ABCS: Associations Between Characteristics of Students

Access measure

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Introduction to ABCS

1. Associations between characteristics of students (ABCS) provides a set of measures which aims to improve our understanding of the outcomes different groups of people are likely to experience across the student lifecycle. We define groups of people by looking at a set of characteristics so that we can determine the effect of not just one characteristic on an outcome, but the effect of multiple characteristics. ABCS access is one of these measures.

2. To accompany this report, an interactive dashboard is provided to allow the user to explore the results for the ABCS access measure.[1]

What does ABCS access measure?

3. ABCS access measures the proportion of 18- or 19-year-olds entering higher education (sometimes referred to as young participation). Data regarding these students is taken from the Department for Education's National Pupil Database (NPD) from the summer in which they obtained their key stage four (KS4) qualifications – most commonly GCSEs. We have then tracked these students through to the start of higher education, where we can determine whether they are in the higher education records two or three years later at the age of 18 or 19. This will capture any level or mode of study in higher education.

Population

4. We have taken data for English-domiciled pupils who obtained their KS4 qualifications in state-funded mainstream schools in the summers of 2013, 2014, 2015, 2016 and 2017 (that is, in the academic years 2012-13 to 2016-17) from the NPD. Using KS4 cohorts up to 2016-17 allows us to capture the most recent 18- and 19-year-old entrants into higher education in the academic year 2020-21. We use KS4 cohorts because they give almost complete coverage of all 16-year-olds in England. In addition, combining data from five cohorts allows us to carry out robust analysis, ensuring that there are sufficient students in each of the characteristic groups to allow us to carry out analysis regarding their access behaviour.

5. Students who attended independent schools are not included in the access measure because not all of the same characteristic data is collected for them as for those who attended state-funded mainstream schools. However, analysis shows that the access rate for this pupil group as a whole is so high that they would be placed in access quintile 5: across the five most recent cohorts, access rates for these students range from 72.3 per cent to 72.6 per cent, which according to Table 3 puts them in access quintile 5.

6. For details of how we define mainstream and independent schools, see the school types section in the ABCS methodology document.[2]

[1] See www.officeforstudents.org.uk/data-and-analysis/associations-between-characteristics-of-students/.

[2] See www.officeforstudents.org.uk/data-and-analysis/associations-between-characteristics-of-students/.

Successful outcomes

7. We consider any entry to higher education to be a successful outcome, irrespective of mode or level of study. We are only able to identify higher education study where it occurs in providers where we have individual-level data, namely those providers that return data to the Higher Education Statistics Agency student and student alternative records and the Education and Skills Funding Agency individualised learner record. This is a deliberately broad definition, as our focus is on the outcomes of school pupils, rather than any particular group of students. However, there are some cases that we would not count as a successful outcome, which include study that is not on a higher education aim, or an individual leaving their higher education course within the first two weeks. We use the exclusions listed in the OFSHE section in the student outcome and experience measures core algorithms document.[3]

Selection of characteristics

8. In selecting the characteristics for use in the access model, as well as having good availability of data, we were looking for characteristics that should not influence a person's likelihood of entering higher education, but where the evidence showed that they did.

9. The six characteristics used in the access model are as follows: ethnicity, free school meal (FSM) eligibility, gender, income deprivation affecting children index (IDACI) index of multiple deprivation (IMD) and TUNDRA.[4] [5] These last three area-based characteristics are based on the individual's home postcode recorded at KS4.

10. All six characteristics had enough pupils in each attribute group that meant they could all be treated as separate groups when used for the modelling data.

11. The model includes data on 2,701,410 school pupils, 1,165,955 of which entered higher education aged 18 or 19. Table 1 shows the categories within each of the six characteristics used for the model and the number and proportion of the pupils who are in each of these categories.

Table 1: Characteristics in the ABCS access model

Characteristic	Category	Total number of individuals in the five cohorts	Per cent
Ethnicity	Any other Asian background	39,460	1.5%
	Any other black background	15,505	0.6%
	Any other ethnic group	37,645	1.4%
	Any other mixed background	38,300	1.4%

[3] See https://www.officeforstudents.org.uk/data-and-analysis/student-outcome-and-experience-measures/documentation/ (Technical algorithms for student outcome and experience measures: September 2022 core algorithms).

[4] IMD and IDACI: see www.gov.uk/government/statistics/english-indices-of-deprivation-2019.

[5] TUNDRA: see www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/about-tundra/.

	Any other white background	108,735	4.0%
	Bangladeshi	39,985	1.5%
	Black - African	81,220	3.0%
	Black Caribbean	36,470	1.3%
	Chinese	9,830	0.4%
	Gypsy, Roma or Traveller	5,530	0.2%
	Indian	66,875	2.5%
	Pakistani	95,425	3.5%
	Refused or unknown	48,820	1.8%
	*White - British	1,997,450	73.9%
	White - Irish	8,890	0.3%
	White and Asian	23,600	0.9%
	White and black African	12,305	0.5%
	White and black Caribbean	35,370	1.3%
FSM eligibility	Eligible for FSM	696,735	25.8%
	*Not eligible for FSM	1,973,700	73.1%
	Unknown or N/A	30,975	1.1%
Gender	*Female	1,337,455	49.5%
	Male	1,363,955	50.5%
IDACI	Quintile 1 (most deprived)	607,880	22.5%
	Quintile 2	554,730	20.5%
	Quintile 3	516,855	19.1%
	Quintile 4	501,910	18.6%
	*Quintile 5 (least deprived)	485,040	18.0%
	Unknown or N/A	35,000	1.3%
IMD	Quintile 1 (most deprived)	613,605	22.7%
	Quintile 2	540,475	20.0%
	Quintile 3	505,110	18.7%
	Quintile 4	493,700	18.3%
	*Quintile 5 (least deprived)	513,520	19.0%
	Unknown or N/A	35,000	1.3%
TUNDRA	Quintile 1 (lowest participation in higher education)	527,820	19.5%
	Quintile 2	530,525	19.6%
	Quintile 3	532,120	19.7%
	Quintile 4	535,465	19.8%
	*Quintile 5 (highest participation in higher education)	538,230	19.9%

	Unknown or N/A	37,255	1.4%
Total number of individuals		2,701,410	100%

* Indicates a reference category in the statistical model

The statistical model

12. We have used a binary logistic regression model to predict the probability of a pupil entering higher education. We have included all six characteristics as main effects and used a statistical approach (stepwise) to determine which of the two-way interactions should be included. See the ABCS methodology document for details.[6] This has resulted in the inclusion of the following interactions shown in Table 2.

Table 2: Interactions in the ABCS access model

Interactions
Gender*FSM eligibility
Gender*Ethnicity
Gender*IMD
Gender*TUNDRA
Ethnicity*FSM eligibility
Ethnicity*IDACI
Ethnicity*IMD
Ethnicity*TUNDRA
IDACI*FSM eligibility
IMD*FSM eligibility
IMD*IDACI
TUNDRA*FSM eligibility
TUNDRA*IDACI
TUNDRA*IMD

13. The model is:

$$logit(\pi_i) = \beta_0 + \tilde{\beta}_1 ethnicity_i + \tilde{\beta}_2 IDACI_i + \tilde{\beta}_3 IMD_i + \tilde{\beta}_4 FSM_i + \tilde{\beta}_5 gender_i + \tilde{\beta}_6 TUNDRA_i + interactions$$

Where i is an individual, πi is a binary response variable which takes the value of 1 if the individual accessed higher education aged 18 or 19 and 0 otherwise, β represents vectors of different sizes and the interactions are as listed above.

[6] See www.officeforstudents.org.uk/data-and-analysis/associations-between-characteristics-of-students/.

Model results

14. The coefficient estimates for each of the factors and for all the two-way interactions included in the final model can be found in the Excel/CSV files.[7]

Derivation of ABCS access quintiles

15. Using the model's predicted access rates for each of the pupil groups, we then used these predicted rates to split the pupils included in the modelling into five quintiles. Those groups with the lowest modelled rates are in the lowest access quintile and those with the highest are in the highest access quintile. Table 3 shows the number and proportion of pupils in each quintile, as well as the mean, minimum and maximum predicted access rate. The minimum predicted rates are also the breakpoints, which determine the quintile boundaries.

Table 3: Description of ABCS access quintiles

Access quintile	Number of students	Proportion of students	Mean modelled access rate	Minimum modelled access rate	Maximum modelled access rate
Quintile 1	538,255	19.9%	18.0%	0.1%*	26.4%
Quintile 2	542,200	20.1%	32.7%	26.4%	38.5%
Quintile 3	543,240	20.1%	43.4%	38.5%	48.2%
Quintile 4	537,750	19.9%	53.7%	48.2%	59.9%
Quintile 5	539,970	20.0%	68.0%	59.9%	93.7%

* This low modelled access rate is based on a small group and may not reflect their observed access rate.

[7] See www.officeforstudents.org.uk/data-and-analysis/associations-between-characteristics-of-students/.