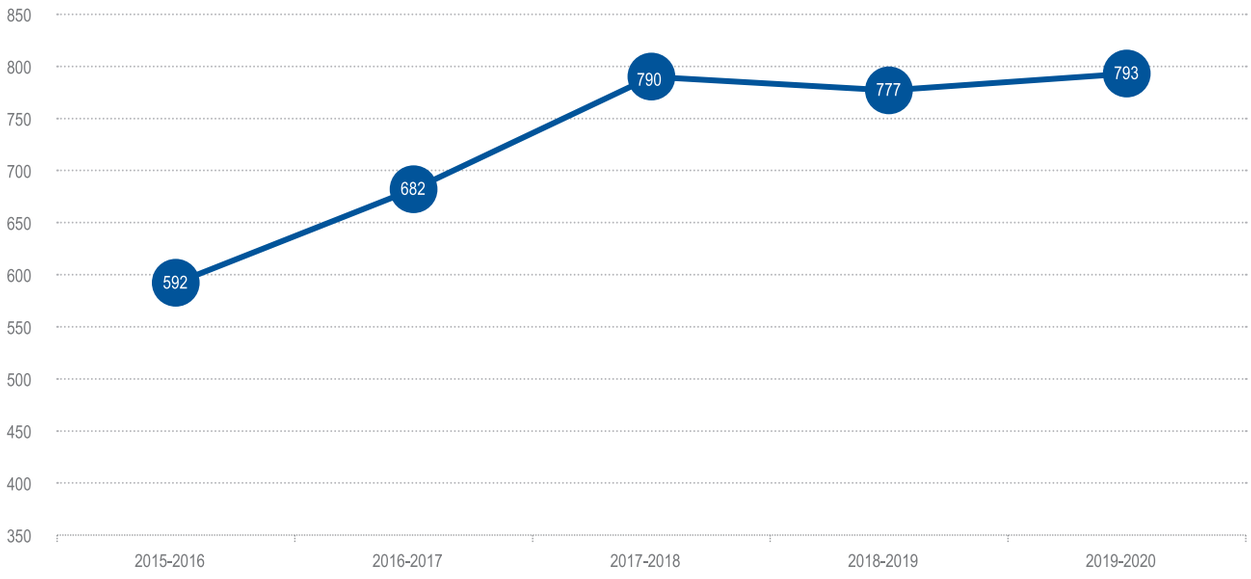
Figure E.4.1 Trends in KYK dormitory capacities by gender (2015-2019)



Source: Prepared using MEB statistics and KYK activity reports published in various years

The change in the number of KYK dormitories between 2015 and 2019 is shown in Figure E.4.2. The number of KYK dormitories is 592 in 2015. This number increase to 793 in the 2019-2020 academic year.

Figure E.4.2 Trends in the number of KYK dormitories (2015-2019)



Source: Prepared using MEB statistics and KYK activity reports published in various years.

CHAPTER E CONCLUSIONS AND RECOMMENDATIONS

- There are extreme differences between state and foundation higher education institutions in terms of the number of students per academic staff and teaching staff. Priority should be given to meeting the personnel needs of higher education institutions that need academic staff.

- Considering Turkey's shortage of academic staff compared with those of other countries with similar populations, we can see that Turkey fewer universities than these countries. This means that there is an insufficient number of universities in the country. The number of higher education institutions in Turkey should be increased and new universities should be established in the provinces which need them.

- In order to use dormitory capacities more efficiently, the location and size of the newly built dormitories should be determined by considering the supply-demand balance.

CHAPTER E

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CHAPTER F

FINANCING OF HIGHER EDUCATION

Investing in education is considered an investment in human capital. Among the Organization for Economic Cooperation and Development (OECD) countries, the individual net financial return of higher education is around 1.5 times that of secondary education (OECD, 2020). Additionally, higher employment, tax payment, and social contributions of higher education graduates show the reasons for public investment in higher education. Countries invest in higher education institutions to stimulate economic growth, increase productivity, contribute to personal and social development, and reduce social inequalities, among other reasons. However, the financing of higher education differs among OECD countries in several respects, such as the distribution of funding between public and private sources, whether or not fees are charged, and the support mechanisms of financial support (OECD, 2020).

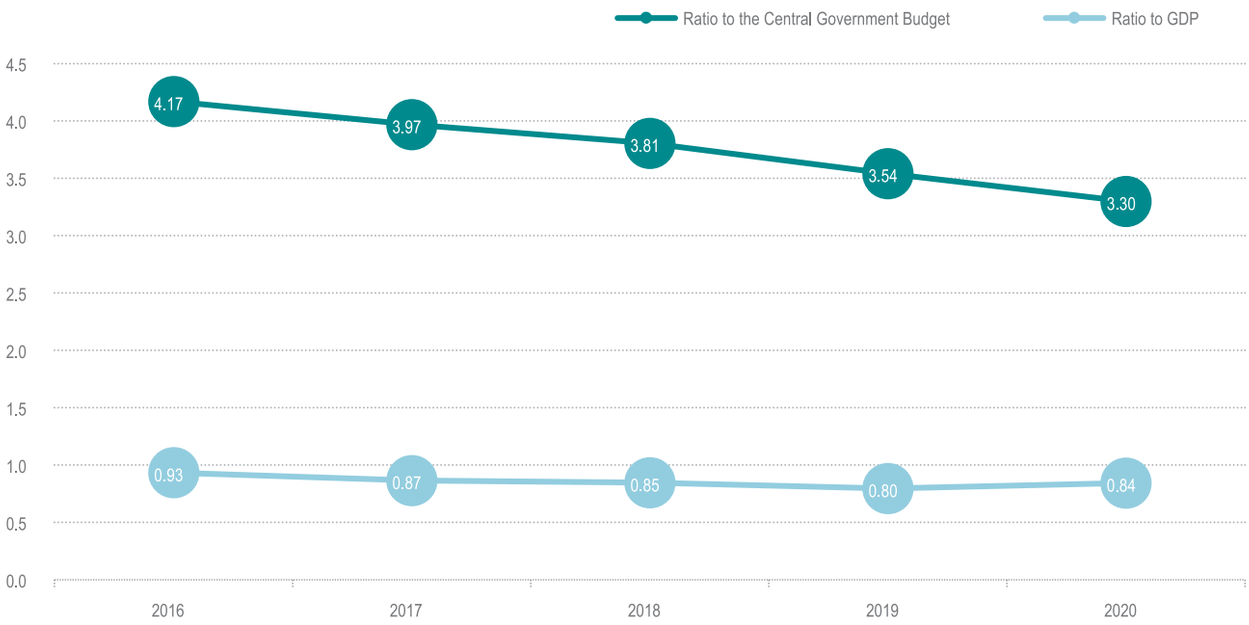
This section will firstly examine the financing of higher education in Turkey in terms of the higher education budget allocated from the Gross Domestic Product (GDP), or the central government budget, and the proportion of public and private spending on education. Then, expenditure per student in higher education and expenditure per student by universities will be assessed. In terms of another indicator, the distribution of the higher education budget according to economic classifications, the budget allocated for higher education investments, and gross domestic Research and Development (R&D) expenditures by sector will be analyzed. Finally, tuition fees, the total amount of scholarships and education loans given, along with an indicator of how many students benefit from the scholarships and loans will be included. Data on these indicators will be presented in comparison with OECD data.

INDICATOR F1

HOW MUCH OF THE BUDGET AND GDP IS ALLOCATED TO HIGHER EDUCATION?

This indicator will examine the change in the ratio of the higher education budget in relation to the GDP and central government budget by year and the change in public higher education expenditures. Data from the Turkey Statistical Institute (TURSTAT) 's Education Expenditure Statistics has been used to examine education spending in terms of financial resources. Additionally, data from OECD countries has been presented comparatively.

Figure F.1.1 Trends in the ratio (%) of higher education budget to GDP and the central government budget (2016-2020)

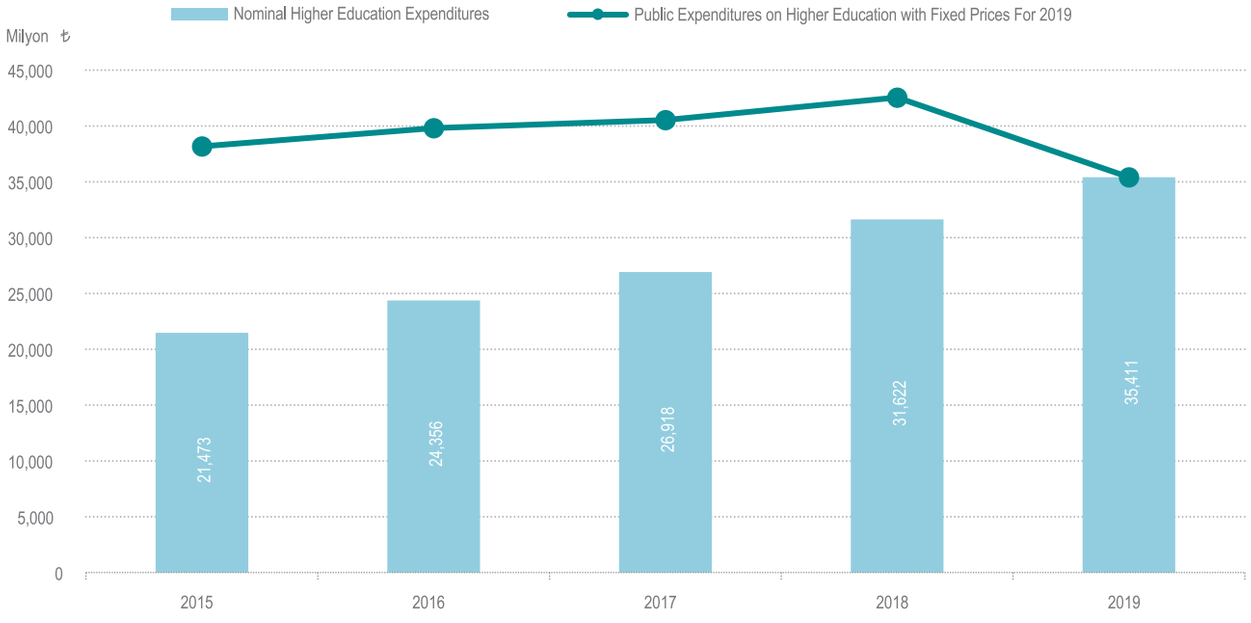


Source: Prepared using MEB statistics published in various years and data from the Ministry of Treasury and Finance.
Note: 2020 data has been calculated based on the predicitons.

Figure F.1.1 shows the change in the ratio of the higher education budget in comparison to GDP and the central government budget between 2016 and 2020. There has been a partial decrease in the ratio of the higher education budget to the central government budget between 2016-2020. While the ratio of the higher education budget to the central government budget was 4.17% in 2016, it decreased to 3.3% in 2020. The ratio of the higher education budget to GDP decreased from 2016 to 2019, and was 0.8% in 2019, and 0.93% in 2016. In 2020, the ratio of the budget allocated to higher education as part of GDP is calculated as 0.84%. Therefore, we can conclude that the share allocated from the central government budget to the higher education budget has continuously decreased in the last five years.

Figure F.1.2 shows the change in public higher education expenditures between 2015 and 2019. In calculations made with fixed prices, it is necessary to compare and interpret the years before the price fixing year. Nominal higher education expenditures, in other words, higher education expenditures, increased between 2015 and 2019. Nominal higher education expenditure, which was 21.47 billion TL in 2015, was 35.41 billion TL in 2019.

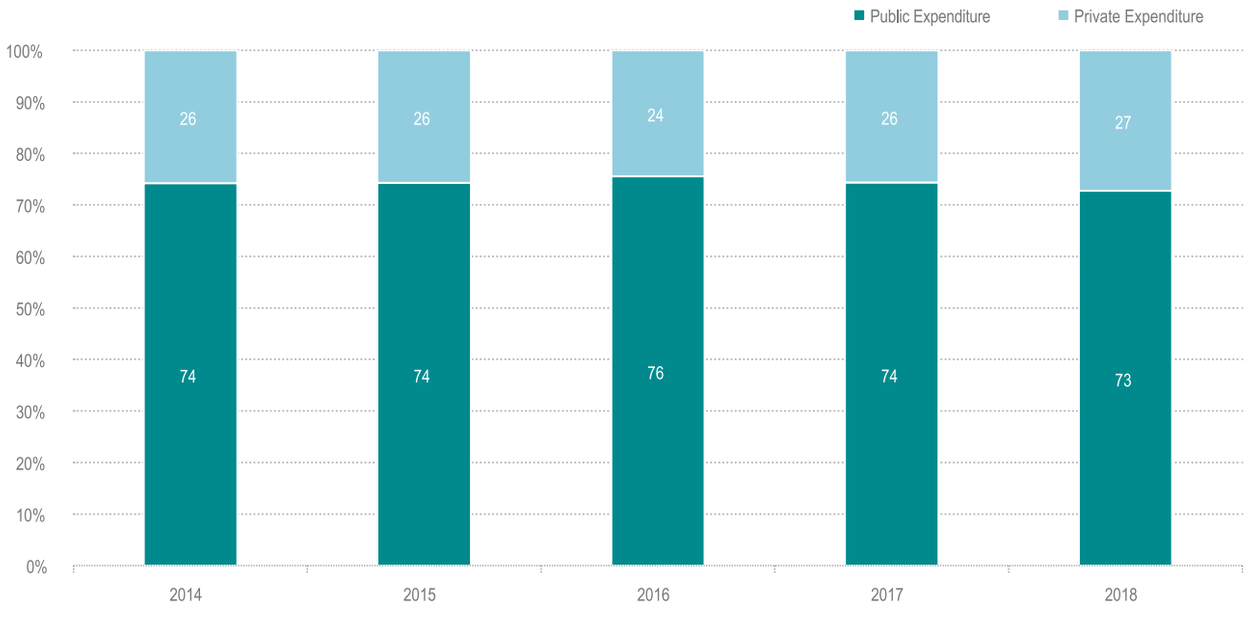
Figure F.1.2 Trends in public higher education expenditures (million ₺) (2015-2019)



Source: Prepared using data of the Ministry of Treasury and Finance.

When we analyze the fixed prices of 2019, we can see that public expenditure on higher education tends to increase slightly in 2015 and 2018. Public expenditures on higher education with fixed prices in 2019 were 38.18 billion TL in 2015 and 42.55 billion TL in 2018. In 2019 this rate experienced a decline and decreased to

Figure F.1.3 Trends in the distribution of education expenditures for higher education by financial source (%) (2014-2018)



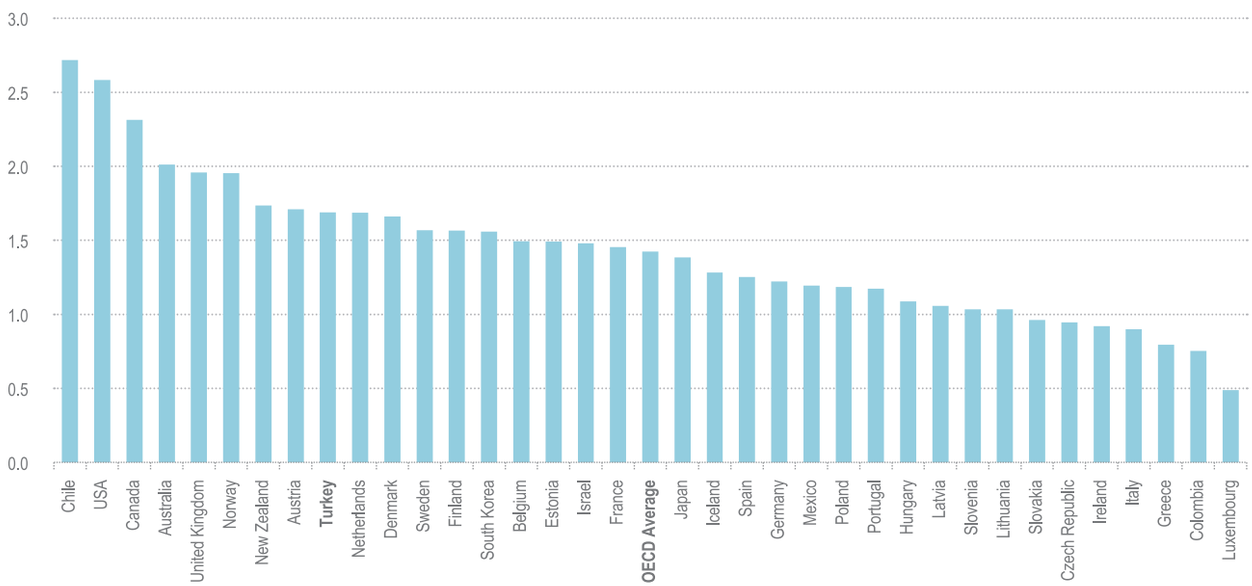
Source: Prepared using TUIK (2019) Education Expenditure Statistics.
Note: Expenditure from international sources is not shown in the figure as it is very minor.

35.41 billion TL. Consequently, when we analyze public expenditures on higher education at fixed prices, we can see that there has been a partial increase in the last five years, but an overall decrease afterwards.

The change in the distribution of education expenditures made to higher education between 2014 and 2018 by financial source is shown in Figure F.1.3. According to TUIK's Education Expenditures Statistics, 74% of education expenditures on higher education in 2014 were state expenditures and 26% were private expenditures. In 2018, 73% of these expenditures were state expenditures and 27% were private expenditures.

The ratio of higher education expenditures in GDP in OECD countries for 2017 is given in Figure F.1.4. Higher education expenditures here include public, private and international resources, while public expenditures include the budget allocated for higher education, fees, accommodation, transportation, food, etc. Although there are great differences among OECD countries, these countries have all spent an average of 1.42% of their GDP on higher education. While the shares of Chile (2.72%), USA (2.58%), Canada (2.31%) and Australia (2.01%) of their GDP is over 2%, the shares of Luxembourg (0%), 49), Colombia (0.75%), Greece (0.79%), Italy (0.90%), Ireland (0.92%), Czechia (0.95%) and Slovakia (0.96%) are less than 1%. On average, OECD countries spend (1.42%) of their GDP on higher education, while this rate is (1.69%) in Turkey. Turkey's higher education the allocation of GDP ratio of 1.69% makes up 80% of the higher education expenditure (see. Table F.1.5). 1.3% of this makes up public resources and 0.87's% (see. Figure F.1.1) constitutes the budget allocated for higher education. The ratio of 0.43% in between includes the expenditures made by the public for students (fees, accommodation, food, etc. budgets allocated to KYK).

Figure F.1.4 Total expenditure on higher education as a percentage of GDP in OECD countries (%) (2017)



Source: (OECD, 2020).

Table F.1.5 Total expenditure on higher education as a percentage of public, private (household and other private expenditure) and international expenditure

	Public Expenditure	Private Expenditure			International Sources
		Household Expenditures	Expenditures of Other Private Organizations	All Private Resources	
Colombia	100	-	-	-	-
Denmark	99	-	1	1	-
Finland	92	-	3	4	5
Norway	92	4	3	7	1
Austria	91	3	6	9	-
Iceland	90	7	1	8	2
Luxembourg	89	3	3	6	5
Sweden	84	1	11	12	4
Germany	83	-	-	15	2
Slovenia	83	11	2	13	4
Belgium	82	8	6	14	3
Poland	81	15	4	19	1
Turkey	**80**	**11**	**9**	**20**	**1**
France	77	11	10	21	2
Greece	77	15	-	15	8
Czech Republic	73	9	14	23	4
Estonia	72	7	8	15	13
Mexico	70	30	0	30	-
Slovakia	68	15	14	29	3
OECD Average	**68**	**21**	**9**	**29**	**3**
Ireland	67	26	2	29	4
Netherlands	67	17	13	30	3
Spain	66	29	3	32	2
Hungary	65	-	-	33	2
Lithuania	64	22	8	30	6
Italy	62	29	6	35	3
Latvia	60	28	5	33	8
Portugal	60	29	4	33	7
Israel	54	28	17	46	-
Canada	54	22	24	46	-
New Zealand	51	33	16	49	-
South Korea	38	43	19	62	-
Australia	36	49	15	64	-
Chile	36	58	7	64	-
USA	35	45	19	65	-
Japan	31	53	16	69	-
United Kingdom	25	52	19	71	4

Source: (OECD, 2020).

Table F.1.5 shows the rates of public, private (household and other private expenditures) and international expenditures in total higher education expenditures in OECD countries. The countries with the highest public expenditure as a rate of higher education expenditure are as follows: Colombia (100%), Denmark (99%), Finland (92%), Norway (92%), Austria (91%), Iceland (90%) and Luxembourg (89%). Those with the lowest rates at below 50% are as follows: United Kingdom (25%), Japan (31%), the USA (35%), Chile (36%), Australia (36%) and South Korea (38%). In comparison to other countries, the countries which have low public expenditures have high household expenditure. In addition, tuition fees, which are included in household expenditures, are higher in these countries than in other countries (see Figure F.4.1). In comparison with the OECD average of 68%, Turkey has

a higher average public expenditure rate at 80%. Turkey has a household spending rate of 11%, much lower than the OECD average of 21%. According to data from 2015, the rate of higher education spending within public spending increase by 5% points in Turkey, while the average in OECD countries increased by only 2% points (Gür et al., 2019). As has been expressed, Turkey's share of GDP that is allocated to the higher education budget is decreasing every year. Although the ratio of total higher education expenditures to GDP is higher than the average of OECD countries, it is still a small amount. The main indicator of this is the expenditure per student (see Figure F.2.2).

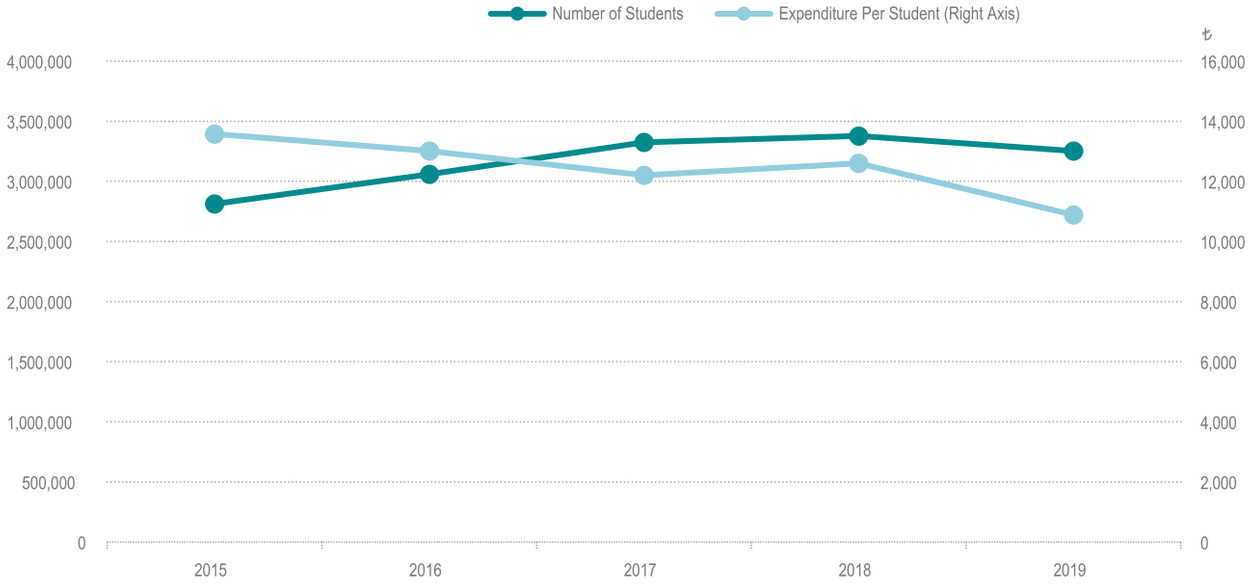
While Turkey's nominal higher education expenditure may be increasing at a minor rate, the amount allocated to the higher education budget as part of GDP and the central government budget has been decreasing in recent years. In addition, Turkey ranks high amongst OECD countries in terms of higher education spending within public spending (higher education budget, housing, food, transportation, tuition fees, student loans, scholarships, etc.) However, although this rate is high, the quantity remains low.

INDICATOR F2

HOW MUCH IS SPENT PER STUDENT?

Personnel expenses, infrastructure studies, R&D activities, programs provided to students and the number of enrolled students in higher education institutions affect the level of expenditure per student. This indicator will examine the expenditures made per student according to year and the waves in which universities were established. In addition, data on expenditure per student in higher education in OECD countries will be analyzed comparatively.

Figure F.2.1 Trends in the number of face-to-face students and expenditure per student (₺) in state higher education institutions (2015-2019)

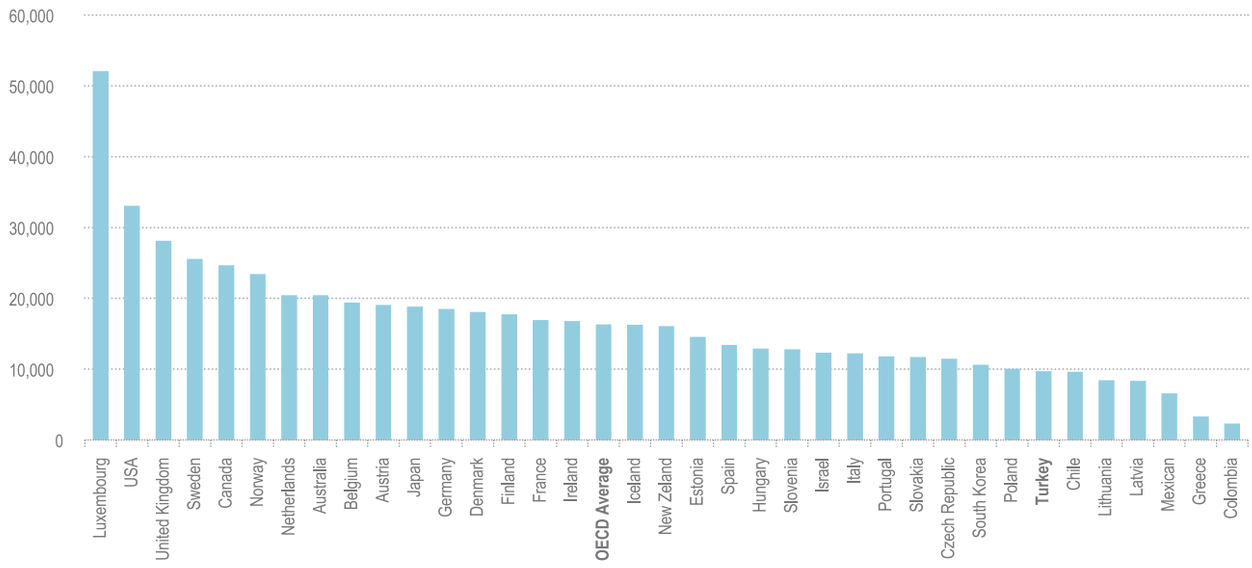


Source: Prepared using the Higher Education Information Management System and data from MEB and the Ministry of Treasury and Finance.

Note: The number of students studying at state universities, and open education students are excluded from the calculation. Calculations were made with fixed prices for 2019.

Figure F.2.1 shows the change in the number of face-to-face students and expenditure per student in state higher education institutions between 2015 and 2019. Nominal higher education expenditures are calculated with 2019 fixed prices. The number of students includes associate, undergraduate and graduate levels. The end of the academic year is taken as basis for the number of students. For example, the number of students in the 2014-2015 academic year is expressed as 2015. The number of students studying face-to-face in higher education has increased from 2015 to 2018. While the expenditure per student in higher education was 13.578 TL in 2015, it decreased to 12.197 TL in 2016 and 2017, and increased to 12.596 in 2018. Although this expenditure increase or decrease is parallel with the number of students, we can see that the average expenditure per student in higher education in state higher education institutions has a decreasing trend over time.

Figure F.2.2 Total expenditure ($) on higher education per full-time equivalent student in OECD countries (2017)



Source: (OECD, 2020).

Note: Calculated according to purchasing power parity.

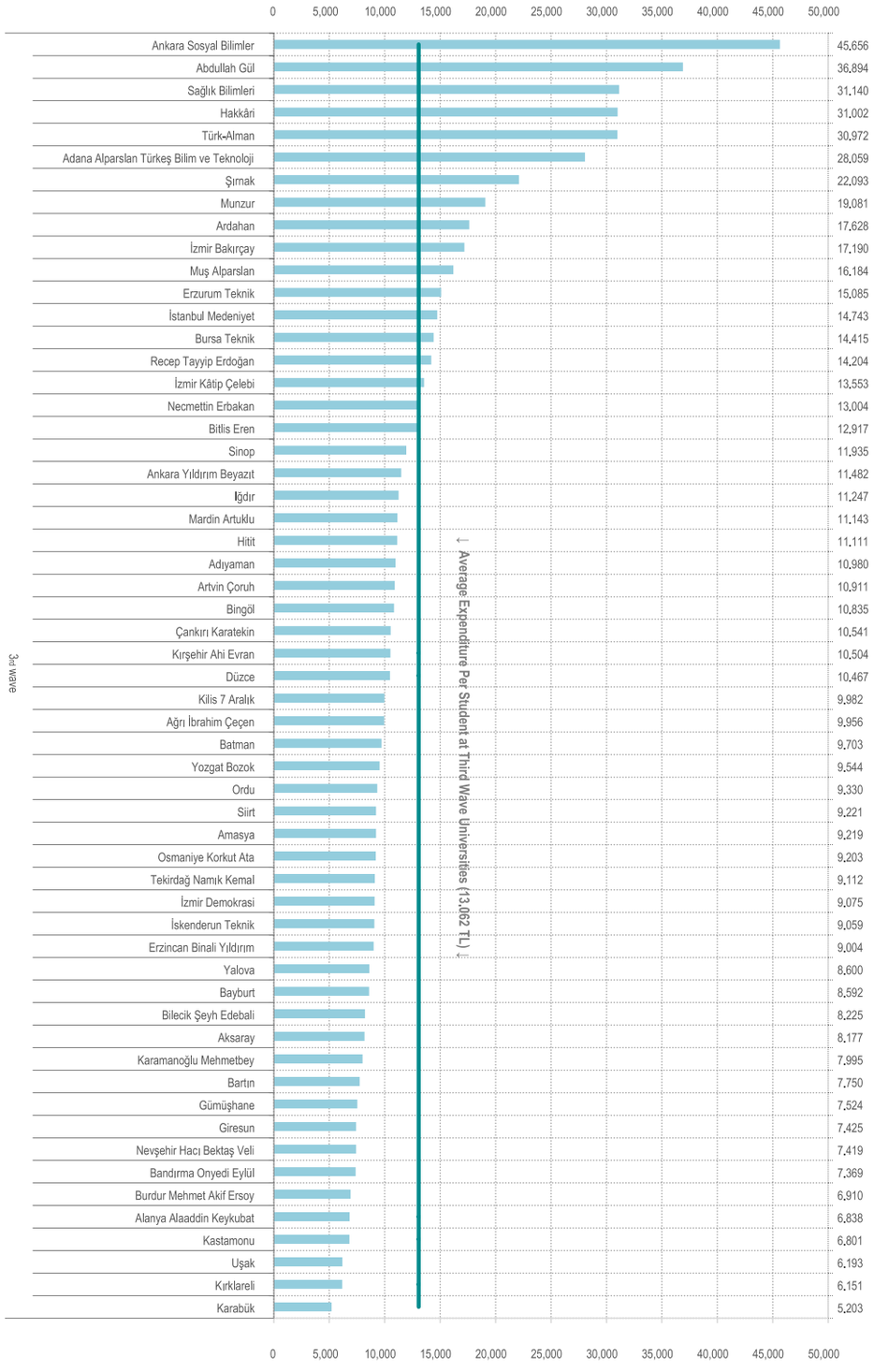
Figure F.2.2 shows the expenditures made per student in higher education in OECD countries for 2017. Expenditure per student in higher education differs significantly among OECD countries. While Luxembourg spends approximately 52 thousand dollars per student in higher education, the USA spends 33 thousand dollars, the United Kingdom 28 thousand dollars and Sweden 26 thousand dollars. Canada, Norway, the Netherlands and Austria each spend between 20 thousand and 25 thousand dollars. Colombia (2 thousand 300 dollars) and Greece (3 thousand 300 dollars) are the countries with the lowest spending per student in higher education, while Mexico (6 thousand 600 dollars), Latvia (8 thousand 300 dollars), Lithuania (8 thousand 400 dollars), Chile (9 thousand 600 dollars) and Turkey (9 thousand 700 dollars) spend less that the OECD average (16 thousand 300 dollars).

In Figure F.2.3, the expenditures foreseen to be made per student by first and second wave universities in 2020. Figure F.2.4 shows the same rates of third wave universities. In the calculations here, the 2020 budgets of higher education institutions were taken and the expected expenditure per student for 2020 was calculated by dividing the 2019-2020 academic year by the number of students. The average expenditure foreseen per student in first wave universities is 13,835 TL. Among the first wave universities, Hacettepe (22.408 TL), Gazi (21.437 TL), Boğaziçi (21.384 TL) and Anadolu (21.039 TL) spend the most with more than 20 thousand TL per student. Kayseri (2.968 TL), Konya Teknik (6.778 TL), Trabzon (7.615 TL), Ankara Hacı Bayram Veli (8.441 TL), Bursa Uludağ (9.488 TL), Selçuk (9.813 TL) and Akdeniz (9.821 TL) are the universities that spend the least with less than 10 thousand TL per student. Kahramanmaraş İstiklal (24.797 TL), Galatasaray (24.699 TL), İzmir YTE (24.419 TL), Kütahya Health Sciences (19.422 TL), Gebze Technical (19.316 TL), Tarsus (18.712 TL), Afyonkarahisar Health Sciences (18.248 TL) and Eskişehir Osmangazi (15,443 TL) universities are all second wave universities which spend more than the average second wave expenditure per student (11,919 TL). As a result of the division of universities, the number of students at some newly established universities in the first wave is not high, so the amount of expenditure foreseen per student here is also low. Sakarya Applied

Figure F.2.3 Projected expenditure per student according at first and second wave universities (₺) (2020)

Source: Prepared using the Higher Education Information Management System and data from the Ministry of Treasury and Finance.

Figure F.2.4 Projected expenditure per student according at third wave universities (₺) (2020)



Source: Prepared using the Higher Education Information Management System and data from the Ministry of Treasury and Finance.

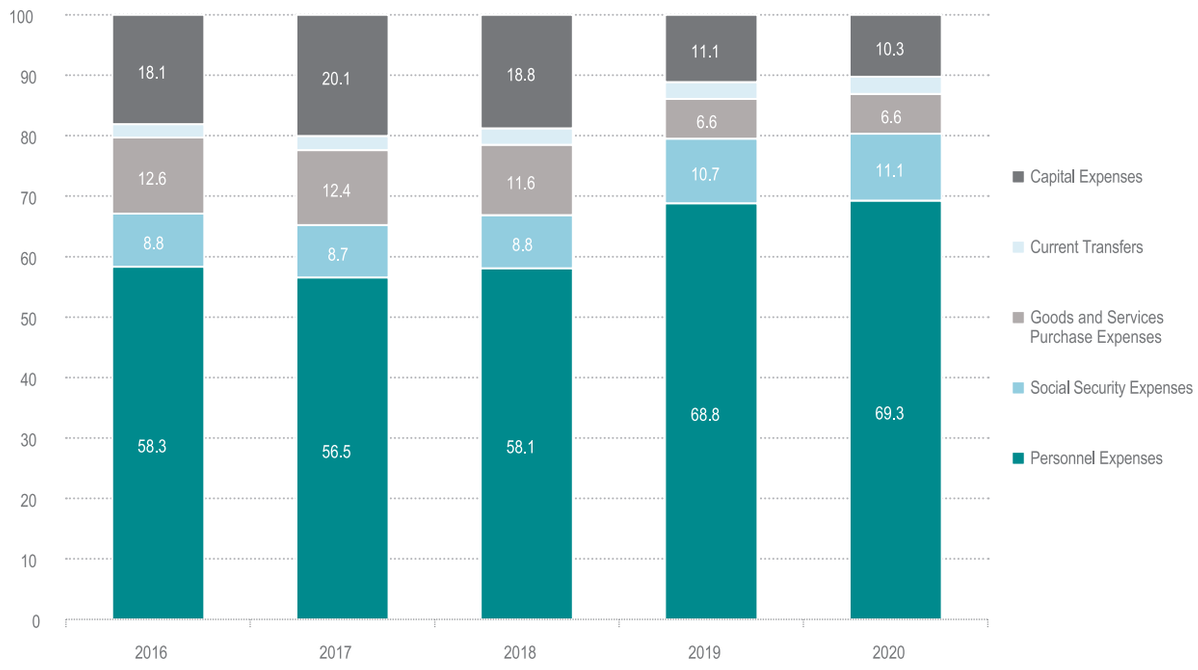
Sciences (4.604 TL), Isparta Applied Sciences (5.177 TL), Kütahya Dumlupınar (5.964 TL), Afyon Kocatepe (6.986 TL) and Balıkesir (7.887 TL) universities, spend the least per student among the second wave universities. The low expenditures foreseen per student in the new universities established as a result of the division is due to the high number of students.

Figure F.2.4 shows that the average expenditure amount foreseen per student in third wave universities is 13.062 TL. Among the 57 universities in the third wave, Ankara Social Sciences (45.656 TL), Abdullah Gül (36.894 TL), Health Sciences (31.140 TL), Hakkari (31.002 TL), Turkish-German (30.972 TL), Adana Alparslan Türkeş Science and Technology (28.059 TL), Şırnak (22.093 TL), Munzur (19.081 TL), Ardahan (17.628 TL), İzmir Bakırçay (17.190 TL), Muş Alparslan (16.184 TL), Erzurum Teknik (15.085 TL), İstanbul Medeniyet (14.743 TL), Bursa Teknik (14,415 TL), Recep Tayyip Erdogan (14,204 TL) and Izmir Kâtip Çelebi (13,553 TL) universities have higher spending per student than the average expenditure per student in third wave universities.Among the third wave universities, Karabük (5.203 TL), Kırklareli (6.151 TL), Uşak (6.193 TL) and Kastamonu (6.801 TL) universities have the least expected amount of expenditure per student. The decrease in capital expenditures every year within the higher education budget, the decrease of this ratio to 10.3% in 2020 (see Figure F.3.1), the low capital expenditures of some higher education institutions, and the high capital expenditures of newly established higher education institutions. All depending on the number of students. This situation causes a considerable difference in the amount of expenditure per student between state higher education institutions.

INDICATOR F3 WHAT IS THE DISTRIBUTION OF THE HIGHER EDUCATION AND R&D BUDGET ACCORDING TO ECONOMIC CLASSIFICATION?

The distribution of higher education expenditures are distributed between current expenditures and capital expenditures affects the level of staff salaries, the infrastructure of educational settings, and the provision of services such as meals, transportation, housing and research activities. This indicator will examine how the higher education budget is distributed according to the economic classification and the shares allocated to higher education investments from central government budget investments. This data will be compared to data from OECD countries. Data from TÜIK's Research & Development (R&D) Activities in Turkey Research has been used to examine gross domestic expenditure, R&D statistics, the sectoral distribution of GDP.

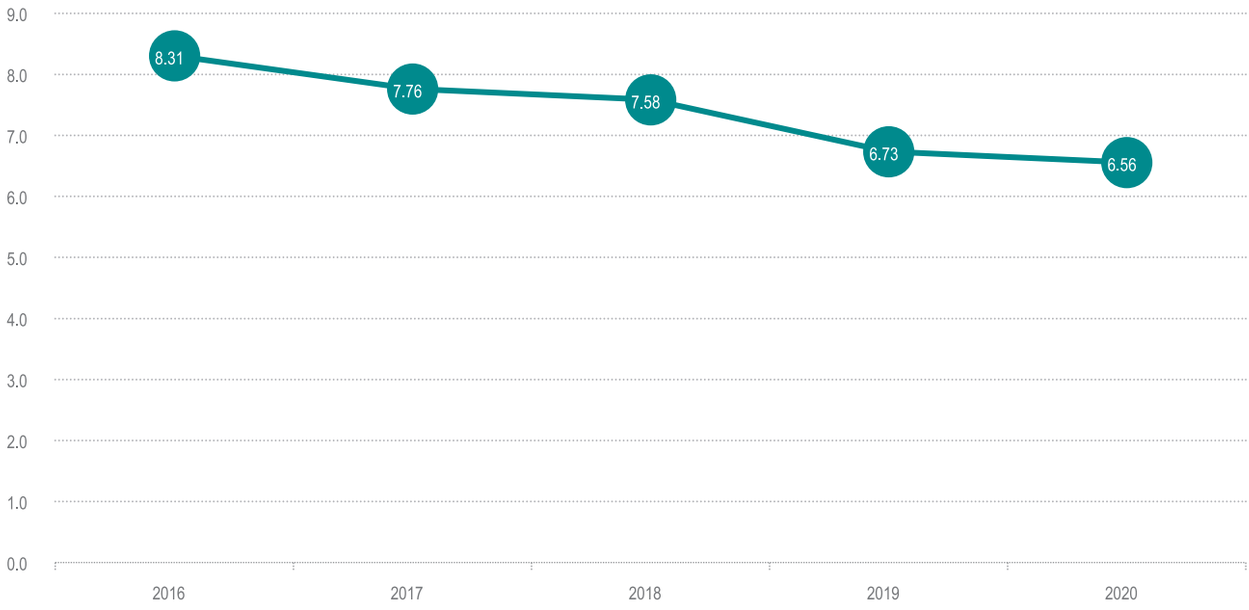
Figure F.3.1 Trends in the distribution of higher education budget according to economic classification (%) (2016-2020)



Source: Prepared using MEB statistics published in various years and data from the Ministry of Treasury and Finance.

Figure F.3.1 shows the change in the distribution of the higher education budget according to economic classification between 2016 and 2020. In 2019 and 2020, there was a significant decrease in the purchase of goods and services and capital (investment) expenses in the higher education budget, while personnel expenses, and therefore social security expenses, increased. While capital expenditures were 18.1%, goods and service procurement expenses were 12.6% in the higher education budget in 2016. These decreased to 10.3% and 6.6% respectively in 2020. Personnel expenses within the higher education budget increased from 58.3% in 2016 to 69.3% in 2020.

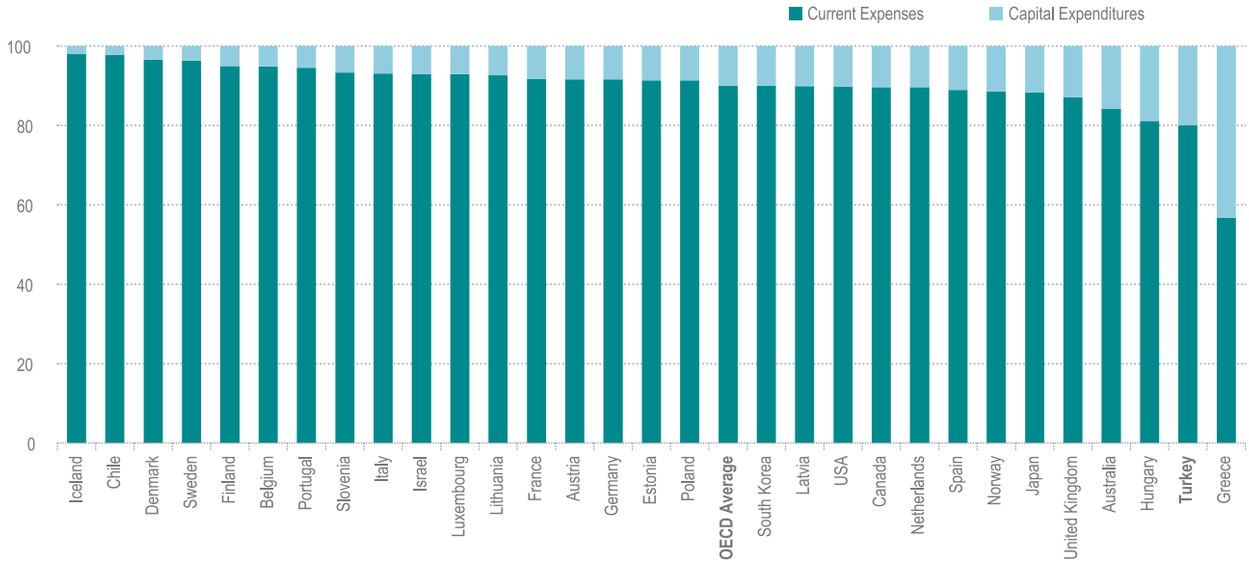
Figure F.3.2 Trends in the share (%) of the central budget allocated to higher education investments (2016-2020)



Source: Prepared using MEB statistics published in various years and data from the Ministry of Treasury and Finance.

Figure F.3.2 shows the change in the share allocated to higher education investments among central budget investments between 2016 and 2020. From 2016 to 2020, the share allocated to higher education investments from the central government budget investments has continuously decreased. The share allocated to higher education investments from the central government budget investments, which was 8.31% in 2016, was 6.56% in 2020.

Figure F.3.3 Share of current and capital expenditures in higher education expenditures in OECD countries (%) (2017)



Source: (OECD, 2020).

In Figure F.3.3, the share of current and capital (investment) expenditures in higher education expenditures in OECD countries for 2017 is given. The countries which had the highest 2017 higher education spending in capital expenditure were Greece (43%), Turkey (20%), Hungary (19%), Australia (16%), United Kingdom (13%) and Japan (12%). The average of OECD countries in terms of capital expenditure ratio in higher education expenditures is 10%. Iceland (98%), Chile (98%), Denmark (97%), Sweden (96%), Finland (95%), Belgium (95%) and Portugal (95%) are the countries with the highest spending rates at above 95%.

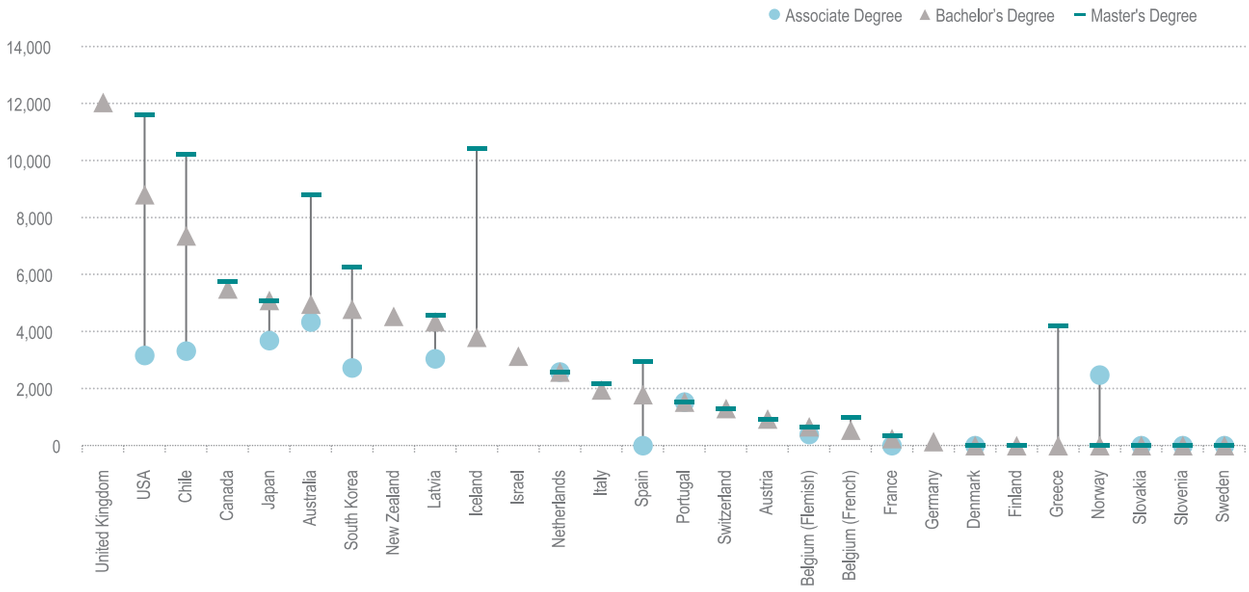
Although Turkey has more capital expenditures in higher education spending compared to the OECD average, the country has had a decrease in this budget since 2017. In the last three years, the share of capital expenditures went from 20.1% to 10.3% (see Figure F.3.1).

INDICATOR F4

WHAT KIND OF PUBLIC SUPPORT DO STUDENTS RECEIVE?

This indicator examines the average annual tuition fees paid by higher education students in OECD countries. Data on loans and scholarships granted to higher education students by the Credit and Hostels Institution (KYK) was analyzed in three periods of five years.

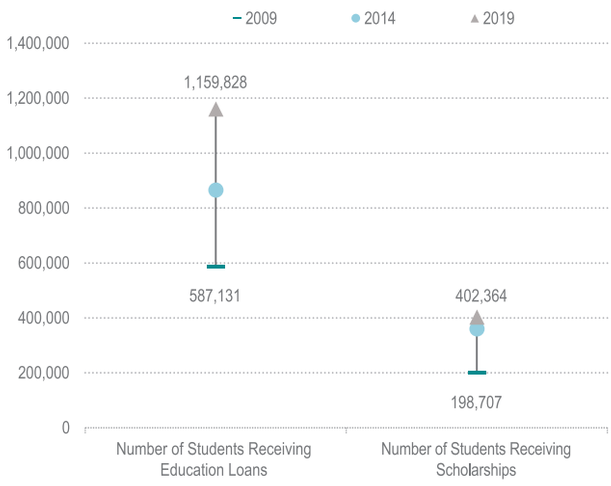
Figure F.4.1 Average annual tuition fees paid by national students at public universities by level of education in some OECD countries (2017/18)



Source: (OECD, 2020).
Note: Calculated according to purchasing power parity.

Figure F.4.1 shows the average annual tuition amounts paid by national students at public universities in the 2017/18 academic year in some OECD countries according to their education level. In OECD countries, there are different approaches to providing financial support to higher education students and to sharing higher education costs between government, students and their families and other private organizations (OECD, 2020). There are no tuition fees at the associate, undergraduate and graduate level for national students in Slovakia, Slovenia, Sweden and Denmark; for the undergraduate and graduate level in Norway and Finland, and undergraduate level in Greece. There is no associate degree level of higher education in Germany, Finland and Greece (see Figure A.3.4). In addition, there are tuition fees of less than a thousand dollars in Austria, Belgium, France and Germany. In countries such as the United Kingdom, the USA, Chile, Canada, Japan, Australia, South Korea, New Zealand and Latvia, higher levels of tuition fees are charged to national students, and tuition fees rise as the level of education increases. In Turkey, state universities do not charge any fees for the undergraduate, graduate, or docotrate degree level.

Figure F.4.2 Change in the number of students receiving education loans and scholarships from KYK (2009, 2014 and 2019)



Source: Prepared using MEB Statistics published in various years and the activity report of the Ministry of Youth and Sports.

Figure F.4.2 shows the change in the total amount of education loans and scholarships given by the KYK according to the type of aid for 2009, 2014 and 2019. While the number of students receiving education credits from the KYK in higher education in 2009 was 587,131, this number increased to 865,309 in 2014 and to 1,159,828 in 2019. When the number of students receiving scholarships from KYK in higher education is examined, we can see that it was 198.707 in 2009. This number increased to 359.583 in 2014 and to 402.364 in 2019. In the 2018-2019 academic year, the number of associate, undergraduate and graduate students within the scope of face-to-face education in higher education is 3,777,114. 31% of these students received education loans from the KYK and 11% received scholarship support. Although the number of students receiving education loans has increased significantly in recent years, the number of students receiving scholarships has not increased significantly. The KYK provides a monthly scholarship or loan of 550 TL for associate and undergraduate students, 1,100 TL for graduate students and 1,650 TL for doctoral students.

In general, there are no fees in state higher education institutions in Turkey. The same is the case for some European countries. Among OECD countries, the average amount of student loans or scholarships for students ranges from $ 2,400 per year in Latvia to over $ 10,000 in the UK and Norway - where education is free and loans cover students' living expenses. Scholarships or grants received by students range from under one thousand dollars a year in Estonia and Slovakia, and over 7 thousand dollars in Australia, Austria, Denmark, Switzerland and the USA. In addition, in Australia, Denmark, New Zealand, Norway and Sweden, at least 80% of national students receive public financial support in the form of student loans, scholarships or grants (OECD, 2020). The student scholarship and education loan rate in Turkey is 42% according to data from 2019.

CHAPTER F CONCLUSIONS AND RECOMMENDATIONS

- Spending per student in Turkey is well below the OECD average. In order for Turkey to reach the OECD , the expenditure per student in the country would need to be raised from 35.41 billion TL to 59.55 billion TL in 2019 prices.

- The share allocated from the central government budget to the higher education budget is decreasing every year, and the proportion of capital expenditures in the higher education budget has also decreased. Considering Turkey' higher education system as a whole, we can see that it is still a growing sector when compared to other OECD countries. This is because higher education gained popularization in Turkey at a later date than it did in other OECD countries (Ozer, lush and Küçükcan, 2011). The number of relatively new higher education institutions and the youth population highlights the need for growth in the higher education sector (see Section A). Thus, Turkey is in need of higher capital expenditures in higher education. The budget allocated for higher education should be increased, taking into account the investment expenditure needs of both the divided universities and the (third wave) universities established in 2006 and onwards.

- Turkey has a lower higher education schooling rate than the average for OECD countries. Furthermore, there is a stagnant trend in the number of higher education students who receive scholarships. In order to ensure equal opportunities in the higher education sector, the number of students receiving scholarships should be increased.

CHAPTER F

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CHAPTER G

ACADEMIC AND INNOVATION PERFORMANCE OF UNIVERSITIES

This section will firstly present data on Turkey's performance in terms of academic publications. Then, the country's performance in terms of international scientific journals will be surveyed. Finally, Turkey's human resources with regards to Research and Development (R&D) will be analyzed followed by an assessment of the country's patent status.

INDICATOR G1

WHAT IS THE STATE OF TURKEY'S INTERNATIONAL ACADEMIC PUBLICATION PERFORMANCE?

This indicator will examine Turkey's international publications and reveal the performance of international academic journals indexed by Scopus using data derived from the Web of Science database.

Table G.1.1 Number of international publications in Turkey according to Scopus data (2010-2019)

Year	Number of Publications	Number of Citations	Self-Citation	Citations Per Document	International Cooperation Share (%)	World Share (%)
2010	33,357	439,997	97,524	13.19	16.71	1.35
2011	34,964	417,479	93,772	11.94	17.15	1.33
2012	36,829	420,696	89,135	11.42	19.15	1.34
2013	40,416	391,393	86,988	9.68	19.36	1.42
2014	41,420	362,575	77,466	8.75	19.48	1.43
2015	44,550	342,776	67,975	7.69	20.35	1.55
2016	47,473	288,782	59,339	6.08	21.65	1.60
2017	44,975	191,237	42,439	4.25	23.14	1.45
2018	45,691	108,848	27,029	2.38	24.41	1.47
2019	49,930	29,044	8,897	0.58	24.96	1.47

Source: October 2020 SCIMAGO (2020) data.

Table G.1.1 and Table G.1.2 show the number of international publications in Turkey between the years 2010-2019 according to Scopus and Web of Science data. According to data from Scopus and Web of Science, Turkey has had an increase in the number of publications between 2010-2016 but has experienced a decline in 2017. According to Scopus, it reached the 2016 level in 2019, and according to Web of Science, it reached the 2016 level in 2018. According to Scopus, Turkey's share in the world of international publications has gone form 1.35% in 2010 to 1.60% in 2016. However, this level was between 1.45 and 1.47% between 2017-2019. This data shows that Turkey's international academic publications production number has been stagnant, btu is increasing again. However, when viewed in terms of its share in the world, Turkey's international academic publication share has decreased. This means that other countries have increased their number of publications at a higher rate (see G1.1.4).

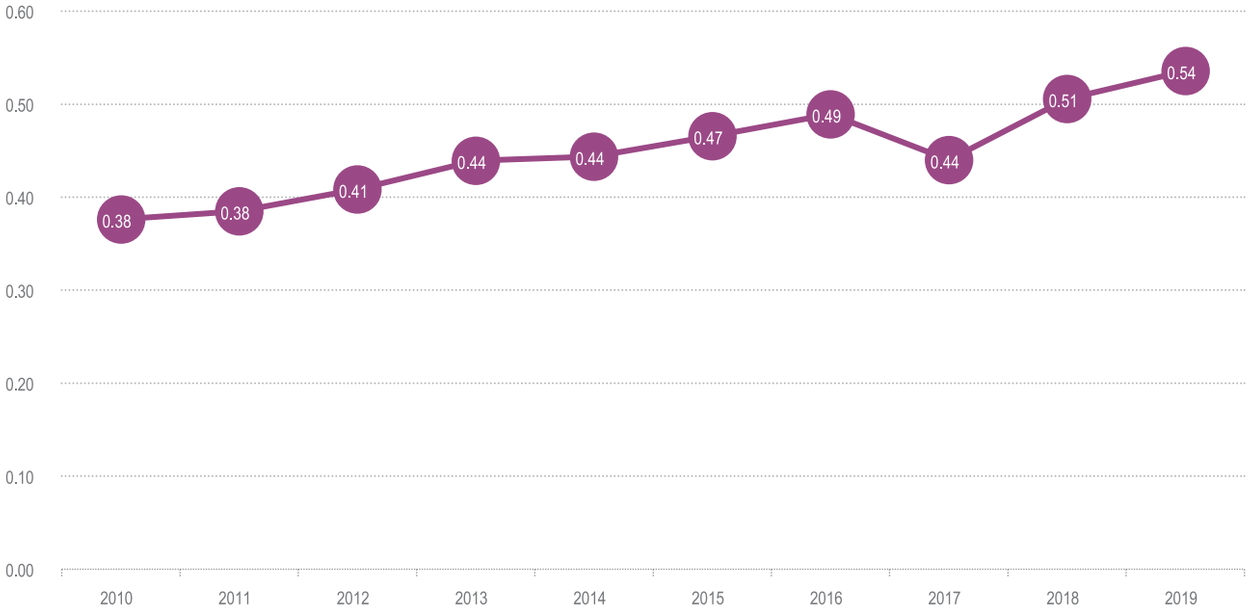
Table G.1.2 Number of international publications in Turkey according to Web of Science (2010-2019)

Year	Number of Publications	Number of Articles
2010	27,739	22,603
2011	28,768	23,394
2012	30,884	25,055
2013	33,679	26,295
2014	34,461	26,935
2015	36,679	28,407
2016	39,047	30,501
2017	35,547	28,714
2018	41,471	30,203
2019	44,548	35,634

Source: Prepared using data from the Cahit Arf Information Center (2020) dated August 2020.

Data from Web of Science shows the number of publications per 1,000 people in Turkey between the years 2010-2019. The number of publications, which was 0.38 per thousand people in 2010, increased to 0.49 in 2016, then decreased to 0.44 in 2017 and became 0.54 in 2019. Overall, the number of publications, in spite of Turkey's rapidly growing population, shows only a slight increase. In order to better evaluate Turkey's publication numbers, we need to compare this data with that of other countries (Table G.1.4).

Figure G.1.3 Number of publications per thousand people in Turkey according to Web of Science data (2010-2019)



Source: Prepared using data from the Cahit Arf Information Center (2020) dated August 2020 and TURKSTAT (2020) data.

In Table G.1.4, the rankings of the countries according to the total number of publications according to Scopus data between the years 2016-2019 are given. In terms of the total number of publications, Turkey ranked 17th, 18th and 19th respectively between the years 2016-2019. In the same period, Russia moved up one place each year from 13th to 10th. Countries such as Poland, China, India and Iran have significantly increased the number of their publications and as of 2019 and moved one or two places ahead in their rankings. While Turkey has ranked higher in 2019, it has fallen behind in the ranking during 2016 and 2017. Thus, we can conclude that Turkey does not show a consistent trend in these rankings. As of 2019, China surpassed the United States of America (USA) for the first time in terms of the total number of international publications and ranked first in the world.

Table G.1.4 Ranking of countries according to the total number of international publications according to Scopus data (2016-2019)

2016		2017		2018		2019	
Country	Rank	Country	Rank	Country	Rank	Country	Rank
USA	1	USA	1	USA	1	China	1
China	2	China	2	China	2	USA	2
United Kingdom	3	United Kingdom	3	United Kingdom	3	United Kingdom	3
Germany	4	Germany	4	Germany	4	India	4
India	5	India	5	India	5	Germany	5
Japan	6	Japan	6	Japan	6	Japan	6
France	7	France	7	France	7	Italy	7
Italy	8	Italy	8	Italy	8	France	8
Canada	9	Canada	9	Canada	9	Canada	9
Australia	10	Australia	10	Australia	10	Russia	10
Spain	11	Spain	11	Russia	11	Australia	11
South Korea	12	Russia	12	Spain	12	Spain	12
Russia	13	South Korea	13	South Korea	13	South Korea	13
Brazil	14	Brazil	14	Brazil	14	Brazil	14
Netherlands	15	Netherlands	15	Netherlands	15	Iran	15
Iran	16	Iran	16	Iran	16	Netherlands	16
Turkey	**17**	Switzerland	17	Poland	17	Poland	17
Switzerland	18	Poland	18	Switzerland	18	**Turkey**	**18**
Poland	19	**Turkey**	**19**	**Turkey**	**19**	Switzerland	19
Sweden	20	Sweden	20	Sweden	20	Sweden	20
Taiwan	21	Taiwan	21	Taiwan	21	Indonesia	21
Belgium	22	Belgium	22	Belgium	22	Taiwan	22
Malaysia	23	Malaysia	23	Malaysia	23	Malaysia	23
Denmark	24	Denmark	24	Indonesia	24	Belgium	24
Austria	25	Austria	25	Denmark	25	Denmark	25
Portugal	26	Portugal	26	Austria	26	Portugal	26
Czech Republic	27	Czech Republic	27	Portugal	27	South Africa	27
Mexico	28	Mexico	28	Mexico	28	Austria	28
Norway	29	South Africa	29	South Africa	29	Saudi Arabia	29
South Africa	30	Norway	30	Czechia	30	Mexican	30

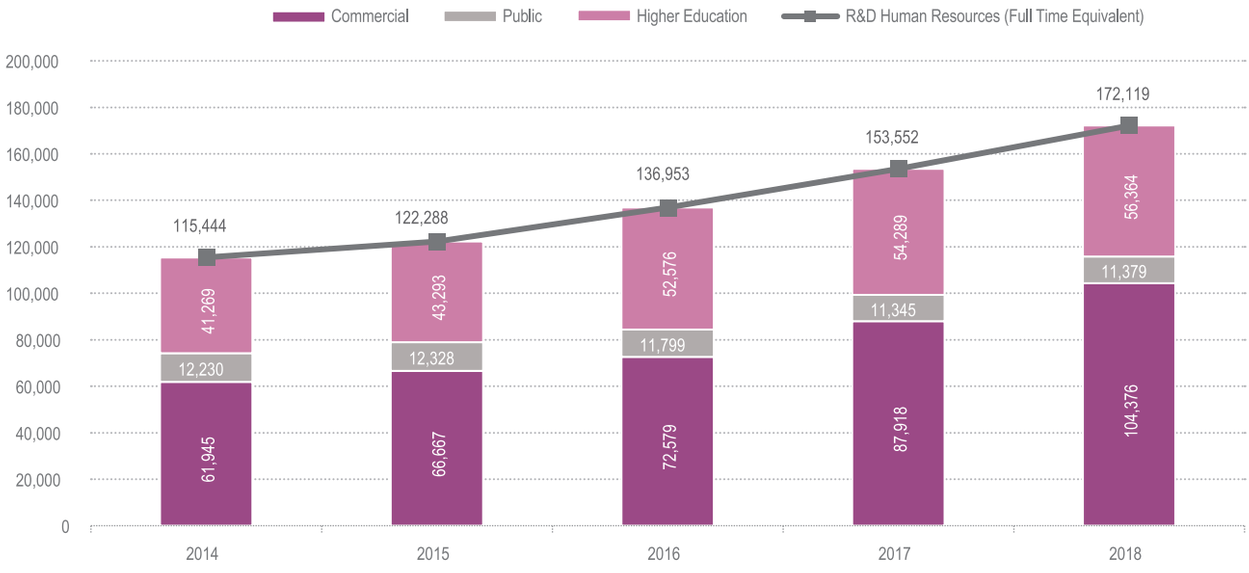
Source: SCIMAGO (2020).

INDICATOR G2

WHAT IS THE STATE OF TURKEY'S R&D HUMAN RESOURCES?

The human resources allocated to R&D activities are among the factors that affect the competitiveness and research performance of countries. In this chapter, Turkey's R & D staff over the years in terms of number of cases and making international comparisons have been examined.

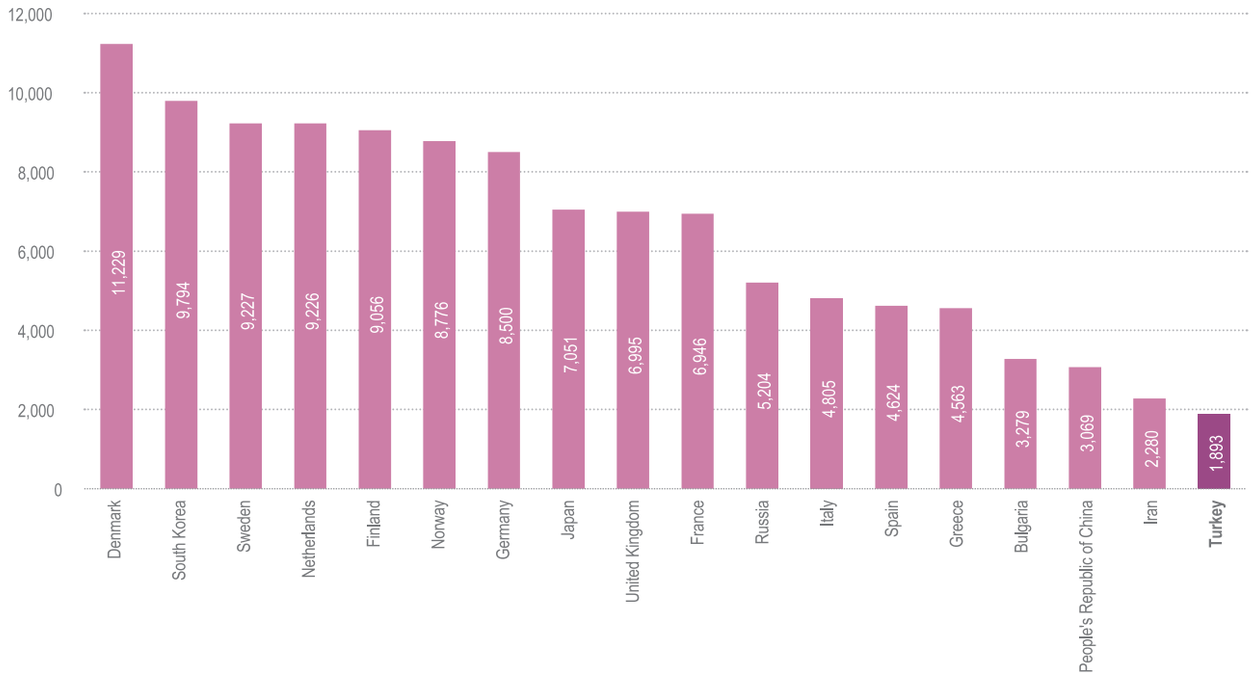
Figure G.2.1 Sectors in Turkey by the change in the number of R&D staff (2014-2018)



Source: Prepared using data from the TURSTAT (2019) Research and Development Activities Survey.
Note: R&D personnel data is calculated in terms of full time equivalent (FTE).

Figure G.2.1 shows the changes in R&D personnel by sector in Turkey between the years 2014-2018. In the given period, Turkey's R&D personnel has increased by 49%. As of 2018, 104 thousand of the total 172 thousand R&D personnel work in commercial institutions, 56 thousand in higher education institutions and the remaining 11 thousand in public institutions. To sum up, Turkey's R&D personnel number shows an increasing trend. Nonetheless, when we take into account Turkey's population and international examples, we see that this increase is still relatively low (see. Figure G.2.2).

Figure G.2.2 Number of R&D personnel per million people in selected countries (2018)



Source: Prepared using UNESCO (2020) UIS data.

Note: For countries without 2018 data, the most recent data available was used.

In Figure G.2.2, the number of R&D personnel per million people in selected countries according to 2018 data is given. The advantage of using the number of R&D personnel per million people instead of the number of R&D personnel is that it allows countries to make evaluations by considering their population size. From this perspective, the number of R&D personnel per million people is high in countries such as Denmark, South Korea, Sweden, the Netherlands, Finland, Norway, Germany and Japan. This means that R&D activities are strong in these countries. Countries such as China which have a larger population than Turkey have more R&D personnel per million people. This data shows that the ratio of R&D Activities in Turkey show compared to population density is relatively low.

INDICATOR G3

WHAT IS THE STATE OF TURKEY'S PATENT PERFORMANCE?

This indicator will examine Turkey's current state in terms of the number of patent applications. In this context, innovation performance of higher education institutions in Turkey were discussed. It cannot be said that the patent application numbers fully reflect scientific performance. However, considering that some patented inventions turn into products in the market and provide high economic returns, it is useful to evaluate the number of patents to understand the innovation performance of a country and higher education institutions.

Table G.3.1 Country rankings according to the total number of patent applications (2017 and 2018)

Rank	Country	Patent Applications (Direct) 2017	Patent Applications (Direct) 2018
1	China	1,301,293	1,457,705
2	USA	452,553	441,819
3	Japan	255,951	249,554
4	South Korea	167,527	171,753
5	Germany	61,474	60,871
6	Russia	26,045	27,798
7	India	20,209	22,367
8	United Kingdom	19,199	18,368
9	France	16,247	16,222
10	Hong Kong	13,299	15,986
11	Iran	16,259	12,823
12	Italy	9,674	9,821
13	Australia	9,008	9,057
14	Canada	7,672	7,765
15	**Turkey**	**8,196**	**7,251**
16	Brazil	7,390	6,846
17	Poland	3,998	4,269
18	Singapore	3,667	4,105
19	Mexico	4,520	3,787
20	Argentina	3,443	3,667

Source: Prepared using the WIPO (2020) statistics database (April 2020).
Note: PCT national phase inputs have been excluded.

Table G.3.1 provides country rankings according to the total number of patent applications for 2017 and 2018. China, USA, Japan, South Korea and Germany made the most patent applications in 2018. In 2016 a total of 6548 patent applications were made in Turkey. This number rose to 8196 in 2017, and to 7251 in 2018. Turkey ranked 14th in the world in 2017 in terms of number of patent applications, and 15th in 2018 (see also. Gür et al., 2019).

Table G.3.2 Number of PCT international patent applications by origin (2018 and 2019)

Rank	Origin Country	2018	2019
1	China	53,349	58,990
2	USA	56,252	57,840
3	Japan	49,706	52,660
4	Germany	19,883	19,353
5	South Korea	17,014	19,085
6	France	7,914	7,934
7	United Kingdom	5,641	5,786
8	Switzerland	4,568	4,610
9	Sweden	4,162	4,185
10	Netherlands	4,138	4,011
11	Italy	3,337	3,388
12	Canada	2,422	2,711
13	**Turkey**	**1,578**	**2,058**
14	India	2,013	2,053
15	Israel	1,898	2,006
16	Australia	1,825	1,768
17	Finland	1,836	1,655
18	Spain	1,409	1,513
19	Denmark	1,443	1,452
20	Austria	1,475	1,444
-	Other countries	10,912	11,298
-	Total	252,775	265,800

Source: Prepared using the WIPO (2020) statistics database (April 2020).

The numbers of PCT international patent applications by origin for 2018 and 2019 are given in Table G.3.2. The patent and Patent Cooperation Treaty (PCT) application numbers can be used as data to compare the innovation performance of countries. The PCT is an arrangement that allows the inventor to protect his invention in another country or countries (TÜRKPATENT, 2019). Thanks to the PCT, the inventor has the opportunity to prepare a search report, which is valid in all member countries and requested in patent applications. Thus, it is possible to take the invention under protection (patent) in the desired member countries in a fast and economical manner. According to Table F.5.2, the most PCT applications in 2018 were from China, the USA and Japan, respectively. Between 2018-2019, all three countries increased their PCT numbers, but China was the country with the highest increase, ahead of the United States in total. PCT applications originating from Turkey rose from 1,251 to between 2017-2018, and from 1,578 to 2,058 from 2018 to 2019 (see also. Gür et al., 2019). However, with these numbers, Turkey is still behind countries with smaller populations than itself such as Switzerland, Sweden, the Netherlands and Canada. Nonetheless, Turkey is ahead of India, whose population is much greater.

Table G.3.3 World rankings of selected institutions according to the number of PCT international patent applications (2019)

Rank 2019	Applicant Institution	Country	PCT Reference 2019
1	Huawei	China	4,411
2	Mitsubishi	Japan	2,661
3	Samsung	South Korea	2,334
4	Qualcomm	ABD	2,127
5	Oppo	China	1,927
6	BOE	China	1,864
7	Ericsson	Sweden	1,698
8	Ping An	China	1,691
9	Bosch	Germany	1,687
10	LG	South Korea	1,646
46	University of California	ABD	470
93	Tsinghua University	China	265
105	Shenzhen University	China	247
108	Massachusetts Institute of Technology	ABD	230
164	South China University of Technology	China	164
169	Texas University	ABD	161
188	Dalian University of Technology	China	141
191	Harvard University	ABD	140
200	Seoul National University	South Korea	136
207	Stanford University	ABD	132
100	Arçelik	Turkey	253
711	Sanovel Pharmaceutical Industry	Turkey	38
1020	Aselsan	Turkey	26
1343	Ford	Turkey	20
1343	Medipol University	Turkey	17
1491	Dokuz Eylül University	Turkey	15
1683	Turkcell	Turkey	15
1683	Montero Food	Turkey	15
1683	Eczacıbaşı	Turkey	15
1790	Yeditepe University	Turkey	14
1790	Tofaş	Turkey	14
2060	Atatürk University	Turkey	12
2246	Vestel	Turkey	11
2246	Sanko Textile	Turkey	11
2246	TUBITAK	Turkey	11
2448	Kordsa Technic	Turkey	10
2448	Kırpart Automotive	Turkey	10
2448	Hema Industry	Turkey	10

Source: Prepared using the WIPO (2020) statistics database (April 2020).

Note: For Turkey, only institutions with 10 and over applications have been included.

The world rankings of the institutions according to the number of PCT international patent applications for 2019 are given in Table G.3.3. In general, we can see that the most patents are filed by global electronics and automobile companies (Huawei, Mitsubishi, Samsung, Qualcomm). From the point of view of higher education institutions, American and Chinese universities (eg University of California, Tsinghua University, Shenzhen University, MIT) are institutions with the most patents. In Turkey, Arcelik, Sanovel, Military Electronics Industry (ASELSAN) and companies like Ford are institutions that have the most PCT applications. In terms of higher education institutions in Turkey, in 2017 only two universities filed patents. This number dropped to one in 2018 and rose to 4 universities with over 10 patent application in 2019 (see also. Gür et al., 2019). We can conclude that the number of universities with over 10 PCT application is quite low in Turkey.

CONCLUSIONS AND RECOMMENDATIONS

- There is great competition amongst countries in the fields of higher education and R&D because of the effects of investments in higher education and R&D on social welfare and economic growth. There is a general upward trend in the number of international publications and patents in Turkey.

- To compete in the international arena with Turkey's existing doctorate researchers and academics numbers is not possible. In order to develop Turkey's R&D capacity and international publications, it is essential to increase the number of researchers, and thus patents. In order to achieve this, it is necessary to increase the invectives on international publications and the average number of international publications of academic staff. Working conditions should be improved to encourage international researchers and academics working in Turkey.

CHAPTER G

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