

# TUNDRA methodology

## What is TUNDRA?

1. TUNDRA (Tracking Underrepresentation by Area) is an area-based measure of young participation in higher education at age 18 or 19 for state-funded mainstream school students in England.<sup>1</sup>
2. It classifies local areas across England (using Middle Super Output Area (MSOA) for TUNDRA MSOA and Lower Super Output Area (LSOA) for TUNDRA LSOA) according to the young participation rate in higher education.
3. TUNDRA uses data-linking to track cohorts of 16 year old state-funded mainstream school pupils in MSOAs in England who completed their GCSEs (Key stage 4) in the summer of 2012 to 2016, and match them to higher education records from academic years 2014-15 to 2019-20 when they would have been 18 or 19.
4. The young participation rate for each local area is calculated based on cohorts of state-funded mainstream school pupils completing Key stage 4 at age 16. If individuals in the cohort are found to be in higher education two or three years later, at age 18 or 19, they are considered to be young participants. To calculate the young participation rate of 16 year olds for each local area, the number of young participants is divided by the original number of Key stage 4 pupils in the area.
5. Each local area is then ranked according to its young participation rate and assigned equally across five quintiles, where quintile one areas have the lowest participation rates and quintile five areas have the highest participation rates. The quintiles used in the classification apply to the local area and not to each individual.

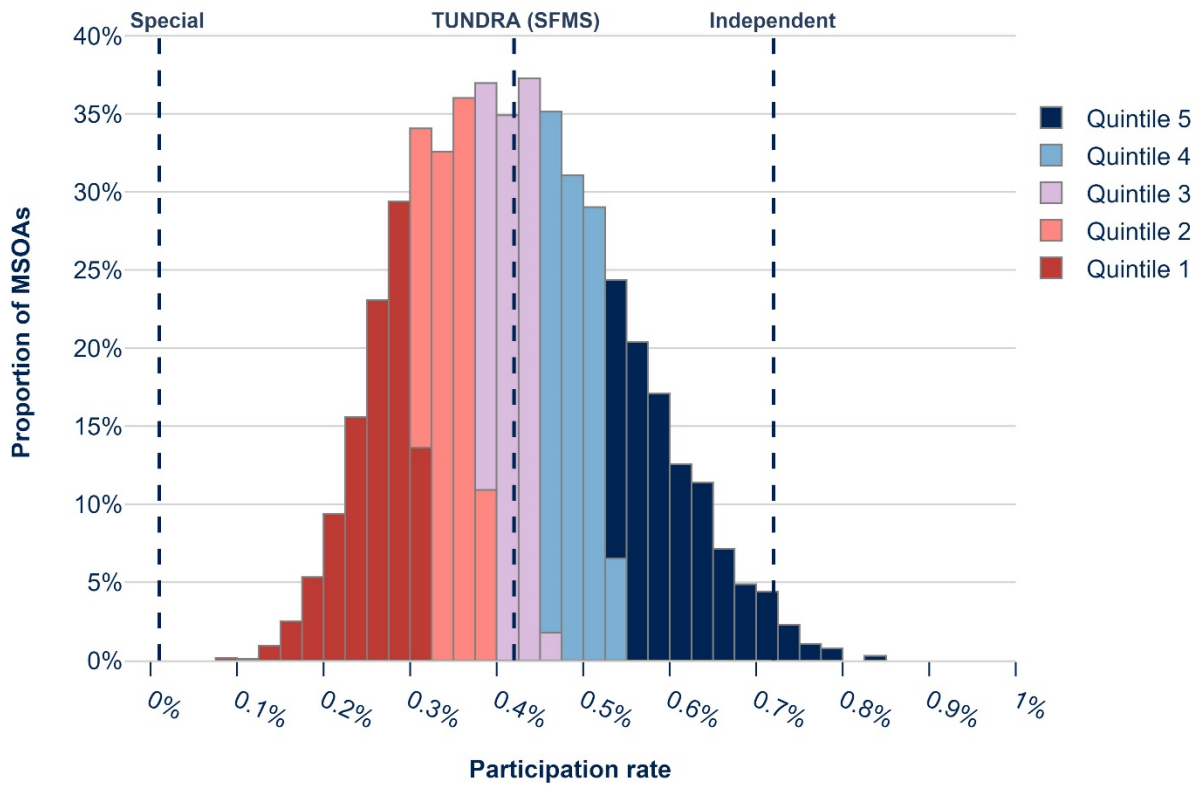
## State-funded mainstream schools focus

6. Although similar to POLAR4, TUNDRA follows a different approach and only takes into account the participation rates of students from state-funded mainstream schools in England.
7. Figure 1 displays the TUNDRA MSOA quintiles with the average young participation rate of English state-funded mainstream schools (SFMS) in the centre, while figure 2 shows the same for TUNDRA LSOA quintiles. For comparison, both figures 1 and 2 also display the average young participation rates for English special schools and independent schools. However this data was not included in when producing histograms.

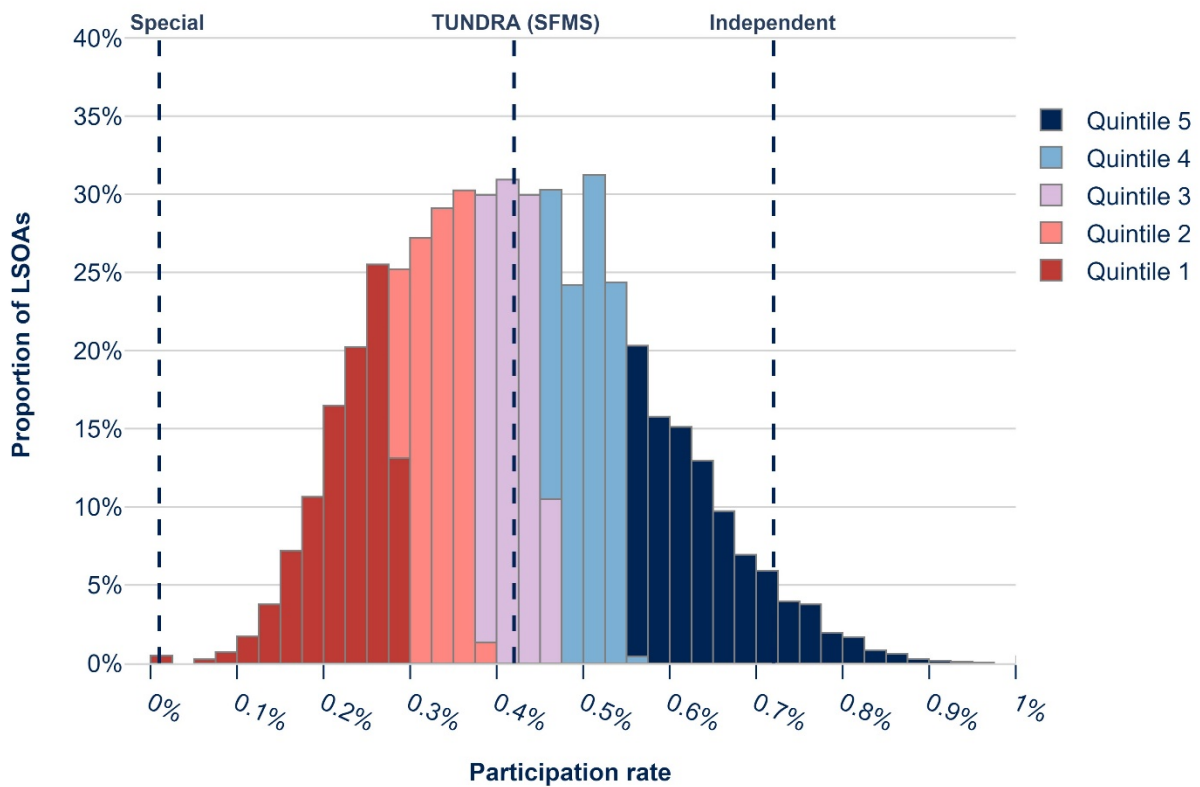
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<sup>1</sup> As described in the Department for Education publication 'Widening Participation in Higher Education, England, 2016/17 age cohort: Technical Note' available at [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/757900/WP2018-TechnicalNote.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757900/WP2018-TechnicalNote.pdf)

**Figure 1: Proportion of MSOAs with different participation rates by TUNDRA quintiles**



**Figure 2: Proportion of LSOAs with different participation rates by TUNDRA quintiles**



- By identifying young participation rates specific to state-funded mainstream school pupils, TUNDRA can provide a more refined young participation targeting tool for underrepresented groups in higher education, such as outreach programmes.

## How is TUNDRA calculated?

### Formula for TUNDRA

- The formula for the TUNDRA classification is as follows:

$$YPR_{\text{area}} = \frac{\text{number of young participants from state funded mainstream schools in the area}}{\text{total number of KS4 pupils in state funded mainstream schools in the area}}$$

- The area used for the TUNDRA MSOA classification is the Middle Super Output Area (MSOA), and the area used for the TUNDRA LSOA classification is the Lower Super Output Area (LSOA). The underlying methodology is the same for both classifications.
- The sections below describe the populations used for both the denominator and numerator in the TUNDRA calculation and provide further information about how they are derived.

### Data sources

- The base population for TUNDRA comes from the National Pupil Database.<sup>2</sup> This is a collection of pupil data from schools maintained by the Department for Education.<sup>3</sup> Information is recorded on personal characteristics and qualifications achieved for all students taking exams in key stage 4 (KS4) qualifications (GCSE level).
- Data on university study is sourced from the Higher Education Statistics Agency (HESA) Student and Alternative Provider (AP) Student records, and data on higher education study at colleges is taken from the Individualised Learner Record.<sup>4,5,6</sup> These record personal and course characteristics for students taking higher education qualifications.

### Population: key stage 4 pupils

- The population used as the denominator to calculate young participation rates is the total number of key stage 4 (KS4) (GCSE level) pupils in each MSOA. The specific criteria to determine whether pupils are included as part of the KS4 population are as follows:
  - Pupils must attend a state-funded mainstream school located in England and live in an MSOA in England (definition given by Department for Education, location determined by home postcode).<sup>7</sup>
  - Pupils must be 16 years old in the academic year of their key stage 4 completion.

<sup>2</sup> See <https://www.gov.uk/government/collections/national-pupil-database>

<sup>3</sup> The Department for Education do not accept responsibility for any inferences or conclusions derived from the NPD data by third parties.

<sup>4</sup> See <https://www.hesa.ac.uk/collection/c17051>

<sup>5</sup> See <https://www.hesa.ac.uk/collection/c17054>

<sup>6</sup> See <https://www.gov.uk/government/collections/individualised-learner-record-ilr>

<sup>7</sup> As described in the Department for Education publication 'Widening Participation in Higher Education, England, 2016/17 age cohort: Technical Note' available at

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/757900/WP2018-TechnicalNote.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/757900/WP2018-TechnicalNote.pdf)

- Pupils must be part of the national roll, an indicator that data for the pupil is fit for statistical calculations.
15. The KS4 population form the basis of the population for each MSOA. This is because KS4 is the last educational stage before higher education where data maintains a near whole population coverage. All state-funded mainstream schools in England deliver KS4 GCSE qualifications and this data is collected in a consistent way on the National Pupil Database (NPD).

### **Tracking: linking between key stage 4 and higher education**

16. To determine whether individuals who have completed KS4 participate in higher education, data from the National Pupil Database (NPD) is linked to the OfS dataset, which includes students that study at UK higher education providers (data sourced from the Higher Education Statistics Agency, HESA) and students that study higher education at English further education providers (data sourced from Individual Learner Record).
17. An individual is categorised as a young participant if they are matched to a higher education record two or three years after the year of their KS4 completion. This is because we are measuring a cohort participation rate and by extending the definition to include more mature participation would require using historical cohorts from ten or more years ago. Therefore, individuals who are not matched to any higher education records at age 18 or age 19 are not considered young participants for this particular measure. A match means that an individual is found in the higher education records from a UK higher education provider recognised by HESA, or an English further education provider covered by the Individualised Learner Record (ILR).<sup>8</sup> This population is used as the numerator in the TUNDRA formula to calculate the young participation rate.

### **Participation rates and quintiles for each area**

18. Once all individuals in the NPD dataset (KS4) are identified as either a young participant or not, the young participation rate for each area is calculated by dividing the number of young higher education participants in the area by the total number of KS4 pupils in state-funded mainstream schools in the same area.
19. However, it should be noted that each area has a different number of young people in the area. Some MSOAs may contain only a few pupils which could lead to statistically unstable young participation rates which could fluctuate from year to year.
20. Two approaches have been taken in order to correct for this issue:
- a. Aggregating five years of data instead of calculating young participation rates for individual years.
  - b. Suppressing (excluding) areas which have a small population after aggregating five years of data (total population of fewer than 50 people for MSOA and fewer than 30 people for LSOA). This also mitigates the risk of statistical disclosure of individuals (or their particular outcomes).
21. Aggregating five years of data increases the total population for each area and results in fewer areas being suppressed. Despite this, some areas still have fewer than specified KS4

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<sup>8</sup> Matches are made using fuzzy matching using individualised student information and characteristics.

pupils in state-funded mainstream schools in the area and are therefore suppressed. Further details about the suppression methodology is available on our website.<sup>9</sup>

22. After aggregating five years of data, young participation rates are calculated for each area. The areas are then ranked in order of their young participation rates, from lowest to highest, and then segregated into approximately equal quintiles. Each quintile contains approximately 20 per cent of the population. Quintile one areas have the lowest participation rates and quintile five areas have the highest participation rates.
23. Table 1 shows the minimum, maximum, mean and range of participation rates within each of the TUNDRA quintiles (Table 1a for MSOA and Table 1b for LSOA).

**Table 1a: Participation rates of TUNDRA MSOA quintiles**

Quintile	Minimum	Maximum	Mean	Range
1	8.7%	31.1%	25.9%	22.4%
2	31.1%	38.2%	34.7%	7.1%
3	38.2%	45.2%	41.6%	7.0%
4	45.2%	53.1%	48.9%	7.9%
5	53.1%	84.8%	60.1%	31.8%

**Table 1b: Participation rates of TUNDRA LSOA quintiles**

Quintile	Minimum	Maximum	Mean	Range
1	8.7%	31.1%	25.9%	22.4%
2	31.1%	38.2%	34.7%	7.1%
3	38.2%	45.2%	41.6%	7.0%
4	45.2%	53.1%	48.9%	7.9%
5	53.1%	84.8%	60.1%	31.8%

24. The distribution of these quintiles are different across regions. Table 2a displays the proportion of MSOAs of each region in each TUNDRA MSOA quintile, and table 2b displays the proportion of LSOAs of each region in each TUNDRA LSOA quintile.

**Table 2a: TUNDRA MSOA quintiles by regions**

Region	Q1	Q2	Q3	Q4	Q5
East Midlands	26.6%	22.4%	22.6%	18.1%	10.3%
East of England	23.6%	23.0%	21.4%	18.8%	13.3%
London	0.8%	4.2%	7.7%	26.8%	60.5%
North East	23.8%	28.5%	16.5%	14.4%	16.8%
North West	18.8%	20.6%	17.8%	22.2%	20.7%
South East	19.8%	18.8%	23.3%	21.0%	17.1%
South West	24.5%	27.0%	24.5%	16.5%	7.5%
West Midlands	17.5%	21.3%	23.7%	22.0%	15.6%
Yorkshire and The Humber	24.1%	20.1%	24.5%	16.5%	14.9%

<sup>9</sup> See [www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/about-the-data/](http://www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/about-the-data/)

**Table 2b: TUNDRA LSOA quintiles by regions**

Region	Q1	Q2	Q3	Q4	Q5
East Midlands	25.6%	22.8%	21.5%	16.9%	13.1%
East of England	21.6%	25.4%	21.8%	15.5%	15.7%
London	1.9%	5.1%	13.6%	28.6%	50.9%
North East	25.8%	23.2%	17.4%	16.2%	17.4%
North West	19.1%	20.7%	18.7%	20.1%	21.3%
South East	18.9%	21.1%	21.0%	18.9%	20.1%
South West	25.2%	24.5%	22.6%	16.6%	11.1%
West Midlands	18.6%	20.2%	22.4%	21.9%	16.9%
Yorkshire and The Humber	23.4%	20.7%	21.3%	18.9%	15.7%

## Explore TUNDRA

25. To explore the TUNDRA classification further and find out the young participation rates for specific local areas, please visit the young participation map and postcode look-up located on the OfS webpage.<sup>10</sup>

## Feedback

23. We are keen to receive any feedback about the TUNDRA methodology and its usefulness for targeting areas where state-funded mainstream pupils are underrepresented in higher education. Please contact us at [Norra.Tengcharoensuk@officeforstudents.org.uk](mailto:Norra.Tengcharoensuk@officeforstudents.org.uk) or [official.statistics@officeforstudents.org.uk](mailto:official.statistics@officeforstudents.org.uk).

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<sup>10</sup> See <https://www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/>