

2 Patterns and trends in Portugal's higher education system

This chapter provides a broad overview of the main features and trends that characterise Portugal's higher education system, setting the context for the discussion in the subsequent chapters, which focuses on different aspects of higher education resourcing policy. The chapter starts with an overview of the higher education landscape in Portugal, before analysing current demand for higher education along socio-economic, demographic and territorial lines. The chapter then examines the effect of demographic and economic trends on projected future demand for higher education and advanced skills.

What is the scale and location of higher education provision in Portugal?

Portugal has a binary higher education system with multiple access pathways

Portugal has a broadly binary structure of higher education provision, with universities offering academically oriented education and a network of polytechnic institutes and schools providing professionally oriented education in fields as diverse as nursing, information technology, agronomy, teacher education, management and the visual and performing arts. As shown in Table 2.1, in the academic year 2020/21, there were a total of 36 public and 70 private higher education institutions (HEIs) in Portugal. Over 80% of students are enrolled in public-sector institutions, with just over 50% in public university programmes and around 30% in public polytechnic programmes. Of the 19% of students enrolled in private HEIs, a majority are enrolled in university programmes. The 47 private HEIs with polytechnic status, despite their number, collectively enrolled fewer than 6% of all students in Portugal in 2020/21. This review focuses primarily on the resourcing of Portugal's network of public universities and polytechnics.

Table 2.1. Number of HEIs in Portugal by type and share of enrolment (2020/21)

	University		University with polytechnic organic unit(s)			Polytechnic institute or school		Military and police training institutions**		Total	
	Number	Share of total enrolment	Number	Share of total enrolment*		Number	Share of total enrolment	Number	Share of total enrolment	Number	Share of total enrolment
				U	P						
Public	7	37.3%	7	13.2%	2.4%	20	28.2%	2	0.3%	36	81.4%
Private	22	10.2%	1	2.7%	0.2%	47	5.6%	0	-	70	18.7%
Total	29	47.3%	8	15.9%	2.6%	67	33.8%	2	0.3%	106	100.0%

Note: * U = University and P = Polytechnic. ** The two institutions (not covered by this review) are the Instituto Universitário Militar, which includes an organic unit offering technical education with polytechnic status, and the Instituto Superior de Ciências Policiais e Segurança Interna. Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

Most large HEIs are structured into administratively distinct faculties and schools with the legal status of “organic unit” (*unidade orgânica*), sometimes referred to in data collections as “educational establishments” (*estabelecimentos de ensino*). In 2020/21, the network of higher education institutions comprised 288 operational organic units¹. Seven public universities (as well as the Universidade Católica Portuguesa, Portugal's largest private university) have one or more organic units within their overarching structure offering professionally oriented polytechnic programmes. In most cases, these organic units were previously independent schools in areas such as nursing, technical engineering, education or design, which were integrated into the university structures over time. In all cases – and notably in the cases of the Universidade dos Açores, the Universidade da Madeira and the Universidade do Algarve – there is no public polytechnic institute in close proximity, meaning that the public universities are the main provider of “polytechnic” programmes in their respective regions.

Universities can confer bachelor's degrees (*licenciaturas*), second-cycle master's degrees (*mestrados*) and PhDs, following the Bologna cycles used in the European Higher Education Area. As in other European countries, longer, integrated master's degrees (*mestrados integrados*) are still offered in certain professional fields, such as medicine, pharmacy and architecture, with such programmes provided exclusively in universities². Polytechnics provide bachelor's and second-cycle master's programmes, as well as short-cycle Professional Higher Technical Programmes (TeSP) (Government of Portugal, 2018^[2]).

Box 2.1. Admission to public higher education institutions in Portugal

The main route for accessing undergraduate programmes in public universities and polytechnics in Portugal, the National Access Competition (CNA), is organised by the Directorate-General for Higher Education (DGES) at the end of each school year. Applicants must be holders of a secondary-school diploma or legally equivalent qualification; have obtained – within the previous four years – the minimum grades in the school-leaving exams required for the programmes for which they wish to apply; and fulfil other prerequisites for their chosen programmes, such as physical or linguistic ability.

Qualified candidates compete for study places (*vagas*) fixed annually by HEIs with approval from the DGES. This system of centrally co-ordinated *numerus clausus* may include specific conditions for public HEIs, such as study-place allocations for local students in the island regions of Portugal. The CNA has three successive phases. The first phase is open to candidates transitioning from upper secondary education (the “general” stream) and reserves spaces for candidates from island regions, Portuguese emigrant families, military personnel and those with disabilities. As a rule, candidates with the best secondary school-leaving exam marks are placed in the first phase and have the greatest chance of accessing their first choice of programme. The second phase allows candidates from the general stream, but narrows special groups to those with disabilities only, and the third and final phase allows applications from a single non-differentiated group.

Table 2.2. Access routes to public higher education institutions (2019/20)

	Number of entrants 2019/20	Share of new entrants 2019/20
General Access Regime	44 942	74.3%
<i>National Access Competition (CNA)</i>	44 242	73.2%
<i>Local competitions</i>	700	1.2%
Applicants over 23 years old	3 116	5.2%
Holders of higher education degrees	1 252	2.1%
Holders of Technological Specialisation (CET) certificates	132	0.2%
Holders of short-cycle qualifications (TeSP)	1 445	2.4%
Other forms of access	6 288	10.4%
Change of institution / programme	3 305	5.5%
Total	60 480	100.0%

Note: Technological Specialisation (CET) programmes have been superseded by Professional Higher Technical Programmes (TeSP).

Source: DGEEC (2022^[3]) *Dados e Estatísticas de Cursos Superiores (Data and statistics on higher education programmes)* <https://infocursos.medu.pt/bds.asp> (accessed on 10 July 2022).

At institutional level, “local competitions” are used for programmes in the visual and performing arts and “special competitions” in a range of situations, including for international students, candidates older than 23, candidates with a post-secondary professional diploma (CET or TeSP) or, since 2020, applicants with an upper-secondary vocational diploma – see Table 2.2. Admission to second and third cycle programmes is determined by HEIs themselves.

Source: DGES (2022^[4]), *Informação Geral – Concurso Nacional de Acesso (General Information – National Access Competition)*, https://www.dges.gov.pt/pt/formas_de_acesso (accessed on 21 January 2022).

The admission process for individuals wishing to access higher education in Portugal depends on the situation and age of the applicants, the status of the institution to which they are applying, and the type of programme they wish to follow. Private higher education institutions are responsible for organising

admission procedures for their programmes through institutional-level selection processes (“institutional competitions”). For public institutions, as detailed in Box 2.1, the main access route for undergraduate programmes is the National Access Competition (CNA), organised centrally by the Directorate-General for Higher Education (DGES), taking into account students’ results in secondary-school leaving examinations in the fields required for the programme they wish to follow (for example, in mathematics, Portuguese or foreign languages). In 2019/20, 73% of new entrants to public higher education institutions were placed based on their preferences and examination results in one of the three phases of the National Access Competition. The remainder of new entrants entered through a range of access routes organised at institutional level, including specific routes for accessing TeSP programmes and for those aged over 23 (see Table 2.2). Since 2020, following a recommendation from a previous OECD review (OECD, 2019^[5]), Portugal’s government introduced specific competitions for students graduating from vocational secondary programmes³, allowing them to access a specific set of undergraduate programmes (Government of Portugal, 2020^[6]).

Universities are structured into larger organic units than polytechnics

The largest organic units in Portugal’s higher education system, in terms of student enrolment, are in public universities, while the smallest are in private polytechnics. Universities enrol a majority of students (63%), but account for only around two-fifths of organic units (Table 2.3). The average number of students per organic unit in public universities (2 621 students) is more than double the equivalent ratio in private universities (1 294). While the scale of public polytechnics is similar to that of private universities (1 242 students per organic unit, on average), private polytechnics operate at a much smaller scale than any other type of institution, with 396 students per organic unit, on average.

Table 2.3. Enrolment in higher education establishments in Portugal (2020/21)

	University			Polytechnic			Total		
	Organic units	Enrolment	Share in enrolment (%)	Organic units	Enrolment	Share in enrolment (%)	Organic units	Enrolment	Share in enrolment (%)
Public	79	207 064	50.3	102	126 640	30.7	187	335 139	81
Private	41	53 072	12.9	60	23 784	5.8	101	76 856	19
Total	120	260 136	63.2	162	150 424	36.5	288	411 995	100

Note: Not including military and police training institutions (with six organic units and 1 435 students), which are not covered in this review.

Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

Enrolment is at record levels thanks to the expansion of public HEIs

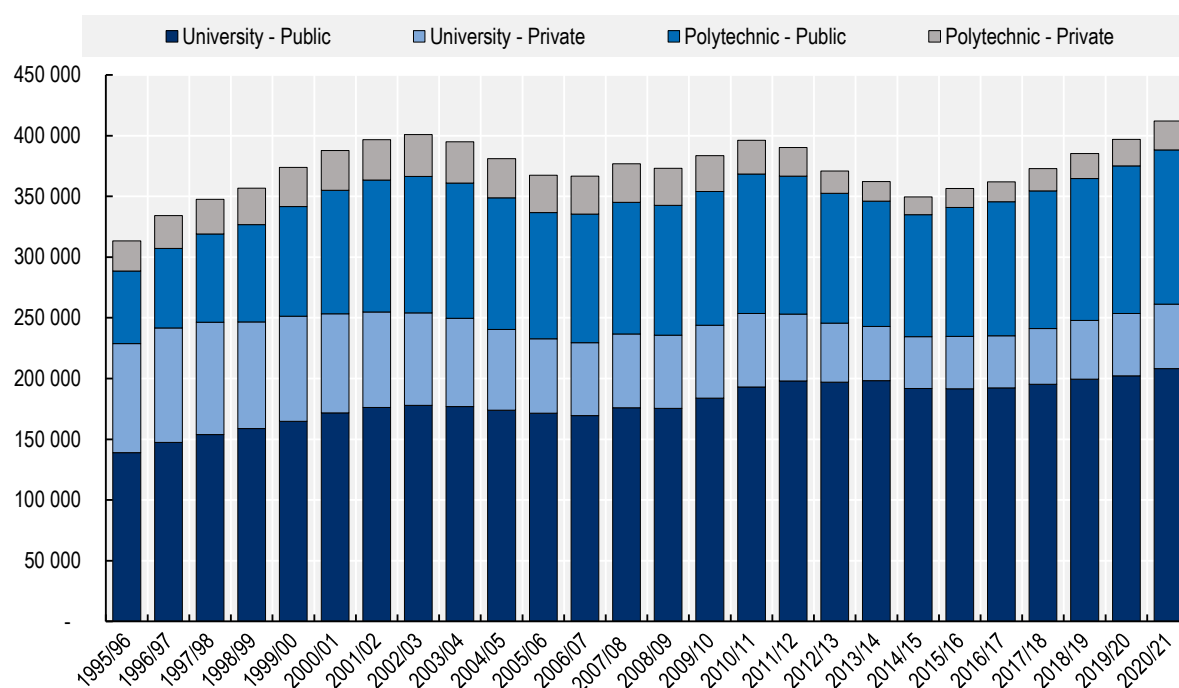
Enrolment in higher education in Portugal reached its highest ever level in 2020/21, with 411 995 enrolled students. This equated to 392 464 full-time-equivalent (FTE) students and marked a 15% increase from 358 450 in 2014/15 (see Figure 2.1). Enrolment was cyclical over the 25 years between 1996 and 2021, reaching peaks after economic downturns in 2002/03, 2007/08 and 2010/11 which, like the 2020/21 peak, followed economic recessions. The increase in enrolment in recent years has also been driven by the introduction of short-cycle Technological Specialisation Programmes (CET) and – from 2016 onwards – Professional Higher Technical Programmes (TeSPs), as well as the creation of specific admission routes to higher education for students aged over 23. Both these measures have attracted new student populations to higher education.

In absolute terms, enrolment growth between 2016 and 2021 was greatest in public institutions. While the increase in student numbers between 2016/17 and 2020/21 accrued to all types of institutions, enrolment

in private institutions grew slightly faster, leading to an increase of two percentage points in their share of total enrolment (from 16% in 2016/17 to 18% in 2020/21). However, this recent increase in the share of total enrolment in private institutions occurred against a backdrop of a long-term decline in the relative importance of private higher education in Portugal. The share of students enrolled in private institutions decreased from 37% in 1995/96 to 16% in 2016/17. Public institutions have consistently attracted over 80% of total enrolment since 2012/13. Between 2016/17 and 2020/21, public polytechnics accounted for half of the total increase in enrolment in higher education in Portugal: 20 238 out of the 40 995 additional students (DGEEC, 2021^[1]).

Figure 2.1. Enrolment in higher education establishment by type and status

Number of students including international students expressed in headcounts between 1995/96 to 2020/21



Note: Includes students enrolled in programmes provided by higher education institutions, except those enrolled for preparing a dissertation or project work and those enrolled in specialisations that, cumulatively, do not amount to 60 European Credit Transfer and Accumulation System (ECTS) points or 300 contact teaching hours distributed in two teaching semesters and a final evaluation.

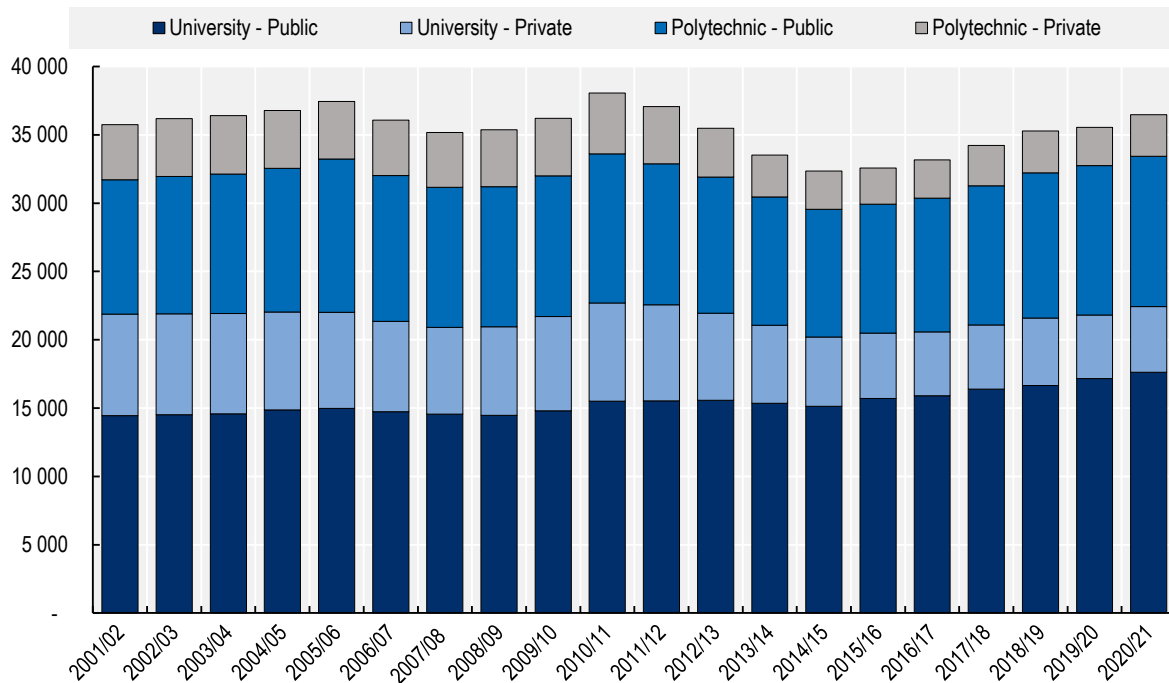
Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

StatLink  <https://stat.link/puw2bv>

In line with enrolment trends, only public higher education institutions have increased the number of academic staff they employ over the last decade (see Figure 2.2). In 2020/21, a total of 36 473 individual academic staff members, equating to 25 663 FTE posts, worked in higher education institutions across Portugal. This is roughly the same number as in the early 2000s. A net decrease of 1 591 individual academic staff between 2010/11 and 2020/21 resulted from contraction in private higher education institutions (where academic staff numbers fell by 3 795), compensated by a more limited expansion in public institutions (by 2 204). Academic staff numbers generally increased during periods of higher enrolment, although between 2015/16 and 2020/21 enrolment grew faster than the total number of academic staff (an increase of 17% for students, compared to 12% for staff).

Figure 2.2. Academic staff in higher education institutions by institution type

Number of academic staff (docentes) expressed in headcount between 2001/02-2020/21



Source: DGEEC (2021^[11]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

StatLink  <https://stat.link/48qarb>

An increasing number of international students come to study in Portugal, but the proportion of non-Portuguese academic staff is growing only slowly

In 2019, the share of international students within total enrolment in higher education in Portugal was in line with the (then) EU-28 average of 9% (Eurostat, 2022^[7]). This placed Portugal 17th out of 35 European countries for which data are available in terms of the share of international students, on a par with Belgium and France. The share of international students among enrolled students in Portugal increased by five percentage points between 2013 and 2019, the sixth-largest increase in the same group of 35 European countries. The increase in the share of international students in higher education programmes between 2013 and 2019 is likely to have been influenced by legislation adopted in 2014 that regulates the status of international students and makes it easier for them to access higher education (Government of Portugal, 2014^[8]). The share of international students enrolled in bachelor's programmes increased from 8.1% in 2014/15 to 13.1% 2019/20, while the increase in second-cycle master's programmes was from 15.2% to 27.5%.

In 2020/21, around 40% of international students (18 528 out of 47 072) were enrolled in bachelor's programmes and just under 40% in second-cycle and integrated master's programmes (18 133). Most international students (80%) attend public higher education institutions. Data at the organic unit level for 2019/20 show international students concentrated in 100 units (out of 288 in Portugal), 23 of which had at least a 20% share of foreign students. Among public institutions, the Instituto Politécnico de Bragança and the Instituto Politécnico da Guarda are notable in that international students represent, respectively, 38% and 34% of total enrolment in bachelor's and master's programmes.

Non-Portuguese academic staff still represent a comparatively small share of total academic staff in both public and private higher education institutions. In 2020/21, non-Portuguese staff represented only 3.8% and 4.5% of total academic staff in public and private institutions respectively. The share of international staff is larger and growing faster in universities (where the share increased from 3.7% to 5% between 2001/02 and 2020/21) than in polytechnics (where the increase was from 1.7% to 1.9% in the same period). Despite a fall of five percentage points in the share of foreign staff with Spanish nationality in the last five years, Spain is still the first country of origin of international academic staff in public institutions (19.2%), followed closely by Brazil (18.7%). The share of Brazilian academic staff in Portuguese higher education institutions increased by 10 percentage points between 2015/16 and 2020/21.

Public institutions in Lisbon and the North and Central regions, attract most students, while some programmes in interior and island regions operate below capacity

Much of the expansion in enrolment in higher education in the last decade has been concentrated in the North Region, while enrolment has decreased in absolute and relative terms in Alentejo, the Algarve and the Azores. The North Region was the location of 85% (13 254 out of 15 727) of additional enrolments in Portugal between 2010/11 and 2020/21. This represents five additional enrolments per 1 000 inhabitants in the region over that period (see Table 2.4). While the North Region concentrated one-third of enrolments in 2020/2021 – three percentage points more than a decade before – the Lisbon Metropolitan Area has consistently concentrated around 37% of enrolment. The Algarve experienced the largest decrease in enrolment rates between 2002/03 and 2020/21, with a decrease of 6.3 students per 1 000 inhabitants. Unlike other regions with declining enrolment rates, the change in the Algarve was the result of both an absolute decline in enrolment and an increase in population (the latter driven particularly by individuals retiring to the region).

Table 2.4. Enrolment and academic staff in higher education by region in Portugal

Region	Total enrolment (headcount)			Enrolment rate per 1 000 inhabitants			Academic staff (headcount)			Academic staff per 100 enrolled students		
	2002/03	2010/11	2020/21	2002/03	2010/11	2020/21	2002/03	2010/11	2020/21	2002/03	2010/11	2020/21
Lisbon Metropolitan Area	151 390	150 034	153 149	56.5	53.4	53.5	14 455	14 816	13 271	9.5	9.9	8.7
North Region	122 427	123 754	137 008	33.1	33.4	38.3	10 795	12 129	12 184	8.8	9.8	8.9
Central Region	87 501	85 749	88 169	37.2	36.7	39.8	7 319	7 611	7 785	8.4	8.9	8.8
Alentejo	21 441	18 410	17 640	27.6	24.2	25	1 831	1 596	1 572	8.5	8.7	8.9
The Algarve	11 331	10 896	9 613	28.3	24.4	21.9	1 077	1 209	983	9.5	11.1	10.2
Autonomous Region of Madeira	3 078	3 551	3 721	12.4	13.3	14.6	353	329	401	11.5	9.3	10.8
Autonomous Region of the Azores	3 663	3 874	2 695	15.1	15.7	11.1	361	374	277	9.9	9.7	10.3
Portugal	400 831	396 268	411 995	38.6	37.5	40	36 191	38 064	36 473	9.0	9.6	8.9

Note: Regions are Territorial Level (TL) 2 regions. Headcount data are used to illustrate trends, as data on full-time equivalent students and staff are available only from 2012/13 onwards.

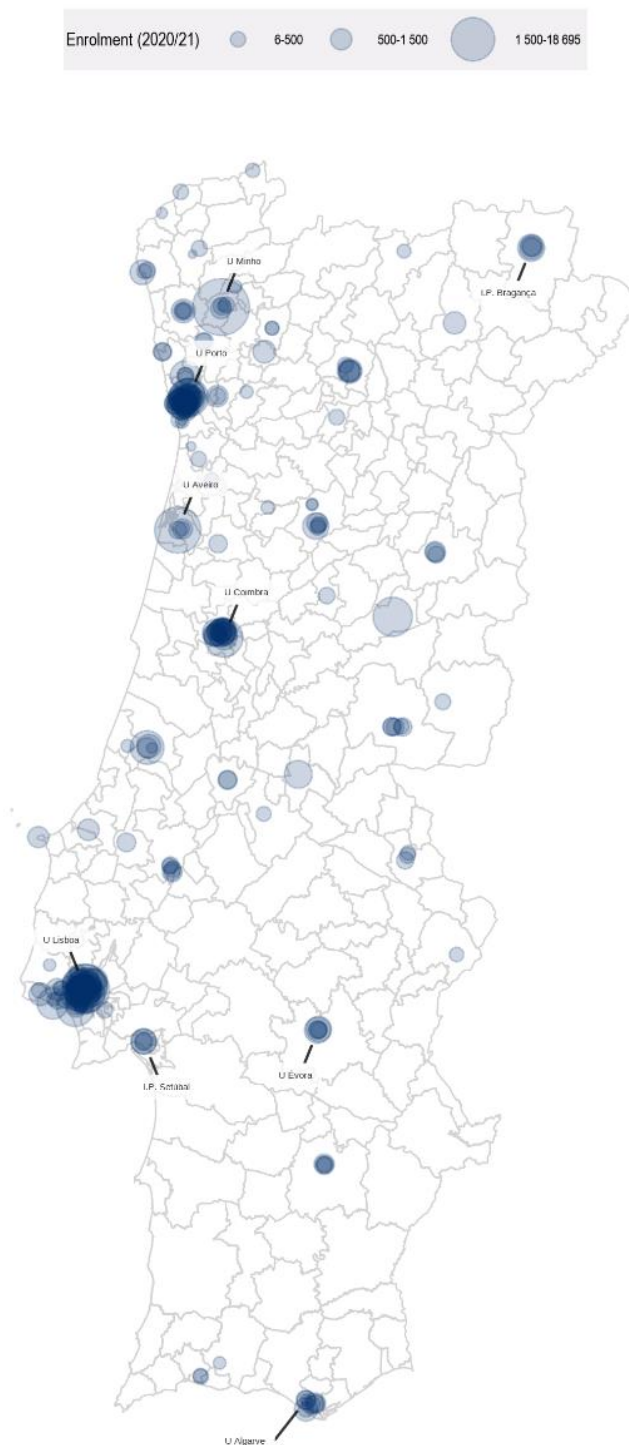
Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

As the number of academic staff generally increased more slowly than enrolment, the number of academic staff per every 100 students declined in the last decade across all regions of Portugal, except in the Azores and Madeira. The number of academic staff per 100 enrolled students is lowest in the Lisbon Metropolitan Area, the region with the highest total level of enrolment.

As shown in Figure 2.3, in 2020/21, 378 300 domestic higher education students, originating in 309 different municipalities in Portugal attended higher education campuses located in 62 municipalities across the country. Only 28 of the 62 municipalities that are home to a higher education campus have a positive net flow of students, meaning that more students move to the municipality to study than residents leave to study elsewhere (see Figure 2.4). At the municipal scale, Lisbon, Porto and Coimbra are the main nodes of higher education in Portugal. Lisbon, Porto and Coimbra account for, respectively, 30%, 15% and 9% of inflows, together receiving more than half of all students who move municipality to attend higher education.

As illustrated in Figure 2.5, student-flow data demonstrate that higher education institutions in the municipalities of Lisbon and Porto enrol a majority of their students from their local metropolitan areas (the core city and surrounding municipalities), while campuses outside Lisbon and Porto enrol a majority of their students from outside their local area. As an example, around three-quarters of students (74%) attending a higher education campus in the functional urban area (FUA) of Lisbon – which groups Lisbon municipality and surrounding suburban municipalities – come from the FUA of Lisbon. Furthermore, almost all students (93%) entering higher education who live in the FUA of Lisbon attend a higher education institution located in the same area. This level of both local attractiveness and relative homogeneity in places of origin is unique in the Portuguese context. Higher education institutions in the FUAs of Porto and Coimbra and the municipality of Bragança all attract around three-quarters of “local” students, but local students account, respectively, for only 58%, 42% and 33% of total higher education enrolment in these three areas.

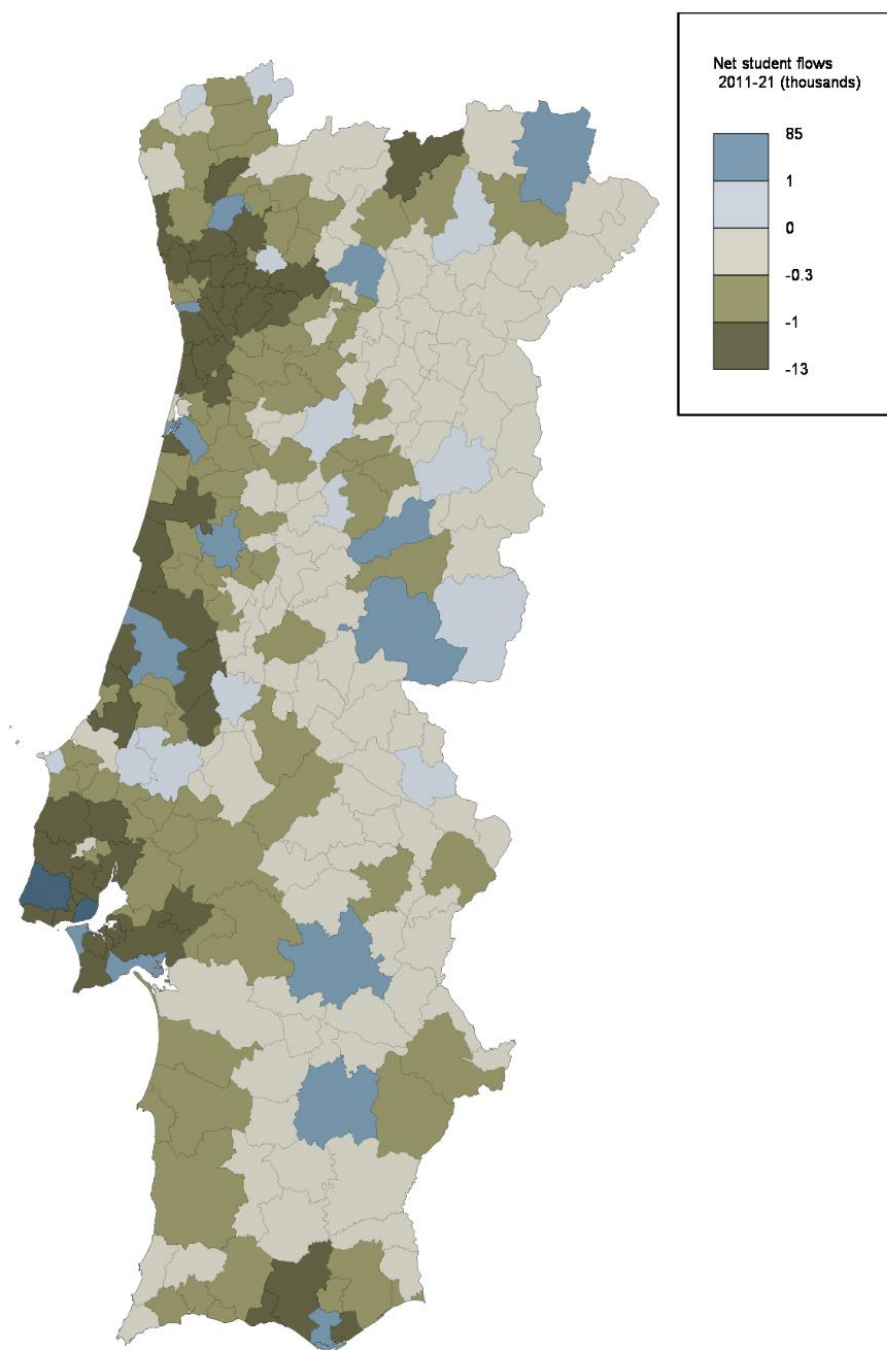
Figure 2.3. Enrolment by higher education campus in Portugal in 2020/21



Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021). Source of administrative boundaries: Agência para a Modernização Administrativa (2021^[9]) Portal de dados abertos da Administração Pública, accessible at: <https://dados.gov.pt/en/datasets/freguesias-de-portugal/> (accessed on 22 September 2021).

Figure 2.4. Net flows of students by municipality

Net flows of students (number of incoming students minus number of outgoing students) by municipality in mainland Portugal (2020/21)



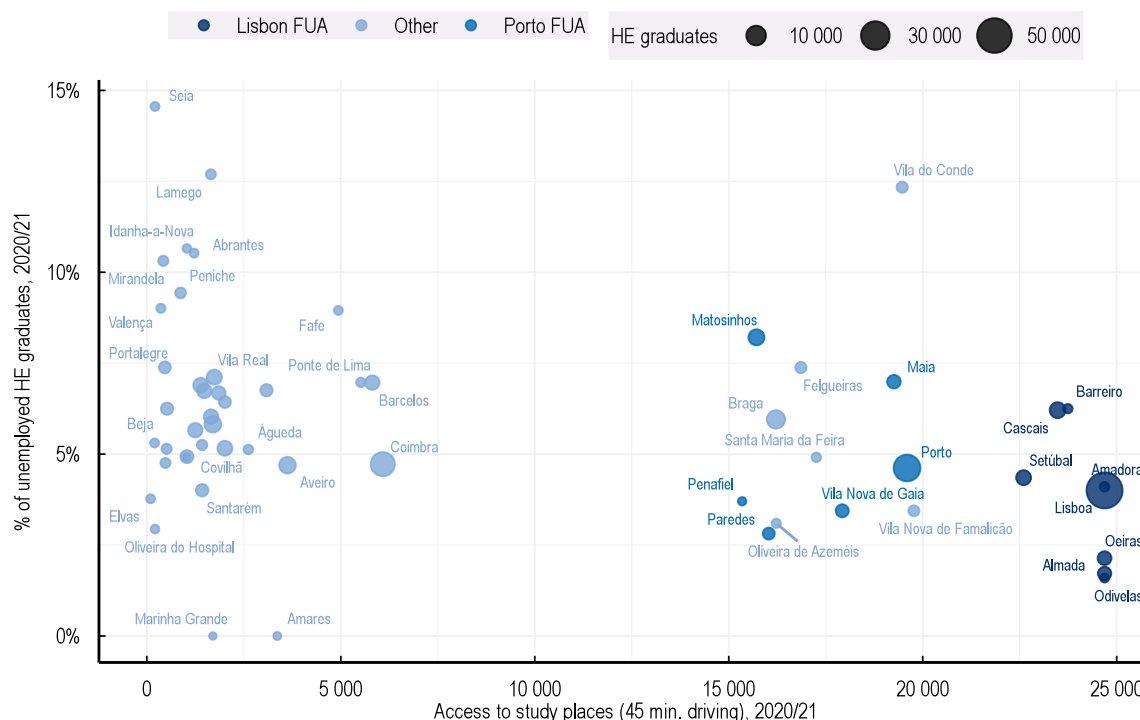
Note: Domestic students only.

Based on a matrix containing the number of enrolled students in higher education organic units by municipality of permanent residence. Permanent residence means the place where the student's household has lived for most of the time in the 12 months prior to the time of enrolment. Start (residency/home location) and end (organic unit/campus) locations defined by geographical centroids of municipal boundaries.

Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021). Source of administrative boundaries: Agência para a Modernização Administrativa (2021^[9]) Portal de dados abertos da Administração Pública, accessible at: <https://dados.gov.pt/en/datasets/freguesias-de-portugal/> (accessed on 22 September 2021).

Figure 2.5. Local attractiveness and diversity of origin of students across municipalities and FUAs

Data for 2020/21. Includes municipalities with at least one higher education campus



Note: Local attractiveness is defined as the share of students attending a higher education campus (organic unit) located in their place of residence. Diversity of origin is defined as the share of students coming from local areas as a proportion of the total number of students. FUA refers to functional urban areas.

Source: DGEEC (2021_[11]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021). Source of administrative boundaries: Agência para a Modernização Administrativa (2021_[9]) *Portal de dados abertos da Administração Pública*, accessible at: <https://dados.gov.pt/en/datasets/freguesias-de-portugal/> (accessed on 22 September 2021).

The number of study places offered in each region has not always evolved in line with enrolment and student demand in recent years. Higher education campuses in regions with declining numbers of prospective students of traditional student age (see below), including Alentejo and the Algarve, increased the number of study places they offered between 2018 and 2021 by 4%. In contrast, campuses located in regions with comparatively high student demand, such as the North and Central regions, increased the number of study places they offered by only 1% (DGES, 2021_[10]). Two polytechnics in interior regions with comparatively low student demand increased their study place offer by, respectively, 21% and 27% between 2018 and 2021 – double the rate of the Universidade do Porto, the fastest-expanding university, where the number of places increased by only 11%.

In Portugal, “occupancy rates” – the ratio between the number of first-time students enrolled in each programme through General Access Regime⁴ and the number of regulated study places available in that course – are frequently used as an indicator of student demand for a specific programme or institution in the public higher education system (DGEEC, 2022_[11]). As shown in Table 2.5, public universities generally fill in excess of the basic number of study places they have available through the General Access Regime (primarily the National Access Competition). The only exception is the Universidade dos Açores, which fills slightly under 100% of available study places in through this primary access route. The picture is more varied in the public polytechnic sector, where fewer institutions fill their study places through the General Access Regime, particularly in Alentejo and the Central Region. In contrast, public polytechnics in the

Lisbon Metropolitan Area and the Algarve enrol more students through the General Access Regime than the basic level of study places they have available. As can be seen in Table 2.5, occupancy rates in the private sector are significantly lower than in the public sector.

Table 2.5. Occupancy rates by sector of higher education and region

Occupancy rates (first-time students entering through the General Access Regime as a proportion of available regulated study places) for 2020/21 by TL2 region and sector of higher education

	Public university		Public polytechnic		Private university		Private polytechnic	
	Number of organic units	Occupancy rate (%)	Number of organic units	Occupancy rate (%)	Number of organic units	Occupancy rate (%)	Number of organic units	Occupancy rate (%)
North Region	19	107.7	29	91.3	21	79.1	31	55.1
Lisbon Metro Area	35	107.9	16	104.3	15	77.2	20	54.6
Central RegionI	12	101.7	32	86.7	4	61.5	4	27.7
Alentejo	4	101.6	14	76.4			1	15.2
The Algarve	4	115.9	5	104.1	1	34.1	1	59.7
The Azores	4	97.6	4	96.3				
Madeira	4	101.5	2	101.8			2	57.1
Portugal	82	106.1	102	91.3	41	76.2	59	55.1

Note: Occupancy rates are calculated as the ratio of students enrolled for the first time through the General Access Regime in initial cycles of higher education (bachelor's degree (*licenciatura 1.º ciclo*), integrated master's (*mestrado integrado*) and preparatory for integrated master's (*preparatórios de mestrado integrado*)) to study places (*vagas*) fixed through the numerus clausus system. Enrolment of students undertaking an international mobility period are not included. The data do not include enrolment in the Universidade Aberta (Open University) or the military and police training institutions.

Source: DGEEC (2022_[11]) *Estatísticas da Educação 2020/21 (Educational statistics 2020/21)*, <https://www.dgeec.mec.pt/np4/1372.html> (accessed on 15 July 2022).

Although occupancy rates – calculated in the way described above – do provide a valuable indicator of the attractiveness of higher education institutions and mainstream initial study programmes for traditional study groups, they must be interpreted with care. Crucially, occupancy rates do not take into account students accessing first-cycle higher education programmes through routes other than the General Access Regime and most notably the “special competitions” for international students, students over the age of 23, existing holders higher education qualifications, those changing courses, competitions for students in upper-secondary vocational education and certain additional “special regimes”. After students entering through these other access routes are taken into account, all but 10 of the 169 organic units in the regular public higher education sector fill at least 100% of the regulated study places they had on offer (variation may exist between programmes, with study places in some cases not 100% filled). Eight of the 10 organic units that filled less than 100% of the student places once all enrolments are taken into account were located in public polytechnics and one in each of the public universities located in island regions (Madeira and the Azores) (DGEEC, 2022_[11]).

Who participates in and completes higher education in Portugal?

The creation of new admission routes has increased opportunities to enter higher education

Higher education participation and attainment rates in Portugal have been increasing steadily over the last decade. The higher education attainment rate among those aged 30 to 34 in Portugal reached 43.7% in 2021, compared to only 27.8% in 2012 (Eurostat, 2022^[7]). Portugal now has a tertiary-education attainment rate among 30–34-year-olds above the average of the 27 European Union member states (41.6% in 2021), albeit still somewhat below the levels seen in parts of Northern Europe, the Netherlands, Switzerland and Ireland, where attainment rates now exceed 50% for the same age group.

The current admission process for accessing higher education in Portugal, outlined in the previous section, ensures that most candidates that apply to enter higher education are eventually admitted, despite a comparatively selective admission procedure. Over time, the introduction of new admission routes to higher education has helped to widen and diversify access to higher education. Procedures for applicants aged over 23 were introduced in 2006 and integrated into revised secondary legislation on access to higher education in 2014 (Government of Portugal, 2014^[12]), while more recent policies have aimed to increase participation in higher education among those graduating from the vocational tracks of upper secondary education (Government of Portugal, 2020^[6]). The proportion of international students has also increased steadily over the last decade. In 2019/20, largely as a result of these developments, only 73% of new students were admitted to undergraduate programmes through the National Access Competition, compared to 90% in 2012 (DGES, 2022^[4]).

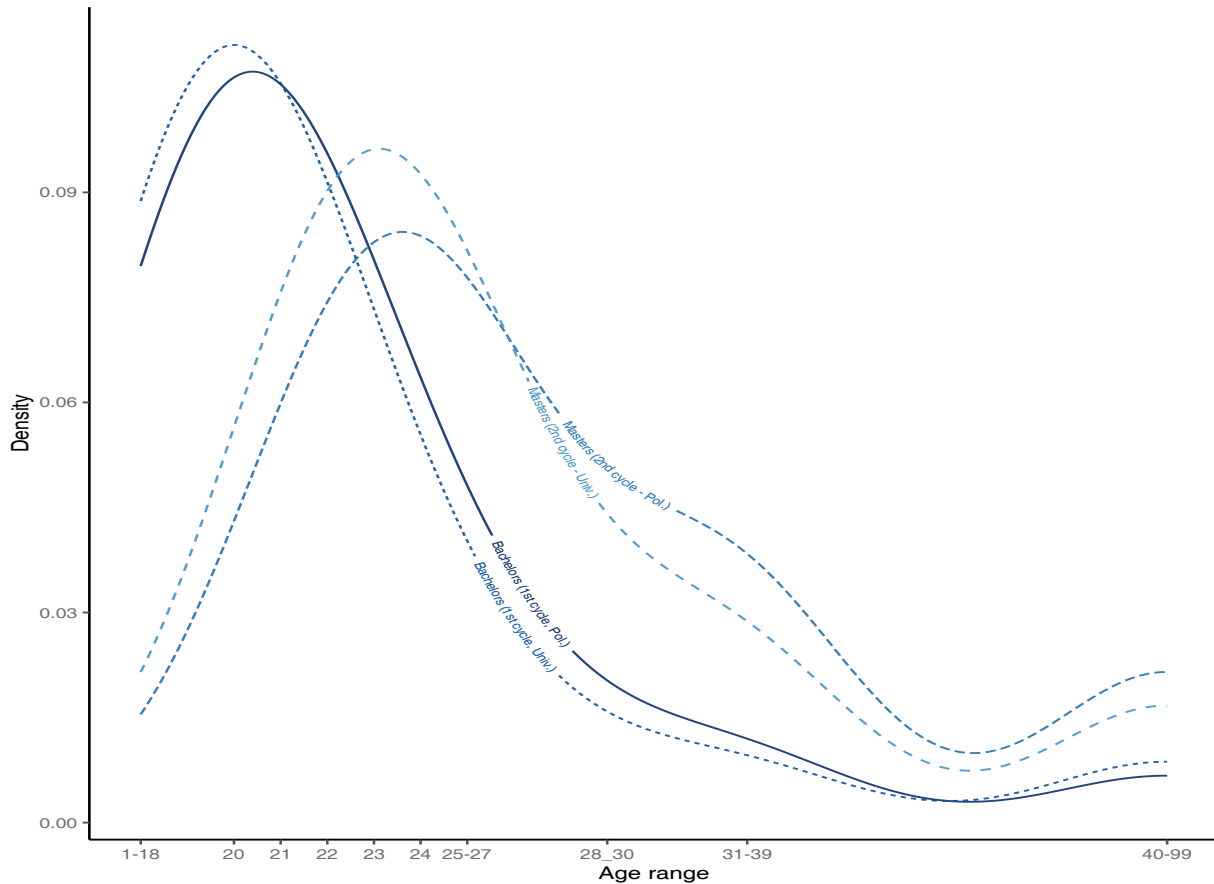
A majority of students enrolled in higher education in Portugal are aged between 20 and 25, although students enrolled in polytechnics have an older average age profile. National data show that 83% of domestic students enrolled in higher education in 2017/18 were younger than 30 and 74% were younger than 25. Data for 2021 show that about half (51.5%) of 20-year-olds in Portugal were enrolled in a higher education institution, compared to just over 40% in 2015. The government has set a target for 60% of 20-year-olds to be enrolled in higher education in 2030 (DGES, 2021^[13]).

The vast majority of students in higher education in Portugal are under 25

Although the entry regulations provide a specific pathway for older students to access to higher education, the share of enrolment in bachelor's programmes of students above 23 is still small, especially in public institutions (5.2% in 2019/20 – see Table 2.2). The share of first-time entrants to higher education aged below 25 in Portugal – as opposed to enrolled students aged below 25 – was 91% in 2020, compared to an OECD average of 83% (OECD, 2021^[14]). As illustrated in Figure 2.6, the probability of an individual being enrolled in higher education decreases sharply among those over 30 and increases slightly again after 40, as people in this older age group enrol in greater numbers in master's programmes. Students in polytechnics are on average older than those in universities, reflecting the wider range of offerings in polytechnics targeting the adult working population. In 2020/21, the share of master's students aged over 30 in polytechnics was 32%, compared to 23% in universities.

Enrolment of students combining study and work in Portugal's higher education system fluctuated around 30 000 in the period 2016/17 to 2020/21, reaching a maximum of 9% of total enrolment (33 271 students) before the COVID-19 pandemic in 2019/20. In 2020/21, working students were enrolled in 100 of the 288 organisational units in the country, nine of which with working students accounting for more than a quarter of total enrolment. Polytechnics concentrate the largest share of the offer of degree programmes offered through evening classes under the so-called “after-work regime” (*regime pós-laboral*).

Figure 2.6. Age of enrolment by type of degree in 2019/20



Note: Excludes students in integrated master's programmes (universities). "Density" refers in the vertical axis refers to the likelihood of an event happening – in this case a student being a certain age.

Source: Authors' elaboration based on DGEEC (2022^[3]), *Dados e Estatísticas de Cursos Superiores - Edição 2021 (Data and statistics on higher education programmes - 2021 Edition)* <https://infocursos.medu.pt/> (accessed on 14 January 2022).

Drop-out rates from undergraduate programmes in Portugal are comparatively high

Older students are more likely to drop out of their studies or take a longer-than-standard time to complete their programme than their younger counterparts. An analysis conducted in 2018 showed that only 46% of students in Portugal who started a – nominally three-year – bachelor's degree in 2011/12 had successfully completed the degree four years later (in 2014/15). 29% of all students had left their bachelor's programmes without graduating by the end of the four-year period analysed. Among students entering bachelor's degrees after secondary education through the National Access Competition, 51% had completed their programme four years later, and 21% had dropped out of higher education. Among students entering through the special competition for those aged over 23 in 2011/12, only 30% had graduated by 2015/16 and 50% had left the higher education system (DGEEC, 2018^[15]).

These patterns are confirmed in international data on completion rates in bachelor's degrees, the most recent of which at the time of writing dates from 2017. In OECD jurisdictions with available data, an average of 39% of students in bachelor's degrees completed their programmes within the theoretical duration (three or four years), with the proportion having successfully graduated rising to 67%, on average, three years after the end of the theoretical programme duration (i.e., six years later for three-year bachelor's programmes). In Portugal, the equivalent figures were respectively 30% of students completing within the

theoretical three-year duration of the programme and 65% having graduated after six years. The proportion of bachelor's students graduating "on time" in Portugal was around the same as in the Netherlands and Belgium – both countries with largely open access systems of higher education – but well below the proportions in Ireland and the United Kingdom (63% and 72% respectively) (OECD, 2019^[16])

Family background has a significant influence on participation in higher education

Individual-level data on the socio-economic characteristics of students could give a complete picture of the differences in the socio-economic profile of people accessing and graduating from higher education compared to society at large. However, such data are not readily available in Portugal. Moreover, it is not possible to discern the effect of socio-economic background on participation from aggregated entry and completion statistics as the applicant pool already reflects selection based on income and socio-economic background, with those from more advantaged backgrounds more likely to be in a position to apply. This report uses information available on the level of education of students' parents as a proxy for the socio-economic profile of students, acknowledging that the influence of differences in family background is more pronounced in basic education than in higher education (DGEEC, 2018^[15]; OECD, 2019^[17]).

As in other OECD countries, the socio-economic background of students affects their decisions to enter higher education in Portugal. PISA data from 2018 show that 25% of top-performing 15-year-olds from a disadvantaged socio-economic background in Portugal did not expect to complete higher education, compared to only 3% of top-performing students from advantaged backgrounds (OECD, 2019^[18]). Individuals whose parents have not attained tertiary education are under-represented among new entrants to bachelor's programmes in Portugal. In 2015, 61% of new entrants to bachelor's and integrated master's programmes did not have tertiary-educated parents, compared to 78% of 18–24-year-olds in the population at large. This disparity is larger in Portugal than in other OECD countries that have historically had low levels of tertiary attainment. Thus, in Chile 67% of tertiary entrants had parents without tertiary qualifications, compared to 70% of 18–24-year-olds overall, while the ratio was 71% to 82% in Italy (OECD, 2019^[17]). Whether or not students have tertiary-educated parents does not seem to influence on average the number of years it takes students to finish their degrees (DGEEC, 2018^[15]).

In Portugal, available data on completion of bachelor's degrees among students with different entry examination scores shows a positive correlation between scores and completion, with only 19% of students with the bottom scores on entry having graduated four years after starting their degree, compared to 58% of students with mean scores (DGEEC, 2018^[15]). Students who access higher education with lower scores in national entrance exams in Portugal are likely to have received lower quality basic education, which is, in turn, strongly correlated with lower socio-economic background.

The socio-economic status of parents influences the choice of upper-secondary programme, which influences participation in higher education, as students who choose a vocational upper-secondary pathway have a substantially lower probability of entering higher education. As in other OECD countries, students without a tertiary-educated parent in Portugal are more likely to follow a vocational upper-secondary pathway than a general one (OECD, 2021^[14]). In 2019/20, 81% of students that followed the general scientific-humanistic pathway had entered higher education within one year of completing secondary school, with 80% enrolled in bachelor's or integrated master's programme and 1% in a short-cycle TeSP programme. This compares to just 24% of students that followed a vocational pathway who enter higher education within one year of completing secondary school. Of the minority of vocational students that do enter higher education, half enrol in TeSP programmes. The proportion of graduates from the secondary vocational track of upper-secondary education and entering a bachelor's programme within one year doubled between 2018/19 and 2019/20 (12% compared to 6%) (DGEEC, 2021^[11]). This likely reflects the first effects of the new dedicated admission route to higher education for graduates from secondary vocational education that was launched in 2020, with the aim of further increasing transition rates into higher education among this population.

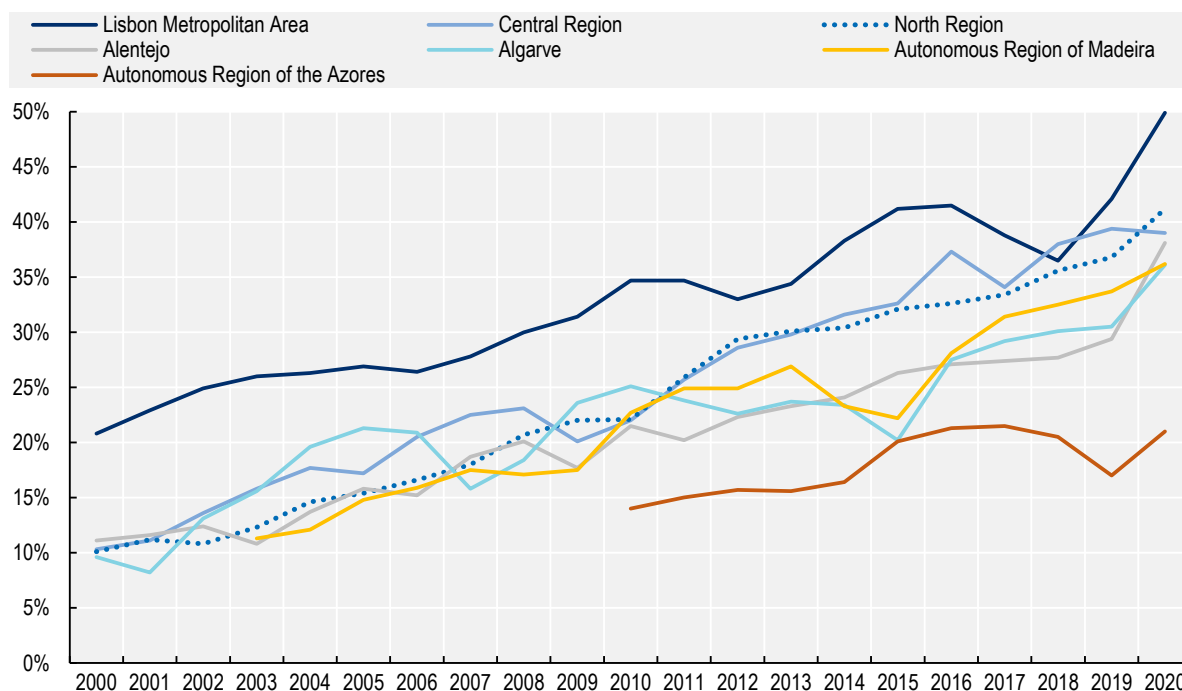
Regional location has less influence on individuals' chance of completing higher education in Portugal than in the past

In 2021, a total of 1.7 million individuals in the active population in Portugal held a higher education qualification (DGEEC, 2021^[11]). Older people and those living outside the metropolitan area of Lisbon are less likely to have obtained a tertiary-education qualification. In 2020, the share of adults aged 25-54 with tertiary education in Portugal, at 32.1%, was more than double the share among 55–74-year-olds (14.6%). The share of tertiary-educated adults in the Lisbon Metropolitan Area was 38% – 10 percentage points higher than the national average of 28%, and more than double the rate in the two regions with the lowest attainment rate: Alentejo and the Autonomous Regions of the Azores (16%).

Regional differences in tertiary attainment are, however, smaller among younger age cohorts, as the regional gap in attainment among 25–34-year-olds has consistently closed in the past two decades. As illustrated in Figure 2.7, tertiary education attainment rate data for 25–34-year-olds show smaller variation across Territorial Level (TL) 2 regions than for the adult population as a whole, ranging from 21% in the Azores to 50% in the Lisbon Metropolitan Area. While a rapid increase between 2000 and 2017 allowed lagging regions to catch up, the gap between the Lisbon Metropolitan Area and other regions increased again between 2017 and 2020.


Figure 2.7. Tertiary educational attainment rate by region in Portugal

Share of population aged 25-34 years with a tertiary-education qualification by Territorial Level 2 region, 2000-20



Note: Higher education includes International Standard Classification of Education (ISCED) levels 5-8.

Source: Eurostat (2022^[7]) Indicators, <https://ec.europa.eu/eurostat/databrowser/> (accessed on 20 January 2022).

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How will demographic trends affect demand for higher education?

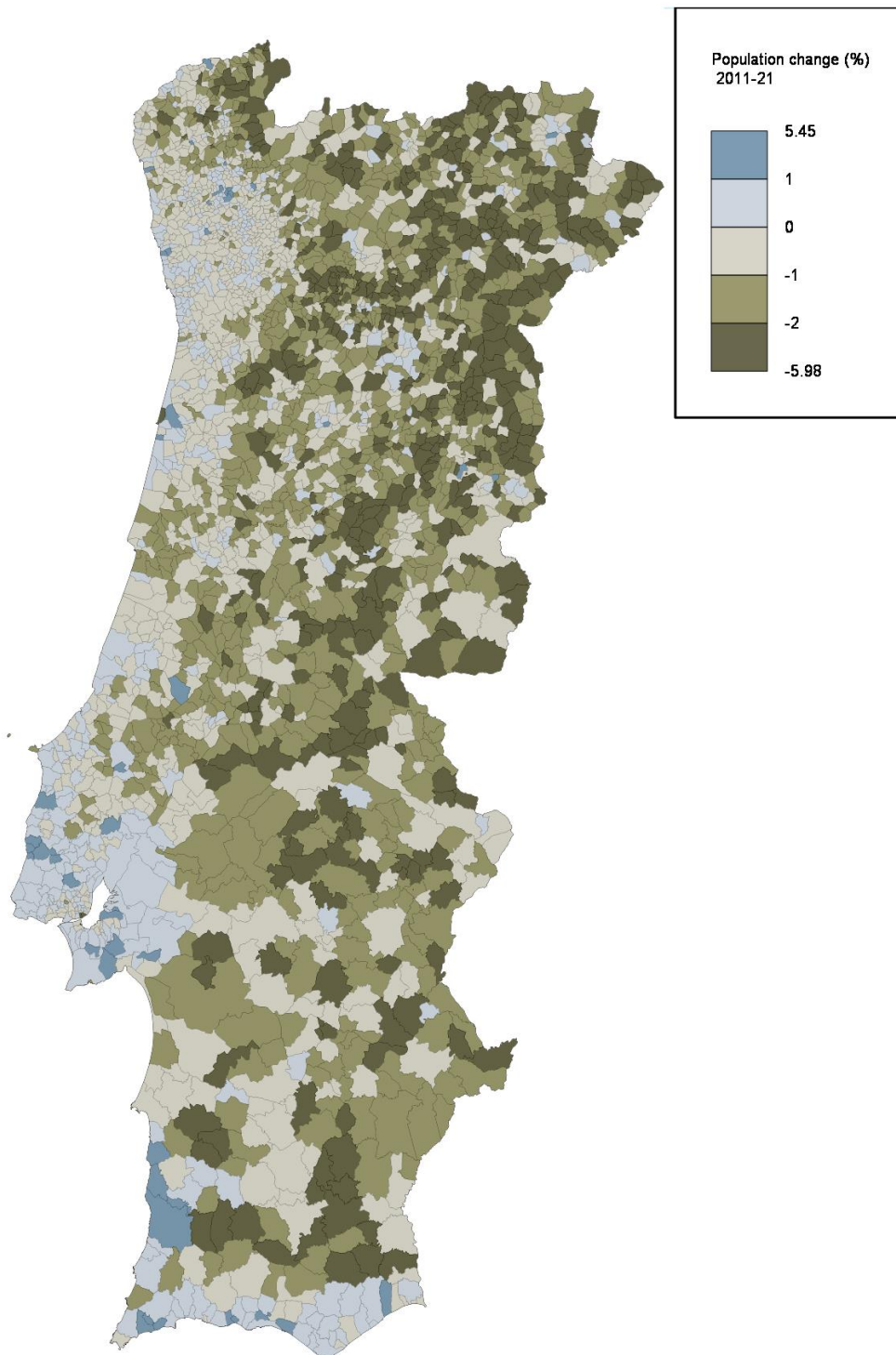
This section analyses how ongoing population trends will affect the future flow of students into higher education in Portugal. It first analyses concentration and suburbanisation trends and what they imply for demand for higher education in Portugal's interior regions. It then focuses on the effect of population ageing on the future demand for education and the effect of ageing on the availability of academic staff.

The population of interior regions is declining as a result of demographic ageing, while suburban areas in the littoral are growing

Preliminary census data for 2021 shows that the population of Portugal shrank at a rate of 0.17% annually between 2011 and 2021. All Portuguese TL2 regions, except the Lisbon Metropolitan Area and the Algarve, experienced population decline over the last decade. The fastest rates of decline were in Alentejo (- 0.72%), the Autonomous Region of Madeira (- 0.4%) and the Central Region (- 0.44%). Population decreases in the last decade were driven by natural population change (deaths exceeding births) that were not compensated for by positive migration trends. Emigration rates out of Portugal, which have historically been comparatively high, slowed substantially after 2015 (Statistics Portugal, 2021^[19]).

At a lower geographic scale, only 21% of parishes (*freguesias*) in mainland Portugal (680 out of 3 223), mostly in littoral and suburban areas, experienced population growth between 2011 and 2021. In parallel, 16% of parishes in mainland Portugal (513), most of them located in the interior of the country, experienced average annual population decreases of 2% or more in the same period (see Figure 2.8).

Figure 2.8. Annual population change rate by parish in mainland Portugal 2011-21



Note: Annual population change computed as compound annual growth.

Source: Authors' elaboration based on Statistics Portugal (2021^[20]). *Censo 2021: Resultados provisórios (Census 2021: Preliminary results)*, https://www.ine.pt/scripts/db_censos_2021.html (accessed on 22 September 2022).

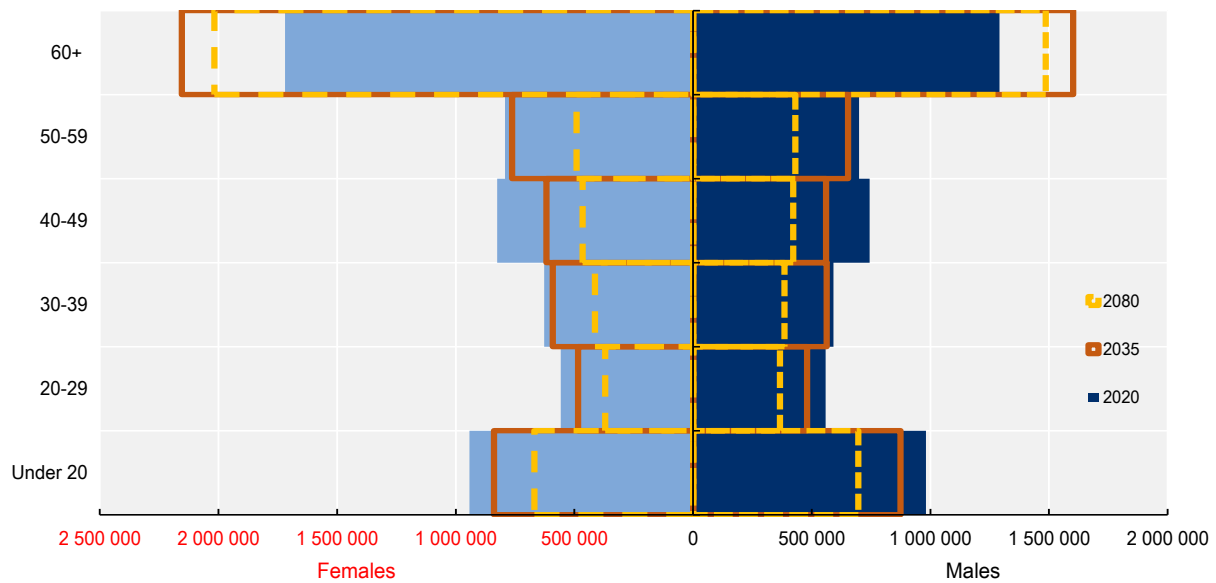
Despite population decline in interior regions, the share of the population living in cities and their commuting zones (functional urban areas - FUAs) in Portugal, at 57%, is smaller than the average of OECD countries (75%) and of EU member states (60%). Portugal also has a smaller concentration of its population (41%) in FUAs with more than 500 000 inhabitants, compared to the OECD average (60%) (OECD, 2020^[21]).

Population decline and the movement of people towards urban and suburban areas are expected to continue in the coming decades. Projections prepared by Statistics Portugal indicate that the population of Portugal will decrease from 10.3 million in 2020 to 10.2 million in 2035 (- 1.4%), 9.7 million in 2050 (- 6.6%) and 8.2 million in 2080 (- 20.5%) under a neutral (neither pessimistic nor optimistic) migration scenario (Statistics Portugal, 2020^[22]). Under a “low-migration” scenario, Statistics Portugal predicts that the Portuguese population could fall to 6.1 million in 2080 (Statistics Portugal, 2020^[23]).

Declining student numbers and an ageing academic workforce will be the norm in the coming decades

The population of Portugal is ageing at a faster pace than populations in most OECD countries. The share of population over 65 in 2020 was already 22%, about nine percentage points above the average of OECD countries (13%). As illustrated in Figure 2.9, the Statistics Portugal projections for 2035 and 2080 show that all age groups below 60 are projected to shrink in coming decades, while the population older than 60 is projected to increase. The population aged 20-29, which constitutes the bulk of traditional demand for higher education, will decrease in absolute terms by over 70 000 men (a 14% decrease) and 72 000 women (a 13% decrease) between 2020 and 2035, equating to a total decrease of 13.5% compared to 2020. Statistics Portugal projects that the population aged 20-29 will shrink by another 230 000 between 2035 and 2080, meaning a decline of over one-third in this age group between 2020 and 2080.

Figure 2.9. Age pyramid for Portugal in 2020, 2035 and 2080



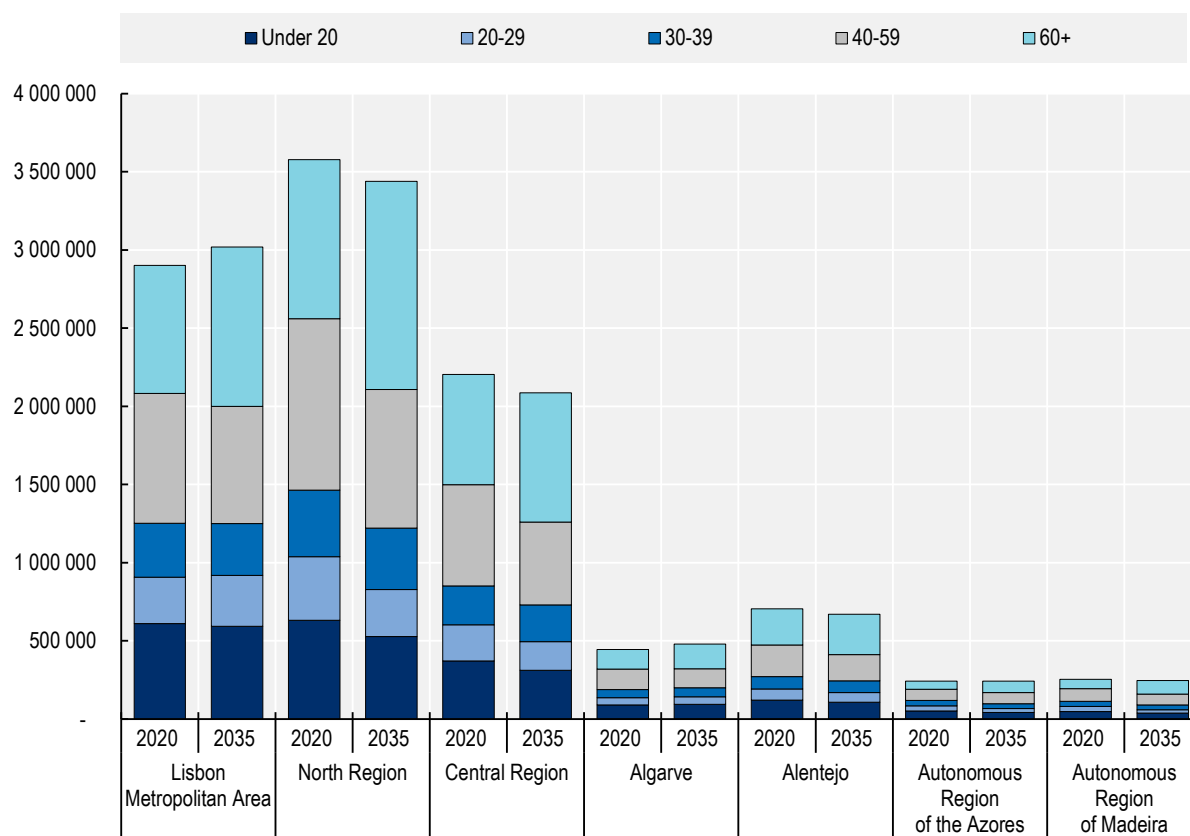
Note: Projections based on the “central” scenario of evolution for resident population which assumes: 1) a moderate recovery of future fertility levels for a Total Fertility Rate (TFR) of 1.59 children per woman in 2080 (up from 1.41 in 2018); 2) continuation of recent improvements in mortality and the pace of growth in life expectancy, with life expectancy at birth reaching 87.92 years for men and 93.30 years for women in 2080; and 3) continuation of trends in immigration and emigration, with the maintenance of positive annual international net migration over the projection period, reaching a net migration of 14 020 in 2080 (up from 11 570 in 2018).

Source: Statistics Portugal (2020^[22]) Resident population (projections 2018-2080) by Sex, Age and Scenario. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&indOcorrCod=0010035&contexto=bd&selTab=tab2 (accessed on 12 November 2021).

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As illustrated in Figure 2.10, patterns of population change will vary between the regions of Portugal. In the Lisbon Metropolitan Area, the population aged 20 to 29 is projected to increase by almost 10% between 2020 and 2035, while the increase in the Algarve is project to be almost 4%. In contrast, the population in this age cohort in all other regions of Portugal is projected to decline, with the decrease ranging from – 14% in Alentejo to – 26% in the North Region and more than – 30% in Madeira.

Figure 2.10. Population by age group and region in Portugal in 2020 and 2035



Note: Projections based on the “central” scenario of evolution for resident population which assumes: 1) a moderate recovery of future fertility levels for a Total Fertility Rate (TFR); 2) continuation of recent improvements in mortality and the pace of growth in life expectancy and 3) continuation of trends in immigration and emigration, with the maintenance of positive annual international net migration over the projection period.

Source: Statistics Portugal (2020_[22]) Resident population (projections 2018-2080) by Sex, Age and Scenario. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&indOcorrCod=0010035&contexto=bd&selTab=tab2 (accessed on 12 November 2021).

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These population trends will inevitably lead to a decline in the number of “traditional” higher education students in Portugal – young Portuguese residents who enter higher education in the years immediately after completing secondary education. This phenomenon will be particularly stark in the North Region, the nation’s most populous region. In contrast, demand for higher education among traditional age cohorts of local residents will continue to grow in the Lisbon Metropolitan Area.

Efforts to increase higher education participation among graduates of upper-secondary vocational tracks – and thus boost overall higher education participation and attainment rates – will only partially compensate a decline in the volume of students completing the scientific-humanistic upper-secondary track and transitioning to higher education. Upper-secondary vocational graduates are also likely primarily to enter short professionally oriented programmes adapted to their interests and needs, such as TeSPs, rather than established polytechnic bachelor’s programmes or academically oriented programmes in universities.

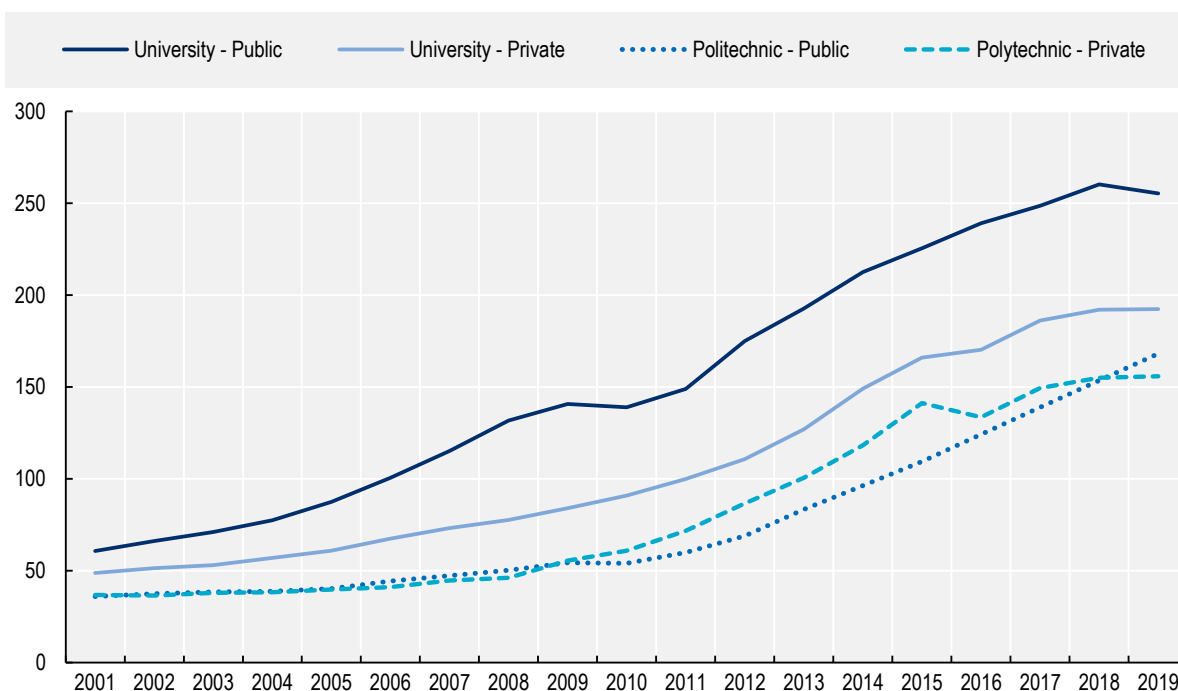
Actions to encourage adult populations to engage in upskilling and reskilling in higher education and attract more international students to Portugal are also likely to bring additional students into the higher education

system, although the scale of these additional inflows is not certain and – in the case of upskilling and reskilling at least – will also require new, more flexible educational offerings, adapted to the needs of new learner populations. This demographic context will create pressure to reduce the scale of higher education provision outside the Lisbon region in the decade to come.

The population of academic staff in Portugal's higher education institutions will also get older. As shown in Figure 2.11, the ageing index for academic staff – the number of academic staff aged 50 or more for every 100 academic staff aged 39 or less – has been increasing steadily over the last two decades. The ageing index reached its historical maximum at 193 on average across institution types in 2019. The ageing of academic staff is more prevalent in public universities, where the ageing index was 255 in 2019, than in public polytechnics, where the equivalent figure was 168.

Figure 2.11. Ageing index of academic staff by type

Ageing index is the number of academic staff aged 50 or more for every 100 academic staff aged 39 or less



Source: DGEEC (2021^[1]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

StatLink  <https://stat.link/s4b9ep>

How will economic trends affect future demand for advanced skills?

Higher education graduates in Portugal have generally good job and earnings prospects, although there is variation between level and field of study

A key reason many people choose to access higher education is to improve their job and income prospects. On average, higher education graduates in Portugal fare well in the labour market in comparison to their counterparts in many other OECD countries and residents of Portugal with lower levels of educational attainment. In 2020, the employment rate of higher education graduates in Portugal aged 25-64 was

87.9%, compared to an average for OECD member countries of 84.6% and employment rates in Portugal of 82% for upper-secondary graduates and only 70% for those without an upper-secondary qualification. For the age group that includes recent graduates – those aged 25-34 – the equivalent values were 84% for tertiary graduates in Portugal compared to 83% for tertiary graduates on average in the OECD and 82% and 73% respectively for those with and without upper secondary qualifications in Portugal (OECD, 2022^[24]).

OECD data show that young higher education graduates in Portugal (aged 25-34) have, on average, consistently earned around 50% more than those with upper-secondary or post-secondary, non-tertiary qualifications. This compares with an average earnings advantage in OECD countries of 36% and suggests there is sustained demand for higher education graduates and their skills in the Portuguese economy. Those with short-cycle qualifications in Portugal had an earnings advantage of around 10% compared with those with upper-secondary or post-secondary, non-tertiary qualifications in 2018, although this was before large numbers of graduates from the new TeSP programmes had entered the labour market (OECD, 2022^[24]).

As in other OECD countries, graduate labour market outcomes are influenced by cyclical economic and labour market conditions and the degree of alignment between skills supply and skills demand. The 2008 and 2011 economic crises took a toll on job creation in Portugal, with overall employment rates only returning to pre-crisis levels in 2020. Between 2008 and 2018, Portugal was one of few OECD countries where regional productivity, measured in terms of Gross Value Added (GVA) per employed person, improved. However, this occurred without significant job creation (OECD, 2020^[25]). Austerity policies that followed the financial crisis reduced opportunities for stable public-sector jobs that were traditionally accessed by higher education graduates, especially women (Suleman and Figueiredo, 2019^[26]). More recently, the unemployment rate in Portugal has been below the OECD average, even at its peak during the COVID crisis in May 2021 (8.1% in Portugal, compared to 8.8% on average in the OECD), although total youth unemployment (among 15-24 year-olds) remained among the highest in OECD countries, at 24.4% in mid-2021, compared to 19% before the pandemic (OECD, 2021^[27]). Unemployment among young people in Portugal is concentrated among those without – or with lower levels of – qualifications.

The proportion of recent higher education graduates (graduating between 2001 and 2020) registered as unemployed with the Institute for Employment and Vocational Training (IEFP) in December 2021 was 4.2%. These data do not take into account graduates who may be unemployed but are not registered with the national employment agency. Registered unemployment rates were lowest among recent graduates from private polytechnics (3.4%) and public universities (3.6%) and somewhat higher among graduates from public polytechnics (4.9%) and private universities (5.4%) (DGEEC, 2022^[28]).

Employment prospects for higher education graduates also differ by level and field of study. Employment rates among bachelor's graduates deteriorated more than for master's or doctoral graduates after the 2008 financial crisis (Alves, Morais and Chaves, 2017^[29]). Moreover, graduates from arts and humanities tend to face longer spells of unemployment, lower job stability and lower wages than graduates in fields such as health and law (Suleman and Figueiredo, 2019^[26]). Unemployment data in the second half of 2020 for recent graduates show considerable variation between programmes, with registered unemployment rates ranging from below 1% for nursing and medicine to over 10% for tourism and marketing-related degrees (DGEEC, 2022^[3]). Given these latest programme-level unemployment data are for a period during the COVID-19 pandemic, unemployment rates among graduates of tourism and hospitality programmes, in particular, must be interpreted with caution.

Demand for advanced skills in Portugal remains lower than in the most advanced OECD economies and is concentrated in certain regions

In Portugal, as in OECD countries more generally, digitalisation has resulted in the upskilling of job profiles. Nevertheless, high-tech jobs in Portugal still represent a relatively small share of all jobs and are highly

concentrated in the North Region and the Lisbon Metropolitan Area. In 2018, the sectors in Portugal with the highest shares in employment overall were distributive trade, repairs, transport, accommodation and food service activities (26%), and public, education and social services (20%), while high-tech services accounted for around 16% of employment⁵. The importance of manufacturing in terms of jobs and Gross Value Added decreased in all TL2 regions between 2000 and 2017 (OECD, 2020^[21]). Moreover, the share of high and medium-tech manufacturing jobs in Portugal, at 19.4%, was well below the European Union average of 37.9% in 2020.

Portugal concentrates a significant proportion of employment in sectors that require skills that can be automated. As a result, Portugal is among OECD countries that are estimated to have the highest risk of job automation over the next 10 to 20 years, with about one out of four jobs in the private sector at high risk of automation (OECD, 2021^[30]). Moreover, a majority of jobs in high-value-added services in 2018 were concentrated in the Lisbon Metropolitan Area (60% of jobs in information and communications technologies (ICT); 56% of jobs in financial and insurance activities, and 50% of jobs in professional, scientific, technical and support activities) and in the North Region (respectively 20%, 23% and 28% of employment in the same sectors). In line with these regional sectoral specialisations, the risk of automation is higher in regions with a smaller share of high-skill services, such as Alentejo, than in the Lisbon Metropolitan Area (OECD, 2021^[30]).

Analysis of current job vacancy adverts in May 2022, using data from Burning Glass, showed that advanced digital skills are in high demand in the Portuguese labour market. “Software programmer” was the job profile most frequently sought by employers in Portugal, while “systems analyst” and “ICT-support technicians” emerged as, respectively, the fourth and seventh most frequently sought profiles (Brighter Future, 2022^[31]). Other job profiles that certainly require some form of higher education qualification among the top-ten most sought-after job profiles in Portugal were human-resources specialists (fifth most frequent) and a broad category including biomedical, materials and security engineers (ninth most frequent). As is typical in many OECD countries, particularly in the period after the COVID-19 pandemic, the other most-sought-after job profiles in Portugal do not typically require higher education qualifications and include sales workers, waiters and bartenders and support staff in offices. For the latter category, however, changes to job profiles resulting from automation and digitalisation will mean a proportion of such roles are likely to require some form of post-secondary education.

Although a high proportion of high-skill employment is concentrated in the Lisbon Metropolitan Area and the North Region, all Portuguese regions have been improving their innovation standing in the European context. Portugal as a whole was ranked as a “Moderate Innovator” by the 2021 European Innovation Scoreboard, based on a range of indicators covering economic performance and structure, education, and research and innovation. Portugal’s main strengths, in an EU context, are its attractive research system and digitalisation and use of information technologies (European Commission, 2021^[32]). Across regions, the North Region, the Lisbon Metropolitan Area and the Central Region rank as “Moderate Innovators” and the remaining regions as “Emerging Innovators”. All regions improved their innovation performance compared to 2014 (European Commission, 2021^[33]).

The increases in innovation capacity, combined with increasing qualification levels among the population, provide a foundation to support more of the productive sector in Portugal to move into higher added-value areas of activity. Indeed recent economic analyses in Portugal, conducted in the wake of the COVID pandemic, argue that Portugal must maintain a strong focus on increasing skills levels and innovation capacity to attract foreign direct investment, allow the country to develop a high-value-added role in global value chains (notably in research and development (R&D) and design functions), promote business creation and increase productivity across the economy (Alexandre et al., 2021^[34]).

Portugal produces comparatively higher numbers of engineering graduates, but few ICT specialists

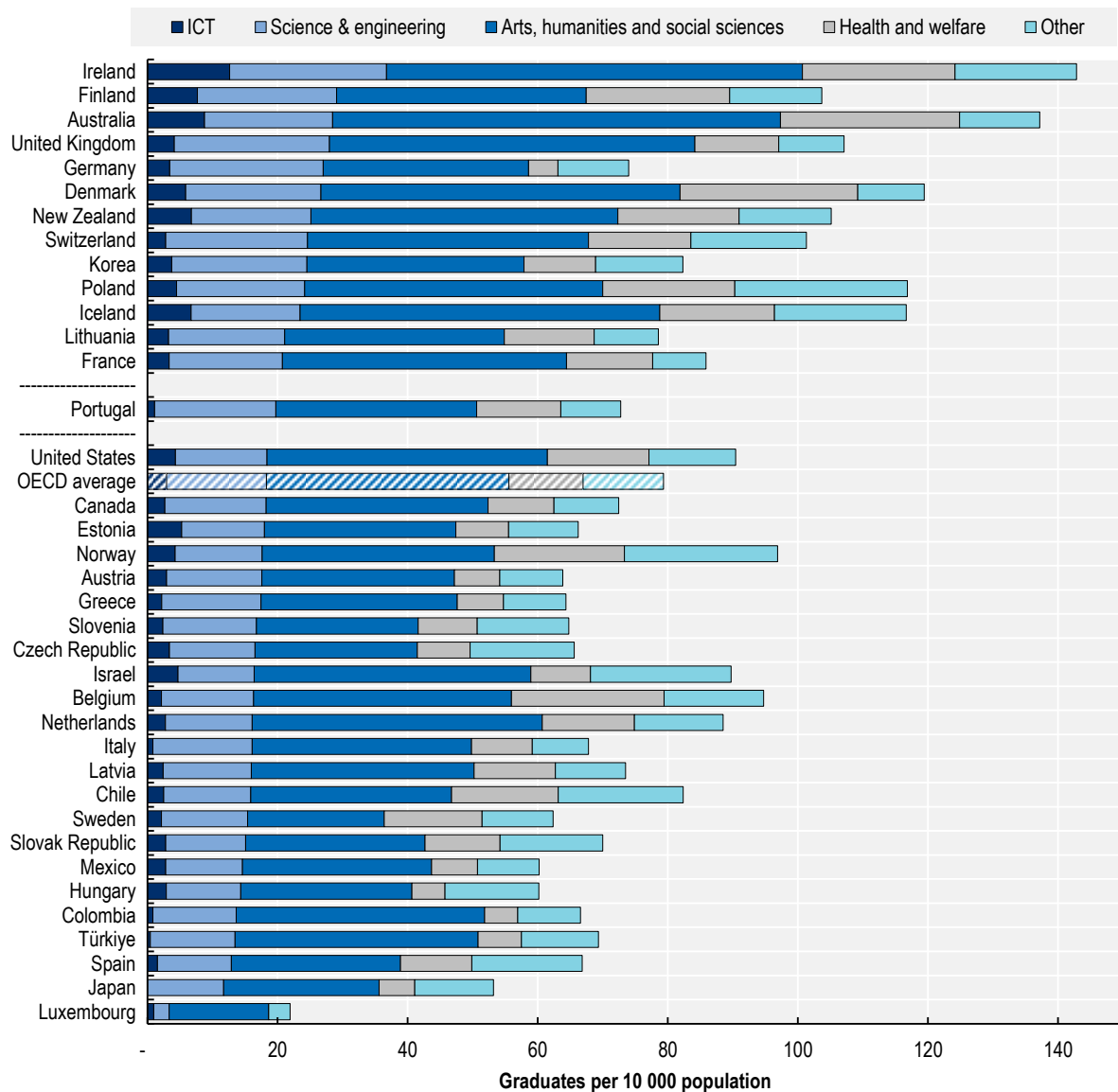
As noted, the expansion of Portugal's higher education system in recent decades has allowed the country to increase the proportion of younger age cohorts obtaining a degree to such an extent that tertiary attainment among those aged 30-34 exceeded the EU average for the first time in 2021. However, relative to the country's population, the number of students graduating each year in Portugal with a bachelor's or master's degree (over 90% of all higher education qualifications awarded in the country) remained slightly below the average of OECD countries. With 73 new bachelor's and master's graduates per 10 000 population in 2019, compared to an OECD average of 79, Portugal "produced" proportionally the same number of graduates at these qualification levels as Canada and Germany (respectively 72 and 74 new graduates per 10 000 inhabitants in 2019). In comparison, France graduated 86 students per 10 000 population from bachelor's and master's programmes in 2019, the Netherlands 88, Finland 104 and Ireland 143 – almost twice as many graduates in relative terms as in Portugal (OECD, 2022^[24]).

Apart from the capacity of higher education systems to create opportunities for students to access and successfully complete advanced study programmes, the volume of graduates at bachelor's and master's level relative to total resident population in a given country is influenced by at least three main factors. In countries with ageing populations, such as Portugal or Germany, graduate numbers relative to total population will be lower than for countries with more youthful populations, even if these countries admit and graduate equivalent proportions of resident young people, as youth cohorts make up a smaller proportion of the total population. In some higher education systems, such as Canada, short-cycle programmes account for a significant proportion of total enrolment and graduation in higher education, while bachelor's and master's programmes play a smaller role in the higher education landscape than in many European countries, some of which, such as Finland, have no short-cycle tertiary provision. Finally, the proportion of international students in a higher education system will also influence – sometimes significantly – overall graduate numbers. In countries such as Australia and the United Kingdom, where international students accounted for, respectively, 28% and 19% of total enrolment in higher education in 2019, "imported" students boost total graduate numbers. Depending on immigration rules and job opportunities, international graduates can, nevertheless, contribute to domestic skills supply.

As shown in Figure 2.12, although the overall number of bachelor's and master's graduates per 10 000 population in Portugal is slightly below the OECD average, this is partly because of comparatively low numbers of new graduates in the arts, humanities and social sciences (31 graduates per 10 000 population in 2019 compared to an OECD average of 37). In contrast, the number of bachelor's and master's graduates in sciences and engineering (including construction) was above the average of OECD countries, at 19 per 10 000 population in 2019, compared to 15 on average in the OECD. For comparison, in Ireland, the United Kingdom and Germany – the three countries with highest annual numbers of graduates in sciences and engineering – the equivalent figure was 24 graduates in sciences and engineering per 10 000 inhabitants in 2019. This situation reflects Portugal's strong tradition of advanced education in engineering and certain scientific fields.

In contrast, the number of bachelor's and master's graduates from information and communication technologies (ICT) fields per 10 000 population, at 1.1, was below the OECD average of 2.9, and significantly below leading countries such as the United States (4.3), Denmark (5.9), Finland (7.6) and Ireland (12.6). In 2019, the share of bachelor's and master's graduates from ICT-related programmes was 1.5%, compared to an average proportion in OECD countries of 3.7%. The low share of graduates in ICT in Portugal appears to result not only from a lack of supply from higher education institutions, but also a lack of demand from students. In 2021, 23% of study places offered in ICT remained vacant after the three phases of the National Access Competition: a significantly larger proportion of vacant places than in the higher education system as a whole (8%) (DGES, 2021^[35]).

Figure 2.12. Graduates from bachelor's and master's degrees per 10 000 population in 2019



Note: Countries are presented in descending order of the number of bachelor's and master's graduates per 10 000 population in ICT, science and engineering (combined).

Source: OECD (2021^[14]) Education at a Glance 2021: OECD Indicators, <https://dx.doi.org/10.1787/b35a14e5-en>

StatLink  <https://stat.link/deukwh>

As shown in Table 2.6, the proportion of graduates in different fields of study varies between the regions of Portugal, reflecting differences in the Herfindahl index of concentration. For example, across regions, the share of graduates in ICT in 2019/20 was higher in Madeira (5.1%), the North Region (3.1%) and to a lesser extent the Azores (2.9%). In general terms, Alentejo and Madeira show a lower degree of concentration across fields than the national average, while the Azores shows a higher degree of concentration (indicated by a higher Herfindahl index).

Table 2.6. Graduates by subject area and specialisation index by region in 2019/20

General area	Portugal	North Region	Central Region	Lisbon M.A	Alentejo	The Algarve	The Azores	Madeira
Business sciences, administration and law	21.3%	20.2%	17.2%	25.8%	17.2%	18.2%	20.2%	15.1%
Engineering, manufacturing and construction	19.1%	20.7%	21.6%	18.2%	7.0%	11.2%	1.4%	14.1%
Health and social protection	16.8%	18.2%	19.9%	13.5%	17.1%	17.6%	24.9%	10.0%
Social sciences, journalism and information	11.4%	10.3%	9.3%	13.7%	8.6%	12.8%	20.2%	15.6%
Arts and humanities	9.5%	9.2%	11.2%	9.2%	8.5%	5.9%	5.0%	8.6%
Services	6.4%	6.5%	5.9%	5.5%	14.3%	10.1%	4.7%	12.0%
Natural sciences, mathematics and statistics	6.2%	4.8%	6.9%	6.5%	5.3%	17.6%	11.1%	6.1%
Education	4.1%	4.4%	4.0%	3.4%	6.5%	4.7%	6.2%	12.4%
Information and communication technologies (ICTs)	2.6%	3.1%	2.1%	2.5%	1.9%	0.6%	2.9%	5.1%
Agriculture, forestry, fisheries and veterinary science	2.6%	2.7%	1.9%	1.7%	13.6%	1.2%	3.3%	6.1%
Herfindahl index	0.143	0.146	0.148	0.154	0.125	0.140	0.167	0.121

Note: Data include all levels of higher education, including TeSp and doctoral education. The H index is calculated as $H = \sum_{i=1}^{10} sh_i^2$ where sh is the share of students in study field i. M.A. = metropolitan area; A.R. = Autonomous Region.

Source: DGEEC (2021^[11]) *Estatísticas – Ensino Superior (Statistics – Higher Education)*, <https://www.dgeec.mec.pt/np4/18/> (accessed on 15 November 2021).

The role of higher education in reskilling adults remains limited

Portugal, like many OECD countries, is pursuing strategies to encourage adults to enter or re-enter higher education to enhance their skills. Policy goals for 2020-23 include stimulating the offer of undergraduate programmes outside working hours (referred to in Portugal and the “after-work regime” – *regime pós-laboral*) to promote upskilling and reskilling and capturing new audiences through an expanded offer of online courses, including through the Open University (Universidade Aberta) and distance programmes accredited in other higher education institutions.

The “UPskill” programme is an example of a national initiative aiming at reskilling in digital technologies, specifically targeting unemployed or under-employed professionals. The programme provides six months of training in ICT-related areas in a higher education institution, followed by a three-month internship in one of the participating companies. Participants receive a grant equivalent to the national minimum wage and a food allowance (UPskill consortium, 2022^[36]). Other actions to raise the skills of adults in response to changing demands from the labour market include the “Impulso Adultos” programme (Impetus programme for adults), the InCode2030 Strategy (Government of Portugal, 2022^[37]) and its Capacitar i4.0 programme and the Indústria 4.0 programme, focused on firm competitiveness.

“Impulso Adultos” is financed by the European Union Recovery and Resilience Programme for 2021-26 (*Plano de Recuperação e Resiliência - PRR*), which has allocated EUR 130 million to support universities and polytechnics design and deliver short upskilling and reskilling programmes for adults in co-operation with employers (DGES, 2021^[38]).

The impact of these initiatives – and current needs for upskilling and reskilling in Portugal’s working-age population – are difficult to assess because of a lack of data. Based on findings from the European Labour Force Survey, the share of adults in Portugal participating in lifelong learning, defined as formal and non-formal education and training in the previous four weeks, was 12.9% in 2021. This was slightly higher than the average level in the EU of 10.8%. This marks a slight increase in comparison to previous years,

although participation rates have been around 10% since data collection began in 2012. In the European Union, the highest rates of adult learning using this indicator (all above 20%) were in Sweden, Finland, the Netherlands and Denmark (Eurostat, 2022^[7]). In Portugal, rates of participation were highest in the Lisbon Metropolitan Area (around 15%) and lowest in the autonomous island regions of Madeira and the Azores (around 10%).

In the higher education sector, the age profile of students provides an indication – albeit imprecise – of the level of participation of adults in advanced-level upskilling and reskilling during their careers. In 2020, 16.5% of all students enrolled in higher education in Portugal were aged between 30 and 64 – in other words in the age range by which most individuals have completed their initial education and which runs (nearly) until retirement. This is broadly in line with the average of EU countries (16.9%) and well above countries such as France and Belgium, which are characterised by particularly young student populations (the equivalent figures for France and Belgium were 7.3% and 8.2%). Nevertheless, here again, Finland and Sweden stand out, along with Estonia, as countries where more than 30% of students are aged between 30 and 64 (Eurostat, 2022^[7]).

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Notes

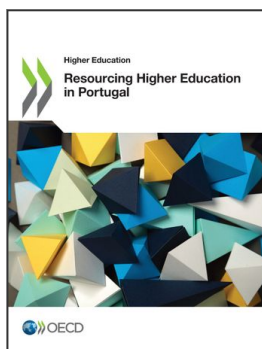
¹ The total number of organic units was 326 when those that had no enrolment in 2020/21, but had enrolment in previous years, are included.

² Integrated master's degrees are equivalent to between 300 to 360 ECTS credits and with a normal duration of between 10 and 12 semesters. The workload may be determined by requirements for access to certain regulated professions, in line with Portuguese and more general European requirements.

³ Sometimes referred to as “double-certification programmes” (*cursos de dupla certificação*), as they are theoretically designed to prepare students to enter the labour market or access higher education.

⁴ The General Access Regime for public higher education institutions comprises a) the National Access Competition (CNA) and b) “local competitions” in a limited number of subject areas, such as the visual and performing arts. It excludes students entering through “special” competitions for specific population groups and does not cover entry to short-cycle TeSP programmes.

⁵ Including information and communication (2.1%), financial and insurance activities (1.7%), and professional, scientific, technical and support activities (11.8%)



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