Developing an understanding of projected rates of progression from entry to professional employment

Methodology and results

Experimental statistics

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Introduction

1. This research report outlines a new measure reporting projected rates of students progressing from entry to first degree programmes through to professional employment or further study (previously referred to as 'start to success'). It brings together projected data on the number of full-time first-degree students who complete their studies (completion rates) with data about the progression of recent graduates to employment, further study or other activities (graduate outcomes). It also describes some of the known limitations of this method.

2. The projected 'entry to professional employment' outputs produced from the application of this methodology include data by provider, by subject across the sector and subject within each provider. These outputs are published in anonymised form as experimental 'ad hoc' statistics[1] (see the accompanying workbook).

3. The OfS is publishing this report because we consider that there is a strong public interest in publishing information about outcomes for students who start higher education courses. We have also taken account of our general duties in section 2 of the Higher Education and Research Act 2017. These require that we have regard to the need to promote quality, choice and opportunities for students, as well as encourage competition between English higher education providers in connection with the provision of higher education. We judge that publishing new, innovative measures, intended over the longer-term to improve the information available about student outcomes, is consistent with these duties.

4. In publishing this report, we take the view that prospective students should have access to information about the quality of provision at individual providers. Measures similar to the outcomes introduced by this report have the potential to provide useful information for prospective students to inform their choice of higher education provider and course. We want all potential higher education students to receive improved and effective information, advice and guidance, enabling them to make the choices that are right for them. Better informed choices have the potential to help more students complete their studies and achieve positive outcomes. So, we consider that this new indicator could represent a positive step towards valuable new information for prospective students.

5. Current student-outcomes measures consider each stage of the student lifecycle separately. This means they can fail to highlight the chances of students who start studying in higher education going on to graduate and then have a positive outcome post-graduation. In particular, the cumulative effects of relatively low completion rates and professional employment rates can lead to an overall low chance of positive outcomes, which is masked by the separate consideration of the two outcomes. We acknowledge that any method that tries to understand student outcomes across the whole lifecycle will have limitations, and the measure introduced in this report is no exception. Users should therefore remain alert to the limitations this report describes. Notwithstanding these limitations, we consider that the new measure has

[1] Experimental statistics: A subset of newly developed or innovative official statistics undergoing evaluation. Experimental statistics are published to involve users and stakeholders in the assessment of their suitability and quality at an early stage. The ad hoc statistics status indicates that we do not currently have an expectation of routine and regular publication of these statistics. If we consider that there is a high likelihood that these measures would be published more routinely, we would expect to release future analyses as experimental official statistics.

significant advantages, allowing us to use the most recent data available to produce information in which we consider there is a public interest.

6. As an official statistics producer we are committed to releasing our data in a manner that promotes public confidence, and to complying with the Code of Practice for Statistics.[2] Introducing a potential new measure of projected entry to professional employment outcomes through this publication of experimental statistics allows us to involve users and stakeholders at an early stage in assessment of their suitability for the intended purposes. We intend that publication of this report will initiate a broader discussion with providers, students and other stakeholders about the accuracy, purpose and use of the measure, and will allow us to find out how best to present it in a meaningful way. We therefore welcome feedback on these experimental statistics. To give feedback email providermetrics@officeforstudents.org.uk.

7. We are already aware of a number of potential further developments to this methodology. We are also alert to the likelihood that wider changes in the higher education data landscape will cause us to keep this methodology under review as understanding of, and approaches taken to using that data, develop. For example, we welcome feedback about:

    a. the feasibility of extending the coverage of this methodology to other cohorts (for example, to part-time students)

    b. how results should be reported to most effectively communicate the confidence that users can have in the outputs for the intended longer-term purposes

    c. whether there exist novel statistical approaches which would effectively communicate the levels of statistical uncertainty in the compound measure.

8. Subject to feedback through both the current consultation and following this publication of experimental statistics, as well as user testing, the OfS anticipates publishing further provider-level data on the measure during 2021.

Key findings

9. Some key findings from the analysis are:

    - Projected rates of progression from entry to professional employment vary substantially by subject group across the sector, and by provider at both provider-level and subject-level.
    - There is a clear correlation between the two components of the measure at provider level – where a provider has a relatively high proportion of students projected to obtain a degree, it is more likely to have a high proportion of graduates in professional employment or further study.
    - For subject groups across the sector, there is little correlation between the two components of the measure – a subject group having a relatively high proportion of students projected to obtain a degree does not appear to make it much more likely to have a relatively high proportion of graduates in professional employment or further study.

[2] See www.officeforstudents.org.uk/data-and-analysis/official-statistics/

- Provider-level projected rates of progression from entry to professional employment appear to be strongly linked to entry tariff – students at high-tariff providers are more likely to progress from entry to first degree programmes through to professional employment or further study.
- The projected rates of progression from entry to professional employment vary substantially by subject group within many providers.

Method

10. Embarking on a higher education course has the potential to be a life-transforming event – an enriching academic experience that paves the way for rewarding options in the labour market and a fulfilling life. Students pay a significant price for these opportunities, through their time and effort, as well as in financial terms. The OfS's regulatory objectives reflect the things that matter most to students: high quality courses, successful outcomes, and the ongoing value of their qualifications. We believe that when making choices about higher education, all potential students should have access to personalised, high-quality and accurate advice about all of these aspects to inform what, where and how they study. Providing prospective students with an understanding of student outcomes across the whole student lifecycle, which is both reliable and timely, represents a particular challenge.

11. To determine a true rate of progression from entry to professional employment it would be necessary to track a starting cohort through their study and into their final destinations, but such a method has serious drawbacks. Most notably, it would not reflect the recent performance of subjects or providers and risks generating misleading results in the event of changes in the provision offered by a provider over time. In practice, we consider that we would need to consider the outcomes of students who started full-time courses in 2011-12 as the most recent available to give a comprehensive, whole-lifecycle view and allow enough time for the cohort to complete their studies. The outcomes of students who started their courses around a decade earlier than the cohort of prospective students making their choices today could be very different as a result of the provision on offer to them, their experiences in higher education and the labour market prospects they face on graduation. Student tracking is also problematic where data collection methods change, (for example, the move from the Destinations of Leavers from Higher Education (DLHE) survey to Graduate Outcomes (GO), as the data will not be comparable for different leaving cohorts).

12. Considering each stage of the student lifecycle separately, rather than looking at their cumulative effects, can fail to provide sufficient clarity for prospective students about how likely they are to graduate and achieve a positive outcome. Employment rates are only calculated with reference to students who qualify with a higher education award, and users of these statistics may not always realise that – whatever this rate is – they will have a lower overall chance of positive outcomes on account of the likelihood that not all the students who start studying will complete their course.

13. In this research report, we have therefore considered a method that aims to project the proportion of students who will achieve a degree, using the most recent patterns of student retention, and then looks at the most recent patterns of graduate employment, to generate a measure of how likely entrants are to have successful outcomes. To do this, we have drawn on well-established methods from the Higher Education Statistics Agency (HESA) UK performance indicators (UKPIs).

14. We anticipate that compounding measures that will individually be familiar to stakeholders, will help to develop an important discussion about how these measures can interact to convey useful information about outcomes for students who start higher education courses. We are, however, aware of some important constraints of the measures individually, and these may be magnified to some extent through combining them to create the projected rates of progression from entry to professional employment.

15. The projected completion measure:

- needs a significant number of students to be stable, around 250 students informing the transition matrix that underpins the method
- needs structured programmes with a defined year structure, which is problematic for flexible and part-time provision
- relies on stable patterns of provision over time as changing programme structures can lead to unreliable results
- will give different aggregate results for subjects and providers.

16. The professional employment[3] or further study measure:

- relies on survey data so may be subject to response bias, although work by HESA[4] indicates these effects are likely to be small
- only includes students who gain a first degree, so students who have a positive outcome but did not qualify may not count positively
- requires subjective decisions about which circumstances and activities to consider as a positive outcome
- only considers the most important activity of the graduate at a single point in time, which may not be representative of all activities of the graduate or the outcomes of the graduate over different time frames
- is likely to be influenced by geographical effects on the labour market and the economic environment.

17. To derive the projected entry to professional employment measure presented here, the proportion of students projected to obtain a first degree at their original provider (also referred to as the 'projected completion rate') is multiplied by the proportion of Graduate Outcomes respondents in professional employment or any type of further study 15 months after completing their course (also referred to as the 'professional employment or further study rate'). In combining the indicators, we have made a series of minor refinements and adaptations to the established HESA definitions, which are designed to minimise the constraints described above. We therefore consider that the compound measure is more robust than users simply combining the two existing measures, and has significant advantages in allowing us to use the most recent data available to produce information that provides a good approximation of a prospective student's chance of both graduating and having a positive outcome after graduation. Combining the two measures in this way does, however, introduce additional drawbacks:

    - Although individual students will define their success beyond graduation in relation to their own goals and motivations, creating the projected entry to professional employment measure requires selecting a single outcome from each of the component indicators as the multipliers. We consider that it is important to ensure that the outcomes graduates are achieving are consistent with the higher education qualification they have started and aim to complete. In selecting the single outcomes to multiply, we believe that it is appropriate to look at rates of completion of the qualification intended,

[3] 'Professional employment' may be referred to as 'highly skilled employment' in other contexts.

[4] See www.hesa.ac.uk/news/21-05-2020/research-should-we-weight

and rates of progression into employment and further study destinations commensurate with the qualification they have completed.

- Some students may progress into professional employment or further study without qualifying with a first degree at their original provider (for example, after transferring to a different provider or qualifying with a lower-level award), but these paths are not counted positively by the compound measure. Although students who transfer to full-time first degree study and go on to complete will be treated positively in respect of the new provider.
- The projected completion rates are reported for a recent cohort of students starting their first degree, and the employment rates are reported for a cohort of students who achieved their qualification in that same year. The cohorts of students considered by the two measures are therefore non-overlapping and could differ in a way that could create misleading results if cohorts have changed over time. For example, if the provider has become more selective this may improve both retention and employment rates, but employment rates would still reflect the composition of earlier cohorts.

18. Additionally, in producing outputs at subject-level we have categorised subjects according to level 2 of the Common Aggregation Hierarchy (CAH)[5], and we note:

    - In many cases subject groups within providers will not have large enough cohorts to have reliable projected entry to professional employment data. In selecting CAH level 2 as the aggregation we have sought to achieve a reasonable balance of the risks of data sparsity and statistical uncertainty against the granularity necessary for that resource to convey the understanding appropriate to its intended purpose. This means that:
        - Subjects may be listed without any publishable outcomes. An absence of data in such cases should not be taken to signal negative performance for that provider.
        - A provider having subjects flagged as potentially unreliable should not be taken to mean that their provider-level data is unreliable, as provider-level projections are not simple aggregations of the subject-level projections.
        - Outcomes reported at this level of aggregation may mask variations in outcomes for courses or for more granular subject areas within a CAH level 2 grouping. It is likely that the number of unreliable or unpublishable subjects would increase significantly if the statistics were to be constructed at lower levels of granularity.
    - Subject-level outputs may be misleading if students change subjects between starting a higher education course and qualifying. It may be possible to address this in future by looking at professional employment or further study data by starting rather than qualifying subject.
    - The current transition between subject coding frameworks will present a longer-term challenge to the consistency of reporting student outcomes at subject-level over a time series, and the 2017-18 cohorts covered by the statistics in this report are among the first to be examined through the lens of the CAH classification.

19. To attempt to mitigate some of these issues we have taken a number of steps and we have considered some alternative approaches. In preparing to release these statistics, the OfS undertook a representations process with the providers included in the publication regarding

[5] Information about these subject groupings is available from: www.hesa.ac.uk/innovation/hecos

the accuracy of their data and its presentation, and consideration of responses has resulted in further amendments to the statistics and the way they are presented.

20. In particular, we note that the workbook that accompanies this research report and provides the detailed statistics, includes the two components of completion and graduate outcomes data with a granular breakdown of each. This means that users can explore the impact of counting a different set of outcomes in the projection calculation if they wish to do so. For example, users can see if respondents to the Graduate Outcomes survey had outcomes that could be considered as positive but are not counted positively by the professional employment or further study measure, and can investigate the effect of removing students with ‘other known destinations’ from the measure.

Results

Results by subject group

21. For the sector[6] in aggregate, 34 of the 35 CAH2 subject groups have sufficient numbers of starters and GO respondents for their projected entry to professional employment outcomes to be reportable. None of these 34 subject groups are categorised as potentially unreliable. The numbers of starters and GO respondents in Celtic studies are too small for data for that subject group to be considered, for projected completion and graduate outcomes respectively.

Projected completion by subject group

22. There are just over 25 percentage points between the subject group with the highest proportion projected to obtain a degree (medicine and dentistry, 92.4 per cent) and the subject group with the lowest (computing, 67.0 per cent). Other subject groups with high proportions include veterinary sciences (89.6 per cent) and geography, earth and environmental studies (88.0 per cent), while others that have lower proportions include sport and exercise sciences (68.2 per cent) and general, applied and forensic sciences (71.0 per cent).

23. Of the 34 subject groups, 19 of them have proportions projected to obtain a degree above 80 per cent. A further 13 have proportions between 70 and 80 per cent. Only computing and sport and exercise sciences have percentages below 70 per cent. These subject groups also have the highest proportion projected to obtain another award (7.0 and 6.7 per cent respectively) and the highest proportion projected to neither obtain an award nor transfer (18.7 and 19.4 per cent respectively).

24. Of the proportions projected to transfer, the three highest are for pharmacology, toxicology and pharmacy (9.8 per cent), engineering (8.8 per cent) and medical sciences (7.8 per cent).

Graduate outcomes by subject group

25. The proportions in professional employment or any type of further study vary significantly by subject group. The highest proportion is for those who studied medicine and dentistry (97.1 per cent) followed closely by nursing and midwifery (92.4 per cent) and veterinary sciences (89.8 per cent). The proportion that were unemployed is below 1 per cent for both medicine and dentistry and nursing and midwifery and 1.4 per cent for veterinary sciences.

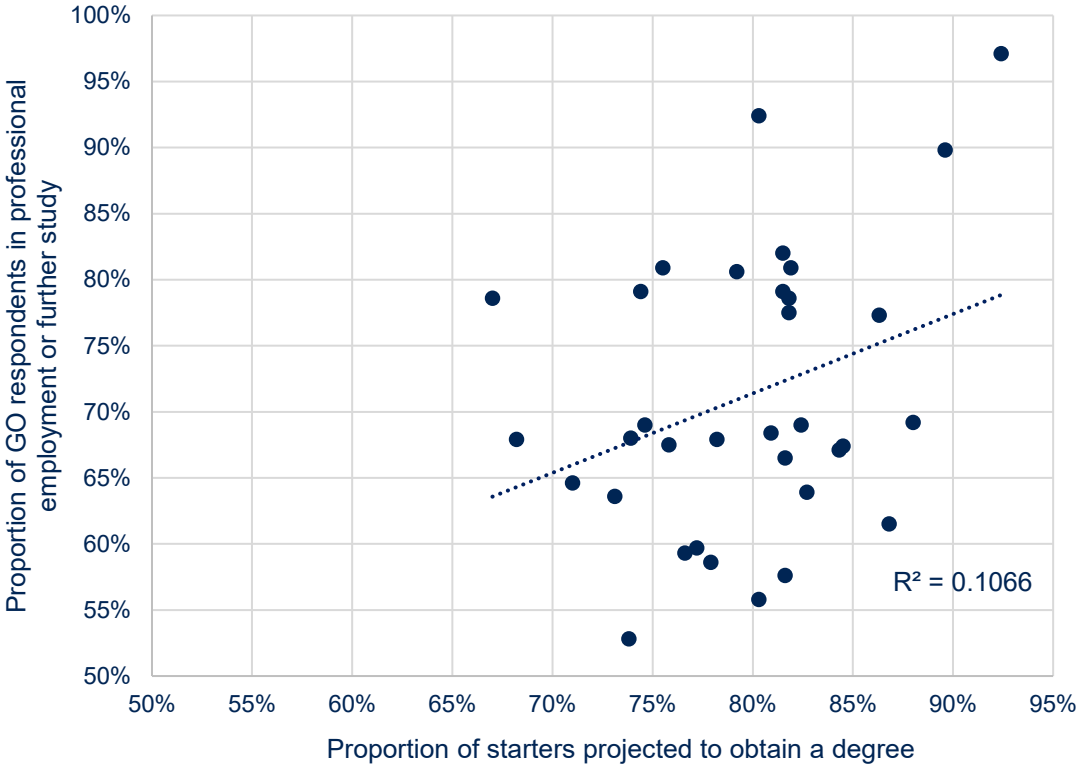
26. There are six subject groups where the proportion in professional employment or study of any type is below 60 per cent. The lowest is for sociology, social policy and anthropology (52.8 per cent) and the next lowest is psychology (55.8 per cent). Among sociology, social policy and anthropology graduates, 33.7 per cent were in other employment (not professional), 6.8 per cent were unemployed and a further 6.8 per cent were in other destinations. For psychology graduates, the equivalent figures are 31.8 per cent, 6.6 per cent and 5.8 per cent, respectively.

[6] The sector in this report is English providers that made a Student or Student Alternative record return to HESA in 2017-18 and were registered with the OfS on 23 October 2020. Students registered at further education colleges are not included.

Projected rates of progression from entry to professional employment by subject group

27. There are 34 subject groups where the projected rate of progression from entry to professional employment can be derived. Figure 1 shows the relationship between the proportions of starters projected to obtain a degree and the proportions of graduates in professional employment or further study for these subject groups. It shows that there is little correlation between the two components of the projected entry to professional employment measure when applied to subject groups.

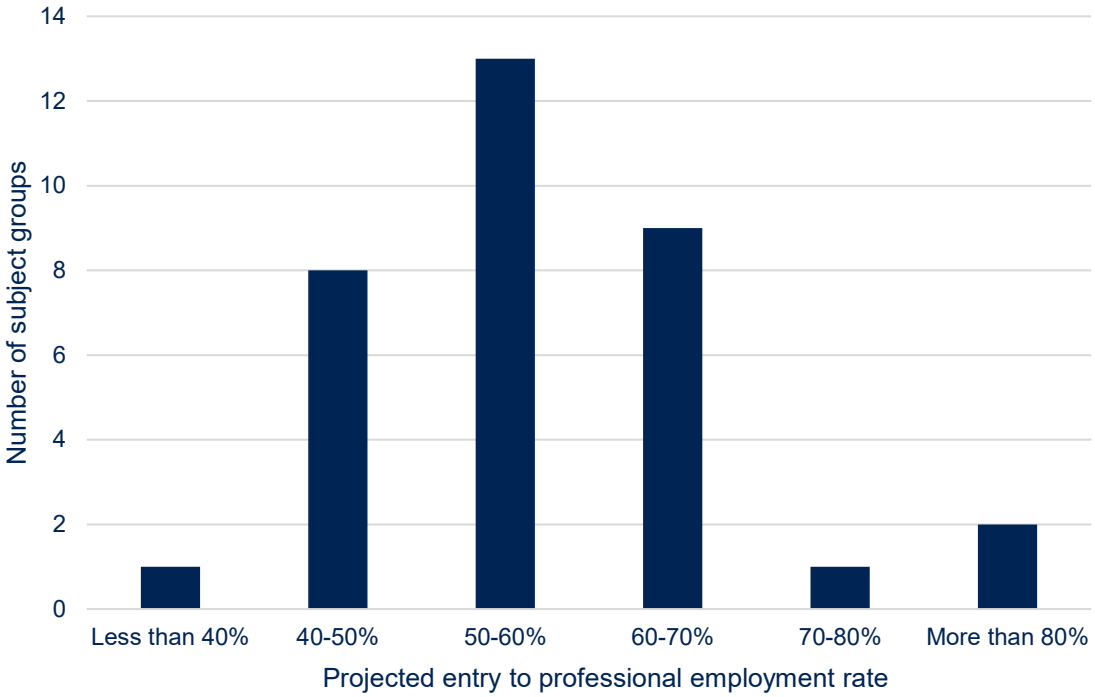
Figure 1: Relationship between the two components of the projected entry to professional employment measure by subject group



28. Figure 2 shows how the subject groups' projected rates of progression from entry to professional employment are distributed across percentage bands. A relative majority of subject groups (13) have rates in the 50 to 60 per cent range.

29. There is a difference of almost 51 percentage points between the subject group with the highest projected rates of progression from entry to professional employment (medicine and dentistry, 89.7 per cent) and the lowest (sociology, social policy and anthropology, 39.0 per cent). In fact, medicine and dentistry has the highest projected rate by a substantial margin and there are only two other subject groups with a projected rate above 70 per cent (veterinary sciences, 80.5 per cent, and nursing and midwifery, 74.2 per cent).

Figure 2: Projected rates of progression from entry to professional employment by subject group



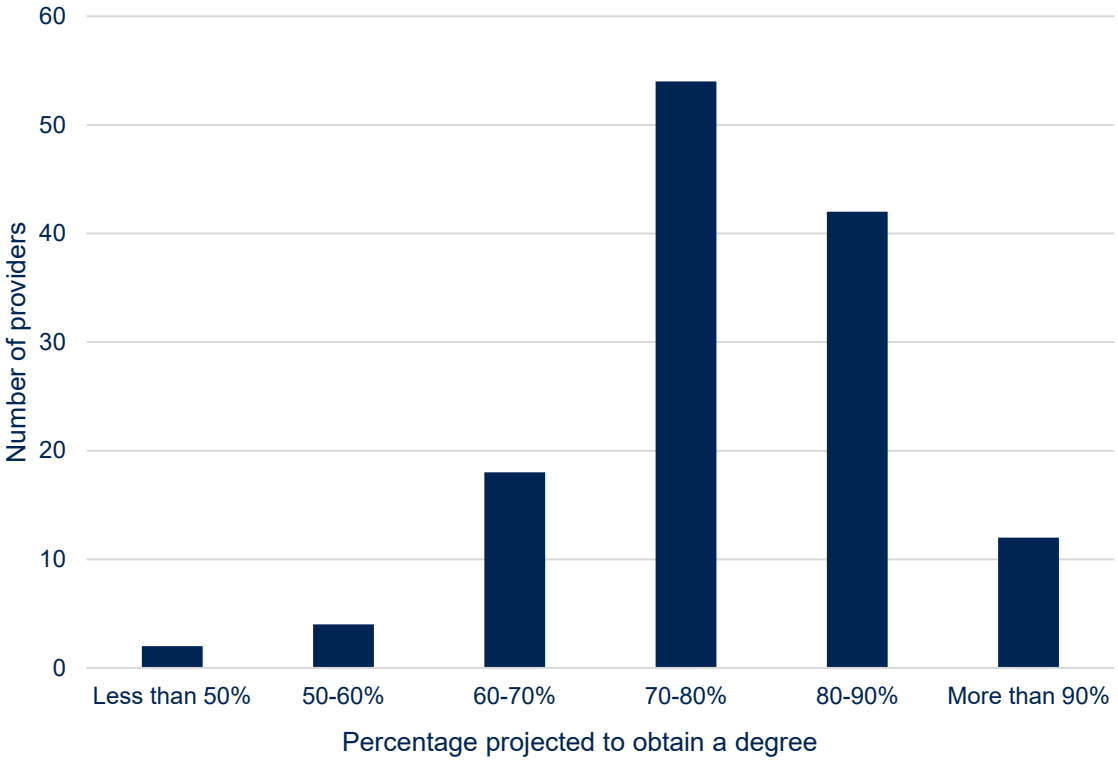
Results by provider

Projected completion by provider

30. There are 132 providers with completion projections that meet the reliability criteria for this measure described in paragraph 64. Figure 3 shows the distribution of these providers' projected completion rates, across bandings. The most populated banding is 70 to 80 per cent, with 54 providers, but there are also 42 providers in the 80 to 90 per cent banding and 18 with projected completion rates between 60 and 70 per cent. There are 12 providers with projected completion rates of more than 90 per cent and six providers with projected completion rates of less than 60 per cent.

31. These are projections for completion of a first-degree level qualification within the original provider. They do not include students projected to qualify with another undergraduate-level award or transfer to another provider. Some providers have significant proportions of students projected to have one of these two outcomes. The individual provider-level projections are available in anonymised form in the accompanying workbook.

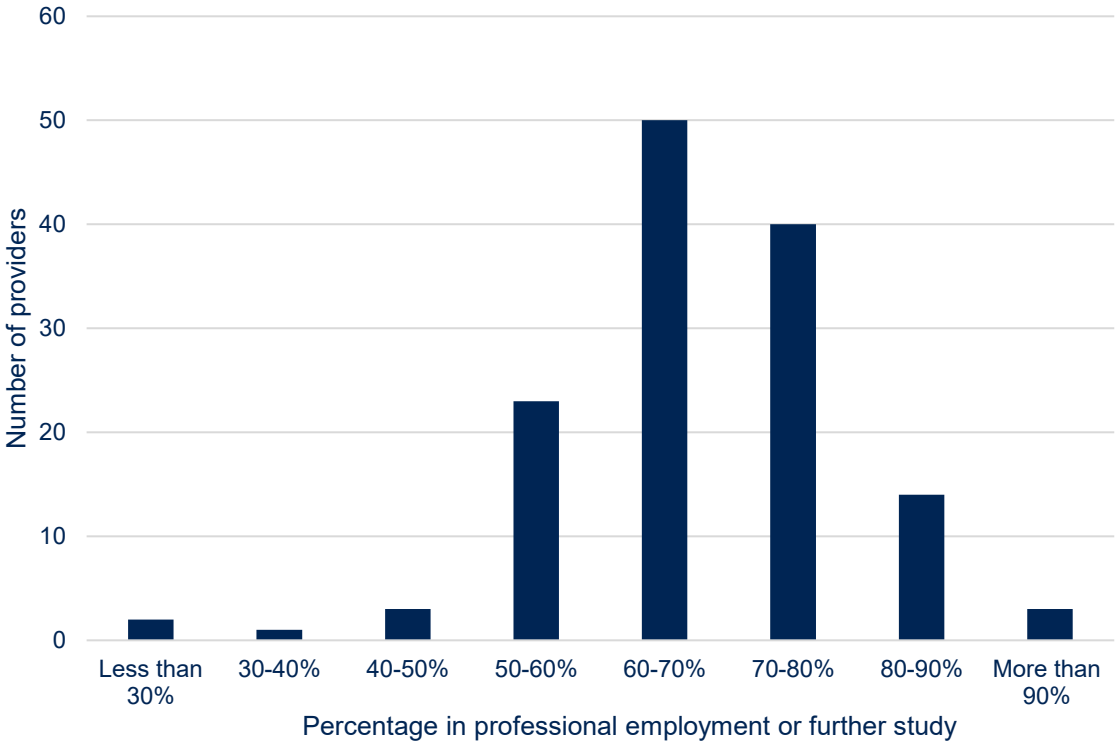
Figure 3: Proportion projected to obtain a degree by provider



Graduate outcomes by provider

32. There are 136 providers with graduate outcomes data that meet the reliability criteria for this measure described in paragraph 66. Figure 4 shows how these providers' percentages in professional employment or further study are distributed across bandings. The most populated banding is 60 to 70 per cent in professional employment or further study, with 50 providers in this group.

Figure 4: Proportion in professional employment or further study by provider



The effect of graduate location

33. The destinations of graduates observed in Graduate Outcomes data are likely to be influenced by the geographical locations of those graduates. This may contribute to lower projected rates of progression from entry to professional employment for providers in certain areas of the country, particularly those with large proportions of local students. Annex A shows the proportions of 2017-18 Graduate Outcomes respondents in professional employment or further study by graduate location,[7] at county or unitary authority level. It shows that the proportions of respondents in professional employment or further study range from 65 per cent (among respondents in North Somerset and respondents in Cornwall) to 82 per cent (among respondents in West Berkshire). This gives an indication of the variation across the country, although there will be further variation within these areas.

Projected rates of progression from entry to professional employment by provider

34. There are 125 providers where the projected entry to professional employment measure can be derived reliably.[8]

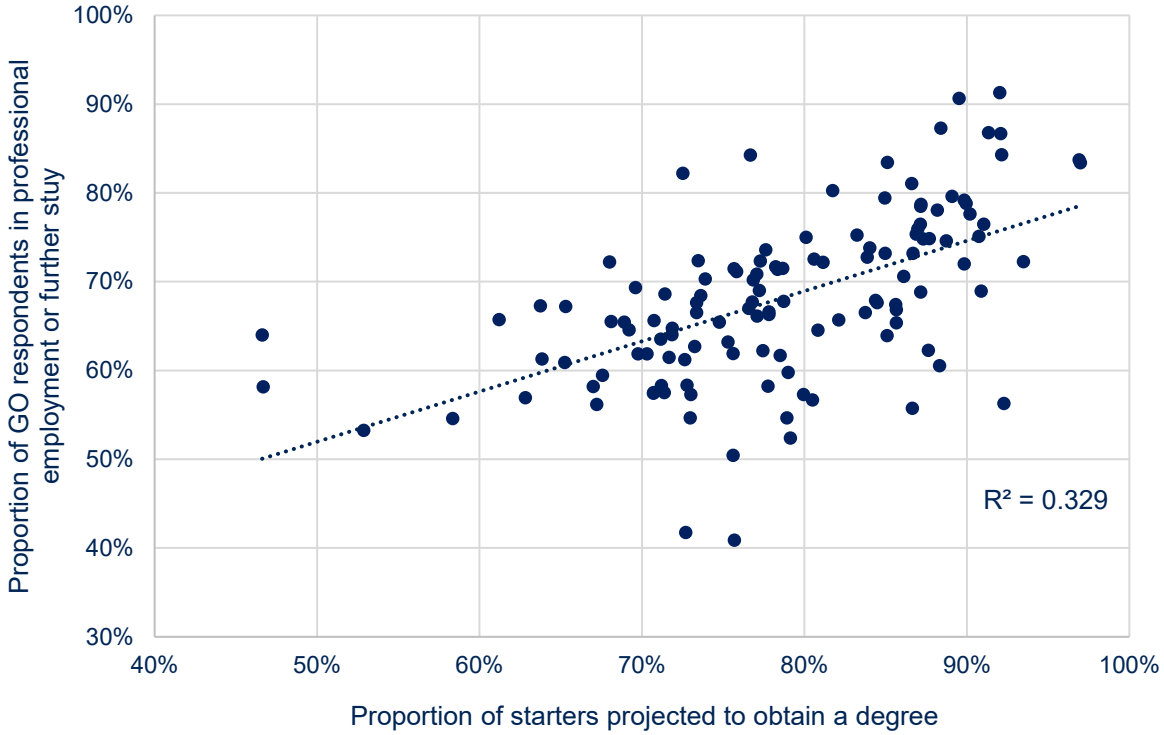
35. Figure 5 shows the relationship between the proportions of starters projected to obtain a degree and the proportions of graduates in professional employment or further study, for

[7] This is the location of the graduate's main activity, according to their Graduate Outcomes response. See the HESA derived field XMLOCUC for further detail: https://www.hesa.ac.uk/collection/c17072/derived/xmlocuc

[8] This is where neither of the two component parts of the measure is identified as potentially unreliable.

providers. This figure shows a clear positive correlation between the two components of the projected entry to professional employment measure at provider-level. However, there are some providers with relatively high proportions projected to obtain a degree but relatively low proportions of graduates in professional employment or further study and vice versa.

Figure 5: Relationship between the two components of the projected entry to professional employment measure by provider



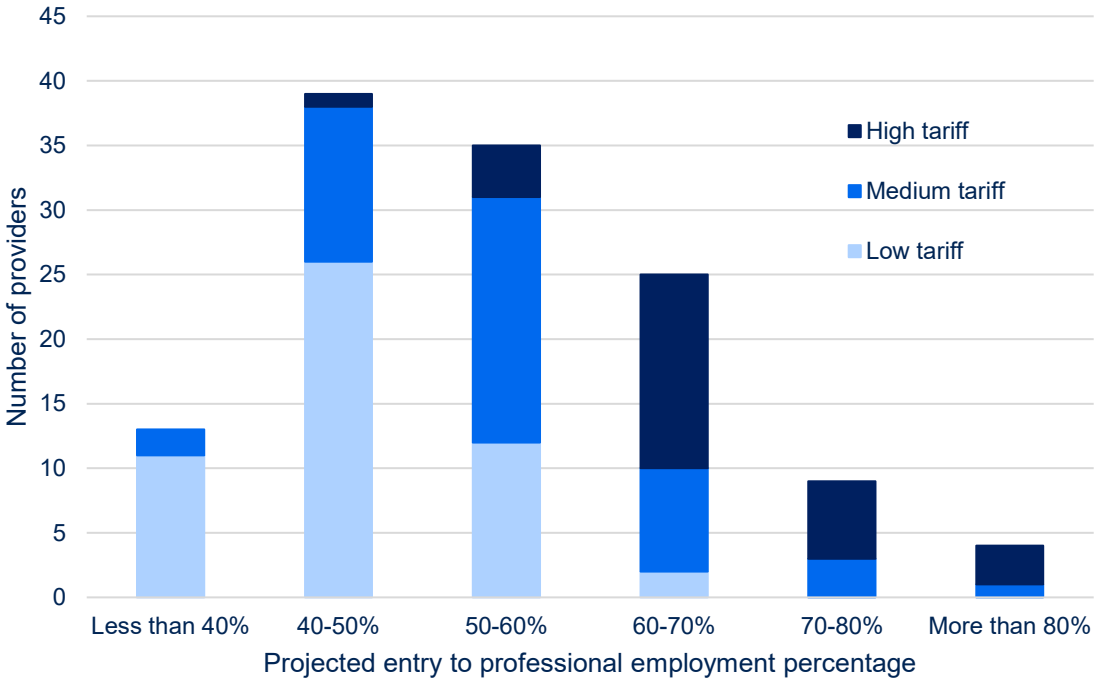
36. Figure 6 shows how the providers' projected rates of progression from entry to professional employment are distributed across percentage bands. The providers are split into tariff groups based on the number of UCAS points achieved by their entrants.[9] A relative majority of providers (39) have percentages in the 40 to 50 per cent range, followed closely by 35 providers in the 50 to 60 per cent range.

37. There is a clear relationship between the tariff group of a provider and their projected rates of progression from entry to professional employment: high-tariff providers generally have higher rates and low-tariff providers generally have lower rates. Existing evidence shows that continuation after the year of entry and progression of graduates into professional employment or further study are both highly correlated with the strength of prior qualifications.[10] Three of the four providers that have rates above 80 per cent are considered high-tariff and the other is considered medium-tariff.

[9] These tariff groups have been taken from the 2019 Widening participation in higher education official statistics release: www.gov.uk/government/statistics/widening-participation-in-higher-education-2019. The 2017-18 groupings have been used.

[10] See www.officeforstudents.org.uk/data-and-analysis/access-and-participation-data-dashboard/sector-level-data/

Figure 6: Projected rates of progression from entry to professional employment by provider, split by tariff group



Results by subject group within provider

38. The following section contains boxplot charts to demonstrate the variability of subject-level performance across providers. These charts show the following key information:

    - The median rate among providers can be seen from the middle line in each box. The median shows the midpoint (50 per cent) of provider rates when ordered from lowest to highest.
    - The lower quartile rate among providers can be seen from the left line at the end of each box. A quarter of providers have a rate lower than this figure.
    - The upper quartile success rate among providers can be seen from right line at the end of each box. A quarter of providers have a rate higher than this figure.
    - The minimum and maximum rates for each subject group are at the ends of the whiskers protruding from each box.
    - The number of providers contributing to the chart for each subject group can be seen in brackets after each subject name.

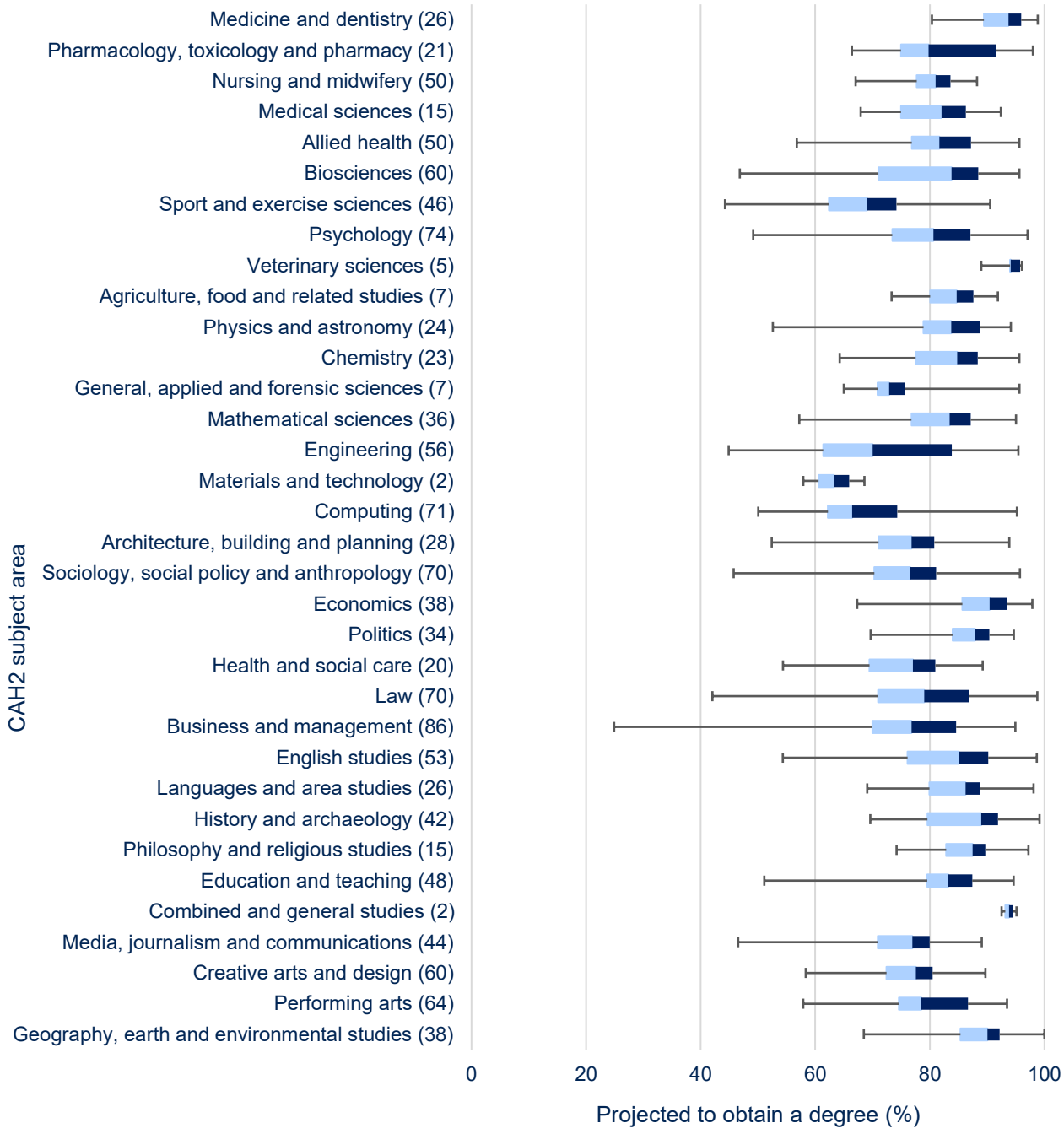
39. When considering these distributions of subject-level data, it is important to note that only subject data that meet the reliability criteria described in paragraphs 49, 64 and 66 has been included. This means that subjects at providers with smaller cohorts will often not be contributing to the boxplot charts that follow.

Completion by subject within provider

40. Across all providers, there are 1,311 subjects with projected completion rates not flagged as potentially unreliable. Figure 7 shows the distributions of these projected completion rates across the sector within each of the subject groups. It shows significant variation in projected

completion rates for some subject groups, with other subject groups having much more consistent projected completion rates across providers.

Figure 7: Distributions of projected completion rates, by subject group

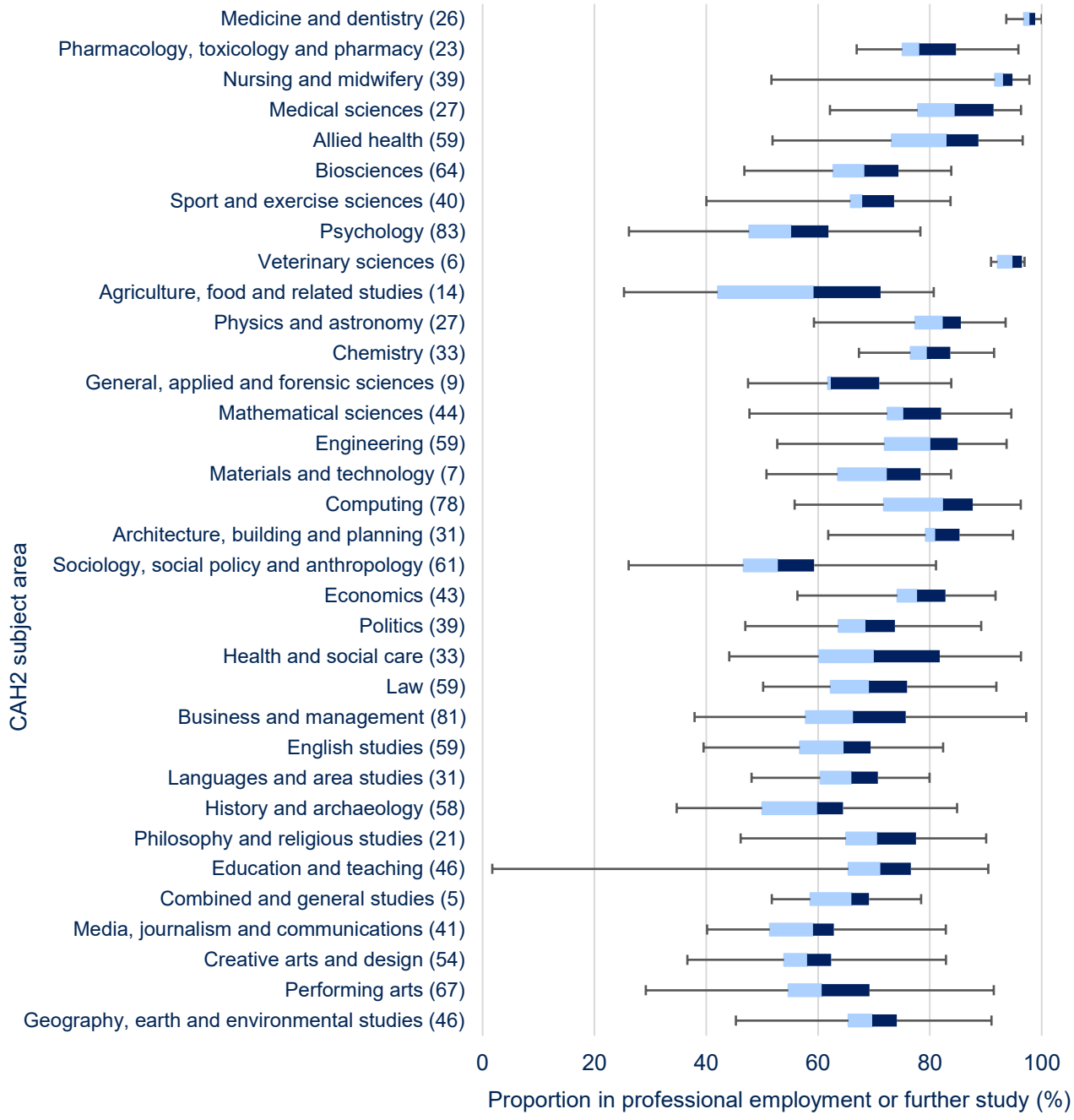


Graduate outcomes by subject within provider

41. Across all providers, there are 1,413 subjects with graduate outcomes data that meet the reliability criteria described in paragraph 66 . For these subjects, Figure 8 shows the distributions of the proportions of respondents in professional employment or further study within each subject group. Medicine and dentistry, veterinary sciences and nursing and midwifery have the highest median proportions of respondents in professional employment or further study (97.8 per cent, 94.8 per cent and 93.1 per cent, respectively).

42. The boxes are particularly narrow for medicine and dentistry and nursing and midwifery, demonstrating that the professional employment or further study rates are quite consistent for these subject groups across most providers. Some subject groups, such as agriculture, food and related studies, health and social care, and engineering, have much greater variation in their professional employment or further study rates across providers.

Figure 8: Distributions of professional employment or further study rates, by subject group

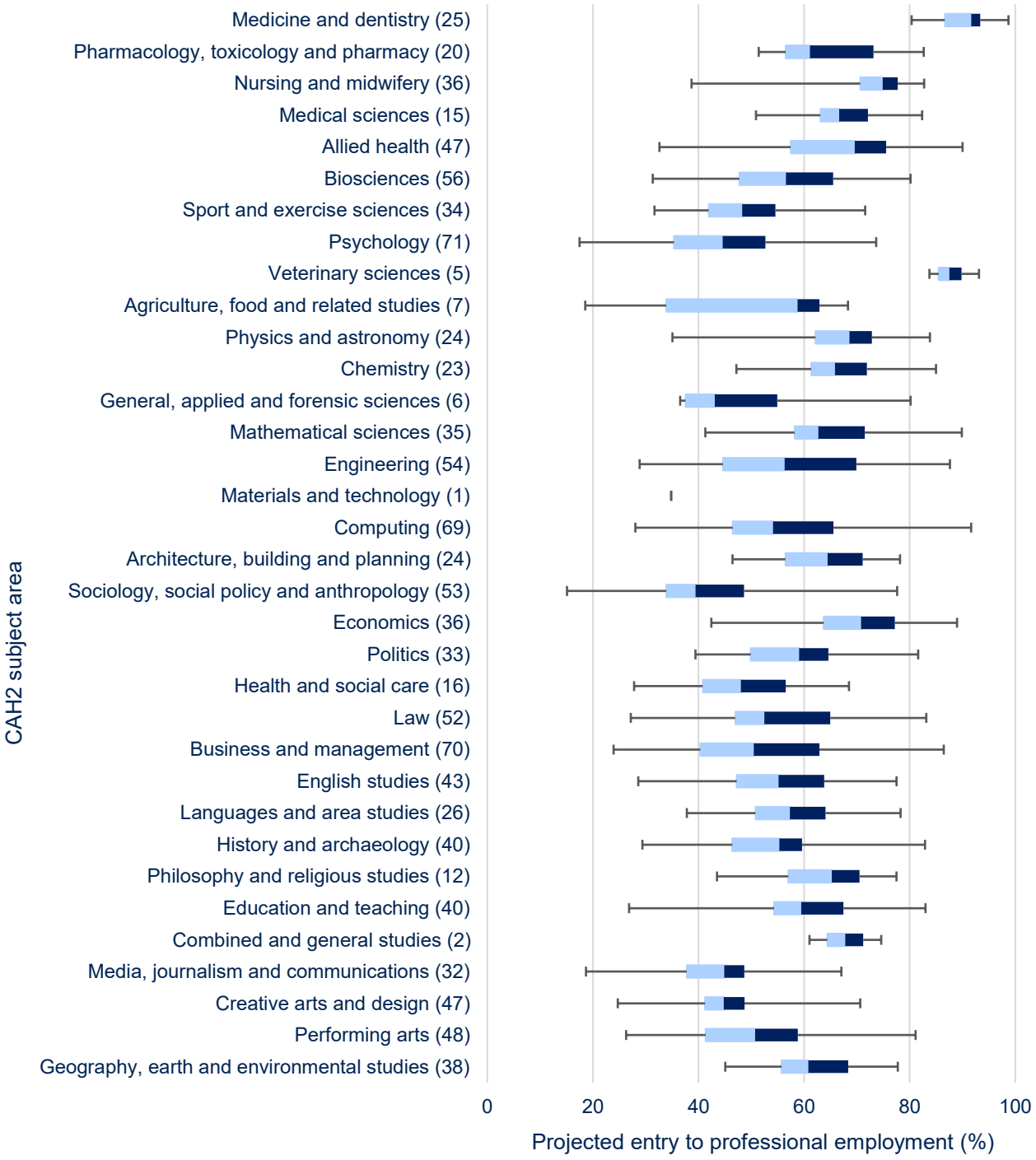


Projected rates of progression from entry to professional employment by subject within provider

43. There are 1,140 subjects with projected rates of progression from entry to professional employment that meet the reliability criteria described in paragraphs 49, 64 and 66. Figure 9

shows the distributions of these rates by subject group, across providers. Medicine and dentistry appears to have consistently high projected rates of progression from entry to professional employment. This is also true for veterinary sciences, although there are only 5 providers contributing to the chart for that subject group. Most of the other subject groups have significant variation in their projected rates of progression from entry to professional employment across providers.

Figure 9: Distributions of projected rates of progression from entry to professional employment by subject group



Technical notes

44. The analysis that underpins the projected rates of progression from entry to professional employment data relies on a number of definitional assumptions, and has a series of known limitations. These are explained in the technical notes that follow.

General notes about the data

45. The analysis is limited to providers returning HESA Student and Student Alternative data. Individualised Learner Record (ILR) data from further education colleges has not been used, nor have Graduate Outcomes responses from graduates of these providers. Only full-time, UK-domiciled[11] students on first-degree[12] level courses at English providers registered with the OfS on 23 October 2020 are considered.[13]

46. The completion projections are based on transitions from 2017-18 to 2018-19 and project the outcomes of starters in 2017-18, whereas the graduate outcomes data is based on responses to the Graduate Outcomes survey of 2017-18 graduates. Both are based on the most recent data available.

47. The subject groups used for the subject-level rates are the Common Aggregation Hierarchy level 2 groupings (CAH2). Where students were studying across multiple CAH2 groups, their data is attributed partially to each of the subject groups by a full person equivalent (FPE) count.

48. To derive the projected rates of progression from entry to professional employment, the proportion of starters projected to obtain a first degree at their original provider is multiplied by the proportion of Graduate Outcomes respondents in professional employment or further study of any type.

49. Projected rates of progression from entry to professional employment are categorised as potentially unreliable if either the projected completion rates or the professional employment or further study rate is categorised as potentially unreliable.

50. In general, numbers have been rounded to the nearest 5 and proportions to the nearest 0.1 per cent[14].

[11] Students from Guernsey, Jersey and the Isle of Man are not counted as UK-domiciled.

[12] First-degree level includes integrated masters' courses and other courses with undergraduate and postgraduate components.

[13] Student activity in other levels and modes of study is considered in order to identify transition patterns in the completion methodology, but only among students who were previously studying a full-time first degree. Similarly, as described in paragraph 58, student-level data from providers in Wales, Scotland and Northern Ireland has been used to the same end.

[14] See the section below on anonymising the provider-level data for a description of where this is not the case.

Presentation of provider data

51. For this experimental statistics release, we have determined that it is appropriate to anonymise the individual providers included in the statistics. Therefore, each provider is represented in the workbook that accompanies this report with a randomly assigned number (Provider 1, Provider 2 etc.).

52. In addition:

    - Student numbers (numbers of starters, qualifiers, GO respondents and those contributing to the transition matrix underpinning the projected completion methodology) within the provider-level and subject within provider data have been reported in bandings (fewer than 25, 25 to 100, 100 to 250, 250 to 500, 500 to 1,000, or more than 1,000).

    - Proportions have been rounded to the nearest 1 per cent.

    - Subject within provider data for providers with fewer than two subject groups not suppressed due to small numbers has been omitted[15].

Projected completion data: technical notes and known limitations

53. The methodology[16] from Table T5 of HESA's UKPIs has been used to estimate completion rates at provider-level and subject-level across the sector.

54. Starters and individual student transitions have been identified consistently for both the provider and subject-level outputs. In both outputs, completion of a full-time first degree is projected at the original provider. Transfers to other providers are included as a separate outcome and no distinction is drawn between students transferring to a new provider and then qualifying with a first degree and students transferring to a new provider and then becoming absent with no qualification.

55. There is also no consideration given to whether students will end up completing in their original subject area in the subject-level projections.

56. Completion projections are suppressed where there are fewer than 25 starters, in line with HESA reporting standards for the UKPI statistics derived using the Table T5 methodology.

Populations

57. The starter populations are identified from students registered at an English higher education provider in 2017-18. Only students at providers registered with the OfS on 23 October 2020 have been considered.

58. To identify the transitions of students, HESA Student and HESA Student Alternative data from 2016-17 through to 2018-19 has been used. UK-domiciled students registered at English

[15] Where not categorised as potentially unreliable, this data has been used to inform the charts and figures provided in this research report.

[16] Technical detail about this methodology is available at www.hesa.ac.uk/data-and-analysis/performance-indicators/outcomes/technical

higher education providers make up the base population; student-level data from providers in Wales, Scotland and Northern Ireland has only been used to inform the transfer states in the transition matrix.

Adaptations to the methodology

59. To produce the subject-level rates and improve the suitability of the method for students on non-standard academic years, the following adaptations to the methodology have been made:

    a. Students are associated with their earliest[17] full-time first-degree record at the provider and attributed the subjects from that record, regardless of their current subjects of study. This facilitates projected completion rates of starters in a subject group.
    b. Intercalation has been introduced as a new state in the transition matrix.[18]
    c. Where a student has qualified from full-time first-degree level study in years prior to 2017-18, records for that student at that provider from before the qualification are ignored when identifying starters and assigning subjects to students.
    d. The 1 December census date has been replaced by a bespoke date for each student, based on their start date. A full-time first-degree student is considered in the base population if they have been active for at least 14 days after commencing their course (rather than active after the 1 of December) and transitions are identified with reference to the anniversary of this 14-day point in subsequent academic years.

60. All adaptations have been retained for the provider-level outputs for consistency.

Reliability of the projections

61. The following issues can lead to potentially unstable, unreliable or misleading projected outcomes:

    - Discontinuities in the transition matrix – that is, where there are students entering a (non-sink) state but no students leaving.
    - Small numbers of students in particular states, leading to the outcomes of a few students having a large impact on the final results. This is particularly problematic where there are lots of students entering a state but only a few leaving.
    - Outcomes of students in later years no longer being representative of the likely outcomes of starters.

62. In some cases, such as when there is a discontinuity in the transition matrix, a non-zero proportion of starters are projected an unknown outcome.

[17] The new methodology looks as far back as 2014-15 to find this earliest record. This will not be early enough for all students but should be for a large majority of those contributing to the transition matrix.

[18] Refinements have been introduced to ensure a consistent approach to the treatment of intercalating students when intercalation occurs within the same provider or involves a different provider, which has a positive impact on the outcomes reported for the medicine and dentistry subject area for providers with this provision. While this refinement results in projections that are more representative of these students' outcomes, in looking at the underlying student data we have observed anomalies in data reporting practices related to intercalation periods, which may mean that medicine and dentistry rates remain understated.

63. These issues tend to occur when provision has changed over time and/or the number of students informing the transition matrix is small.

64. To mitigate this risk, completion projections are flagged as potentially unreliable where there are fewer than 250 students informing the transition matrix or more than 5 per cent are projected an unknown outcome. This figure of 250 students informing the transition matrix typically translates to a starting cohort of around 75 students, for three-year programmes. Our experience of the interpretation and construction of the UKPI Table T5 outputs suggests that these thresholds strike an appropriate balance between the utility of the outputs for their intended purposes and the risk of encountering the issues described in paragraph 15. However, it is anticipated that further work will be needed to investigate more sophisticated tests of matrix stability.

Graduate outcomes data: technical notes and known limitations

65. Qualifiers in the 2017-18 academic year have been linked to their responses to the Graduate Outcomes survey.[19] Graduates are sent this survey roughly 15 months after graduation.

66. Graduate Outcomes data has been suppressed where the number of responses is less than 25 and identified as potentially unreliable if the response rate is less than 50 per cent. The response rate requirement adopted here is consistent with that used to determine the reportability of Graduate Outcomes data on the Discover Uni website.

Base population

67. The data is based on UK-domiciled full-time[20] students who qualified with a first degree during 2017-18 and were registered at an English higher education provider, the provider being registered with the OfS on 23 October 2020.

68. Additionally, these students were in the target population for the Graduate Outcomes survey and they had to either fully or partially complete the survey for their responses to have been included in this analysis.

Activity

69. In the survey they were asked which of 11 possible activities they had been doing during the census week and they could respond that they were undertaking multiple ones. Of the ones they identified, they were asked which they felt their most important single activity had been. For simplicity, the responses to the most important activity question (MIMPACT) form the basis of this analysis. We intend to consult on our approach to outcomes measures in due course. The table below shows the possible values of MIMPACT and how they are reported on in the data:

MIMPACT code	MIMPACT label	Destination group(s) reported within	
01	Paid work for an employer	Employed	Known destinations
02	Self-employment/freelancing		

[19] Further information is available at: www.hesa.ac.uk/innovation/outcomes

[20] Apprenticeship students have been counted as full-time.

03	Running my own business		
04	Developing a creative, artistic or professional portfolio		
05	Voluntary/unpaid work for an employer		
06	Engaged in a course of study, training or research	Study	
10	Unemployed and looking for work	Unemployed	
07	Taking time out to travel – this does not include short-term holidays	Other destinations	
08	Caring for someone (unpaid)		
09	Retired		
11	Doing something else		

70. Basing the analysis solely on the most important activity means that any of the other activities they may also have been undertaking in the census week are not taken into account at all, even in cases where one of these would contribute positively to the overall metric but the most important activity does not.

71. The survey includes a question as to whether they have undertaken any further study during the interim 15-month period between qualifying and the census week. These responses have not been considered in this analysis.

Employment

72. Whether a respondent in employment is in professional employment or not is based on the job details that they have provided. Within Graduate Outcomes, jobs are mapped to the Standard Occupational Classification (SOC 2010) and these codes are then grouped into 10 major groupings (XM2010SOC1). The table shows which ones are reported on as being professional[21] and which have been classified as other employment.

XM2010SOC1 code	XM2010SOC1 label	Employment group reported within
1	Managers, directors and senior officials	Professional employment
2	Professional occupations	
3	Associate professional and technical occupations	
4	Administrative and secretarial occupations	Other employment
5	Skilled trades occupations	
6	Caring, leisure and other service occupations	
7	Sales and customer service occupations	
8	Process, plant and machinery operatives	
9	Elementary occupations	

73. In addition to the first three major groupings, veterinary nurses (SOC 2010 unit group 6131) and higher-level teaching assistants (SOC 2010 unit group 6125) have been considered as in

[21] Professional employment may be described a ‘highly skilled employment’ in other contexts.

professional employment. This is consistent with reclassification of these unit groups in SOC 2020.[22]

74. For some providers, some or all their portfolio may mean that their employed graduates are not likely to be in 'professional' jobs according to this classification.

75. In cases where details of a graduate's job have not been provided or cannot be mapped to a SOC code, the response is apportioned between both employment groups in the same ratio between professional and other employment that has been derived for that provider. For example, a provider has 100 respondents that are in employment (with known SOC codes), 35 of these are in professional employment and the remaining 65 are in other employment. In this provider there are also 10 respondents that have identified employment as their main activity but the associated SOC codes are not known. In this case, each of the 10 responses are individually weighted so that each one contributes 0.35 towards the number in professional employment for that provider and also 0.65 towards the number in other employment. It should be noted that these same weightings are used to derive the metrics by subject and the data by graduate location in Annex A, even though the split between professional and other employment for that subject or location will be different to the split by provider.

76. There are 4,538 respondents in the base population with working as their main activity but no SOC code. This is only 3 per cent of all respondents in the population and these cases do not appear to be concentrated in particular providers or subjects, so the assumption outlined above should only have a minor impact.

Further study

77. The type of further study a respondent is undertaking is defined by TYPEQUAL. The table below shows the possible values and whether they are reported within the higher study or other study group. In counting all study as 'further study' for the projected entry to professional employment measure, some study outcomes will be counted positively despite being at a lower level than the original first degree awarded.

TYPEQUAL code	TYPEQUAL label	Study group reported within
01	Higher degree mainly be research (e.g. PhD, DPhil, MPhil, MRes)	Higher study
02	Higher degree, mainly by taught course (e.g. MA, MSc, MBA)	
03	Postgraduate diploma or certificate (including PGCE/PGDE)	
04	Professional qualification	
05	Undergraduate degree (including integrated master's degrees) (e.g. BA, BSc, MBChB, MEng)	
06	Other undergraduate diploma or certificate not specified above	
07	Other qualification	Other study
08	Not aiming for a formal qualification	
blank	NA	

[22] See here for more information about the reclassifications in SOC 2020: www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc/soc2020/soc2020volume1structureanddescriptionsofunitgroups

Further limitations of projected entry to professional employment data

78. Constructing the projected entry to professional employment measure as outlined above fails to count some paths to professional employment or further study positively, such as:

    - students transferring provider before qualifying with a first degree and then gaining professional employment or further study
    - students qualifying at the original provider with another undergraduate qualification before gaining professional employment or further study.

79. For example, 7.8 per cent of medical sciences students are projected to transfer to a different provider and it is likely that a significant proportion of those students would qualify at the new provider and gain professional employment or further study, but the construction of the projected entry to professional employment measure counts the entirety of that 7.8 per cent as having a negative outcome.

80. For the completion projections, students are associated with the subjects that they first studied full-time at first-degree level at the provider, regardless of their subjects in 2017-18, whereas the Graduate Outcomes data is associated with the subjects studied in 2017-18, the year of qualification. There is a discrepancy here as some students change subjects between starting at a provider and qualifying. To investigate the extent of this problem, proportions of 2017-18 qualifiers[23] who started in each CAH2 subject area and qualified in the same subject area or a different subject area are available in Annex B.

[23] 2017-18 qualifiers here are taken to be the group of students entering the 'Qualify First Degree' state of the transition matrix used to project completion rates. Their original subjects of study at the provider are compared with their 2017-18 subjects.

Annex A: Proportions of graduates in professional employment or further study, by location of graduate

Location of graduate (county/ unitary authority level)	Total number of respondents	Proportion in professional employment or further study (%)
Bath and North East Somerset	285	75
Bedford	235	70
Blackburn with Darwen	130	77
Blackpool	190	76
Bracknell Forest	200	80
Brighton and Hove	805	66
Buckinghamshire	580	74
Cambridgeshire	1,310	80
Central Bedfordshire	210	72
Cheshire East	425	67
Cheshire West and Chester	365	66
City of Bristol	1,995	74
City of Derby	640	75
City of Kingston upon Hull	305	80
City of Leicester	795	71
City of Nottingham	1,320	74
City of Plymouth	550	73
City of Portsmouth	470	78
City of Southampton	685	75
City of Stoke-on-Trent	275	78
City of York	535	67
Cornwall	430	65
County Durham	440	78
Cumbria	420	69
Darlington	180	67
Derbyshire	555	70
Devon	795	72
Dorset	255	72
East Riding of Yorkshire	215	69
East Sussex	380	72
Essex	1,440	72
Gloucestershire	935	75
Greater London	30,055	77
Greater Manchester	5,815	73
Halton	125	76
Hampshire	1,480	73
Hartlepool	75	78

Location of graduate (county/ unitary authority level)	Total number of respondents	Proportion in professional employment or further study (%)
Herefordshire	135	69
Hertfordshire	1,715	72
Isle of Wight	90	80
Kent	1,610	69
Lancashire	1,275	70
Leicestershire	700	70
Lincolnshire	885	70
Luton	365	69
Medway	210	82
Merseyside	2,310	69
Middlesbrough	255	76
Milton Keynes	630	76
Norfolk	1,040	71
North East Lincolnshire	80	77
North Lincolnshire	80	73
North Somerset	130	65
North Yorkshire	645	71
Northamptonshire	865	73
Northumberland	185	79
Nottinghamshire	585	75
Oxfordshire	1,360	79
Peterborough	340	80
Reading	615	81
Redcar and Cleveland	60	72
Rutland	30	73
Shropshire	225	68
Slough	285	79
Somerset	375	73
South Gloucestershire	375	80
South Yorkshire	2,235	74
Southend-on-Sea	135	73
Staffordshire	800	67
Stockton-on-Tees	140	79
Suffolk	720	74
Surrey	1,750	75
Swindon	355	80
Telford and Wrekin	135	79
Thurrock	85	68
Torbay	75	80
Tyne and Wear	1,590	73
Warrington	430	77
Warwickshire	755	77
West Berkshire	220	83

Location of graduate (county/ unitary authority level)	Total number of respondents	Proportion in professional employment or further study (%)
West Midlands	5,225	75
West Sussex	970	74
West Yorkshire	4,100	73
Wiltshire	405	72
Windsor and Maidenhead	170	73
Wokingham	220	80
Worcestershire	680	69

Annex B: Proportions of qualifiers in the original subject group and different subject group, by original subject group

Original CAH2 subject group	Original subject name	Total number of qualifiers	Proportion of qualifiers in the original subject group (%)	Proportion of qualifiers in a different subject group (%)
CAH01-01	Medicine and dentistry	5,750	99.5	0.5
CAH02-02	Pharmacology, toxicology and pharmacy	2,730	97.4	2.6
CAH02-04	Nursing and midwifery	17,975	99.4	0.6
CAH02-05	Medical sciences	2,695	94.6	5.4
CAH02-06	Allied health	8,855	95.9	4.1
CAH03-01	Biosciences	10,285	94.2	5.8
CAH03-02	Sport and exercise sciences	8,130	98.4	1.6
CAH04-01	Psychology	12,605	97.1	2.9
CAH05-01	Veterinary sciences	850	99.2	0.8
CAH06-01	Agriculture, food and related studies	1,810	94.9	5.1
CAH07-01	Physics and astronomy	3,080	97.2	2.8
CAH07-02	Chemistry	3,600	93.7	6.3
CAH07-04	General, applied and forensic sciences	1,465	88.3	11.7
CAH09-01	Mathematical sciences	5,630	96.0	4.0
CAH10-01	Engineering	12,255	96.8	3.2
CAH10-03	Materials and technology	1,130	95.1	4.9
CAH11-01	Computing	10,695	96.3	3.7
CAH13-01	Architecture, building and planning	3,875	96.0	4.0
CAH15-01	Sociology, social policy and anthropology	9,810	95.7	4.3
CAH15-02	Economics	5,885	96.2	3.8
CAH15-03	Politics	4,805	96.8	3.2
CAH15-04	Health and social care	4,935	94.9	5.1
CAH16-01	Law	10,590	96.8	3.2
CAH17-01	Business and management	28,460	97.9	2.1
CAH19-01	English studies	9,630	97.0	3.0
CAH19-02	Celtic studies	15	-	-
CAH19-04	Languages and area studies	3,970	94.8	5.2
CAH20-01	History and archaeology	10,155	97.5	2.5
CAH20-02	Philosophy and religious studies	3,080	96.3	3.7
CAH22-01	Education and teaching	11,765	98.1	1.9
CAH23-01	Combined and general studies	645	68.0	32.0

Original CAH2 subject group	Original subject name	Total number of qualifiers	Proportion of qualifiers in the original subject group (%)	Proportion of qualifiers in a different subject group (%)
CAH24-01	Media, journalism and communications	7,865	95.5	4.5
CAH25-01	Creative arts and design	18,995	97.0	3.0
CAH25-02	Performing arts	11,405	98.7	1.3