The knock-on effect of socioeconomic attainment gaps in mathematics

Diversity & Decolonisation in Mathematics and its Applications Conference
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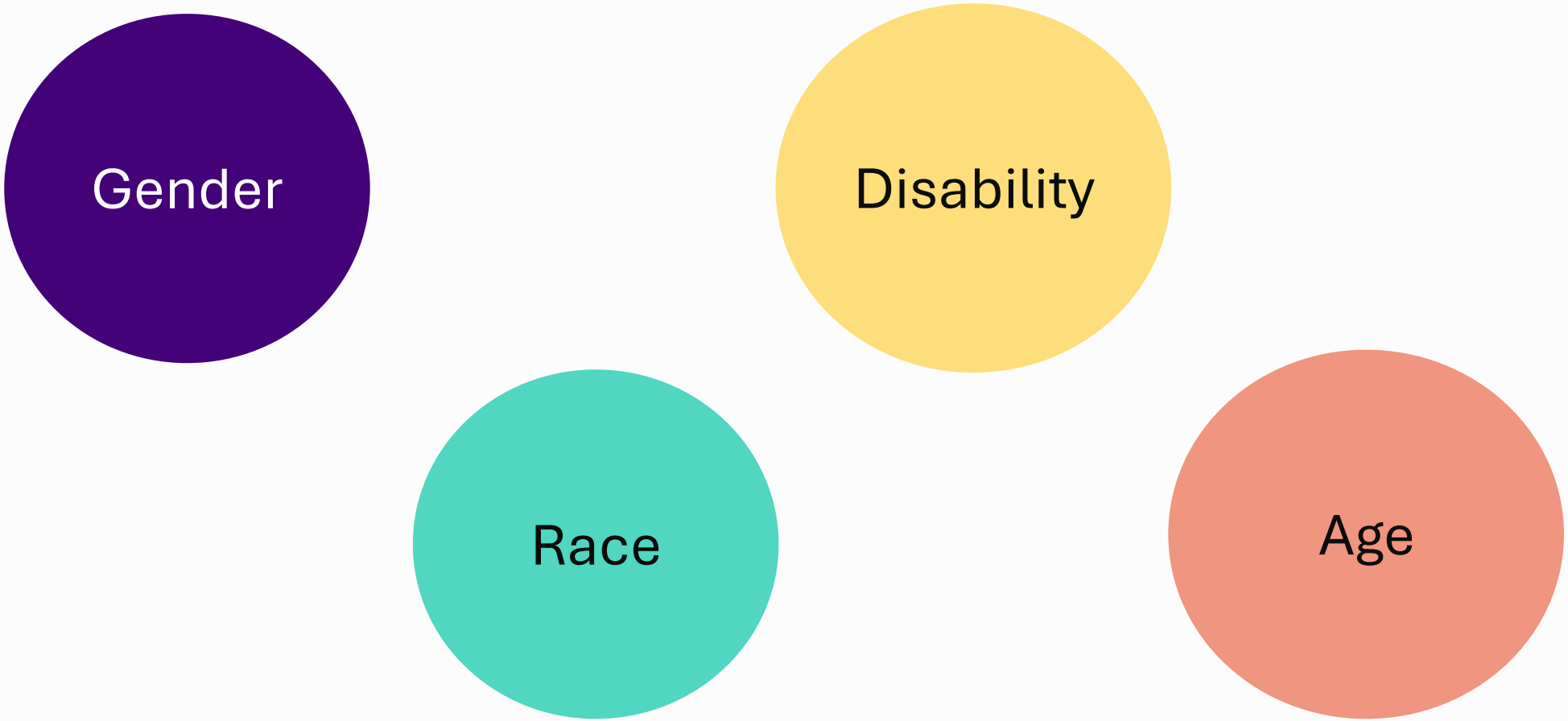
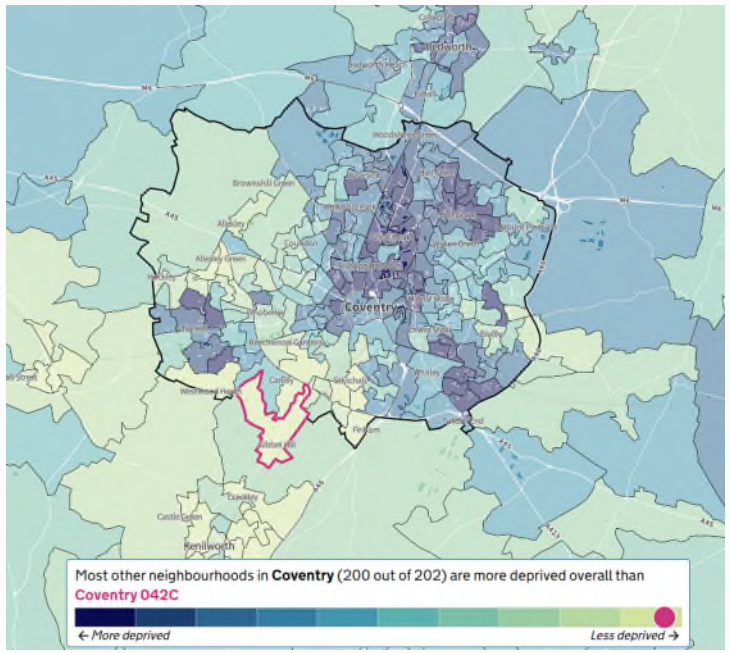
When we think about underrepresented groups, we often think about...



Defining socioeconomic status

Index of Multiple Deprivation (IMD)

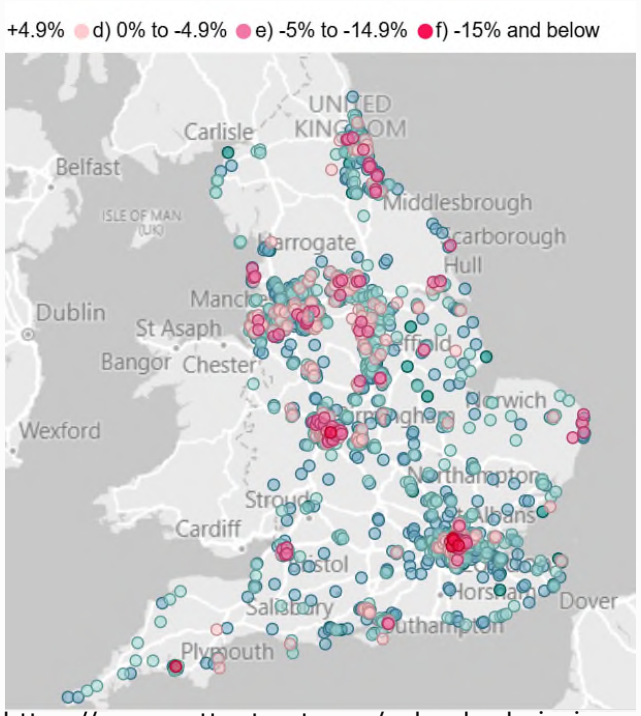
- The official measure of relative deprivation in England based on several indicators.
- Areas of the country are rated on these indicators and then ranked by highest to lowest levels of deprivation.



https://deprivation.communities.gov.uk/

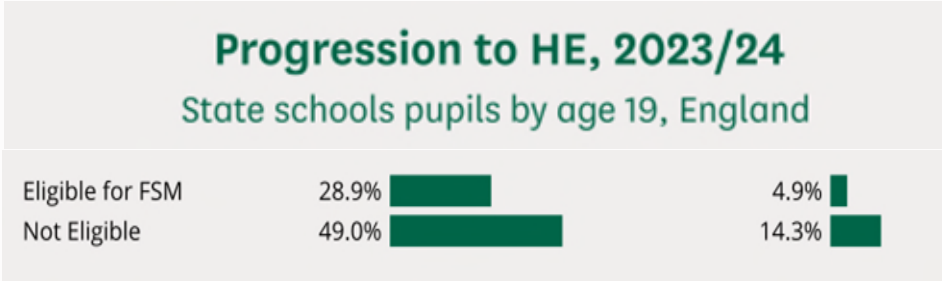
Free School Meal Eligibility (FSM)

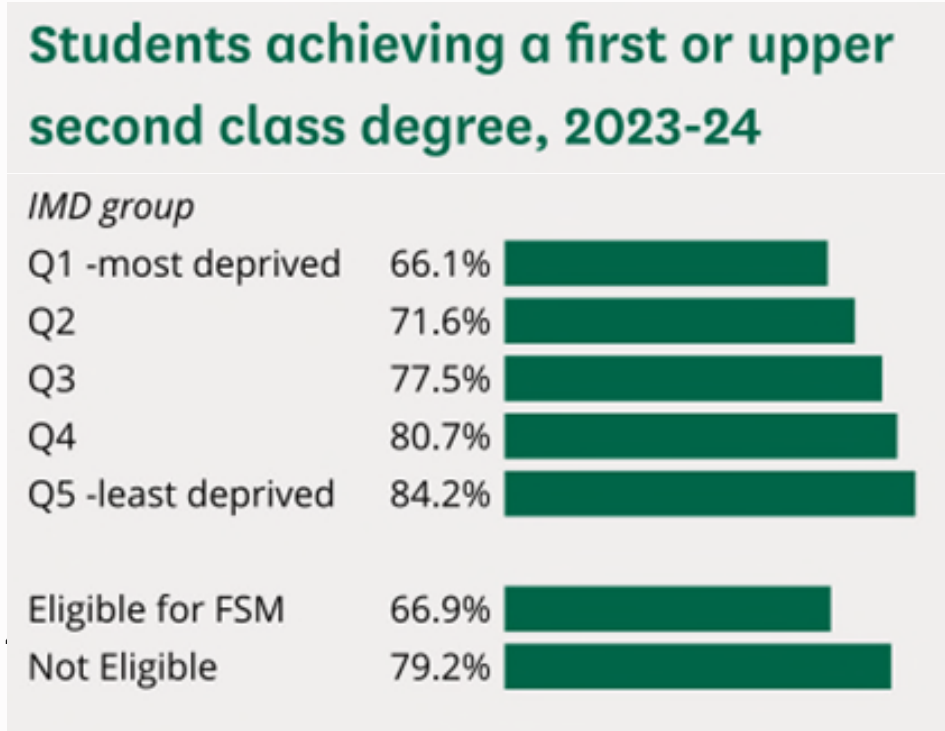
- All children in state-funded schools are eligible for Free School Meals in reception, year 1 and year 2.
- From year 3, students are eligible only if their parents/carers are in receipt of means-tested benefits tied to low household income.

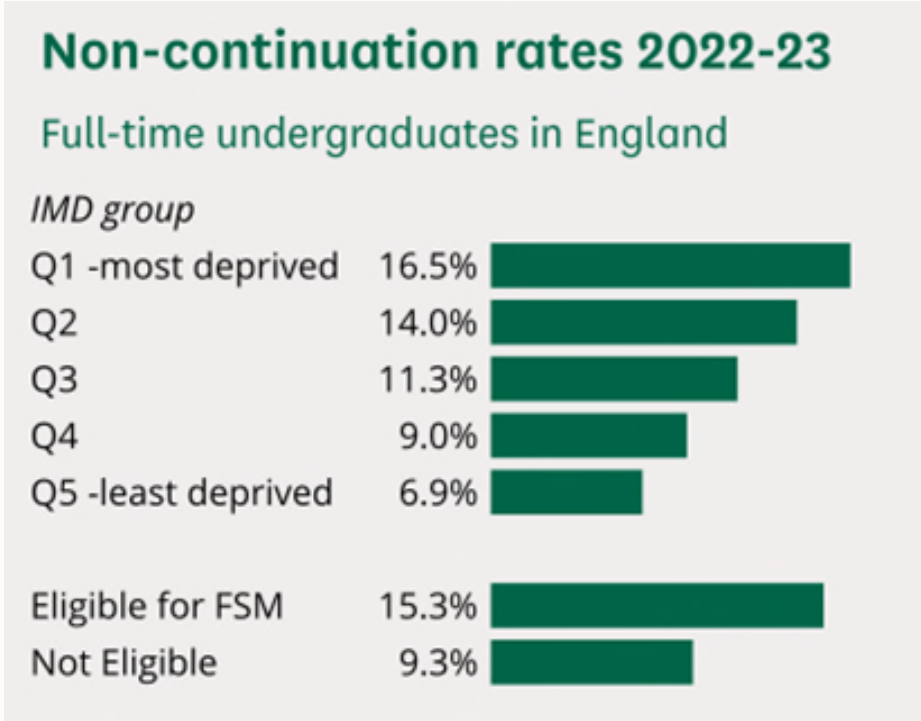


https://www.suttontrust.com/school-admissions-dashboard/

Access and attainment gaps based on measures of disadvantage





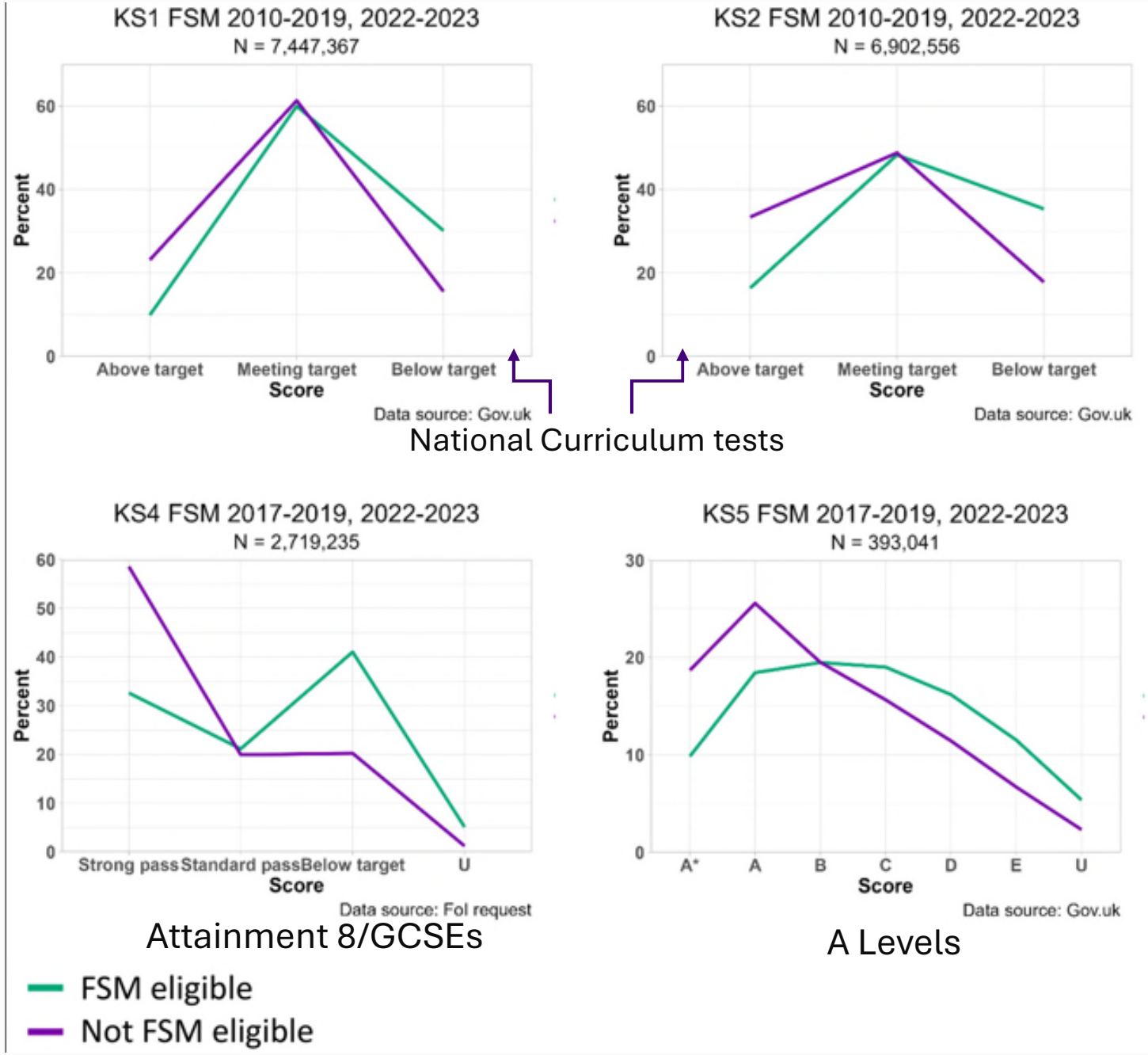


*FSM = Free School Meals
**IMD = Index of Multiple Deprivation

https://commonslibrary.parliament.uk/research-briefings/cbp-9195/

But when does this start?

- Like gender, access gaps for students from low SES begin young – around 5 years old
- Some research suggests that attainment gaps in mathematical ability are evident before children even start primary school and widen over time.
- Intersectional demographic variables compound on these gaps and many factors contribute to them, such as home and school environments.



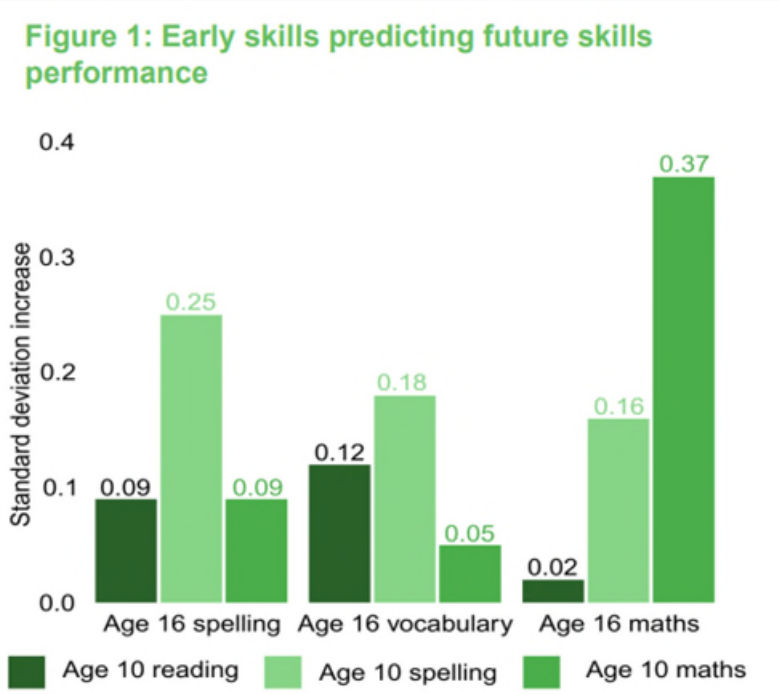
https://pmc.ncbi.nlm.nih.gov/articles/PMC10953023/
https://bera-journals.onlinelibrary.wiley.com/doi/10.1002/berj.4117

Why is this important?

"Maths skills measured at a variety of ages in childhood are strongly associated with later life outcomes, and in many cases, more strongly associated than other skills."

What does this mean in reality?

By **age 10**, we can predict outcomes for A levels, entry into HE, and graduate outcomes – all based on early mathematical skills development



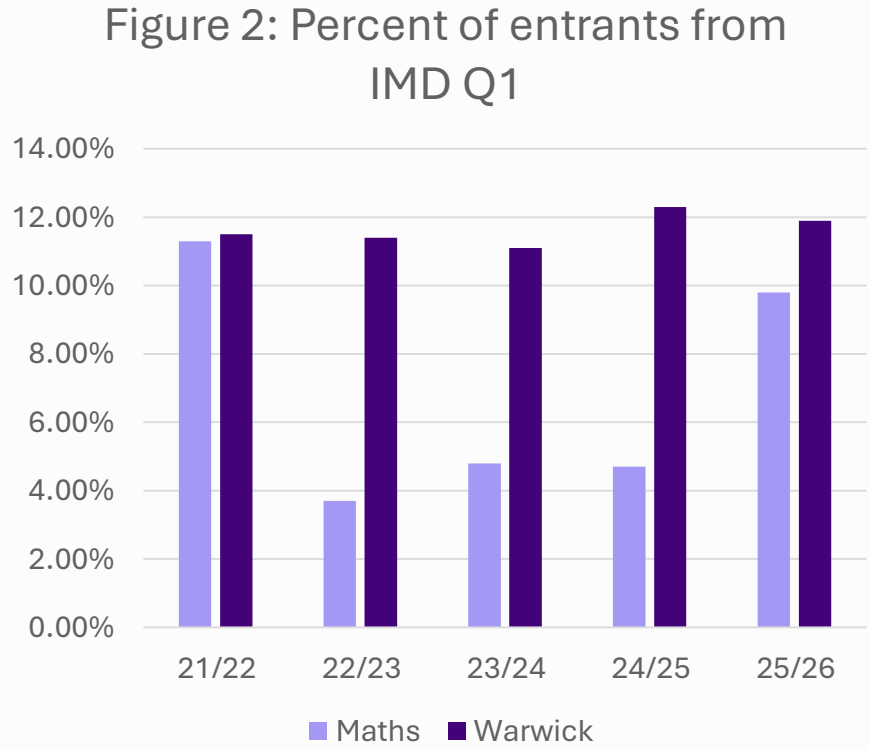
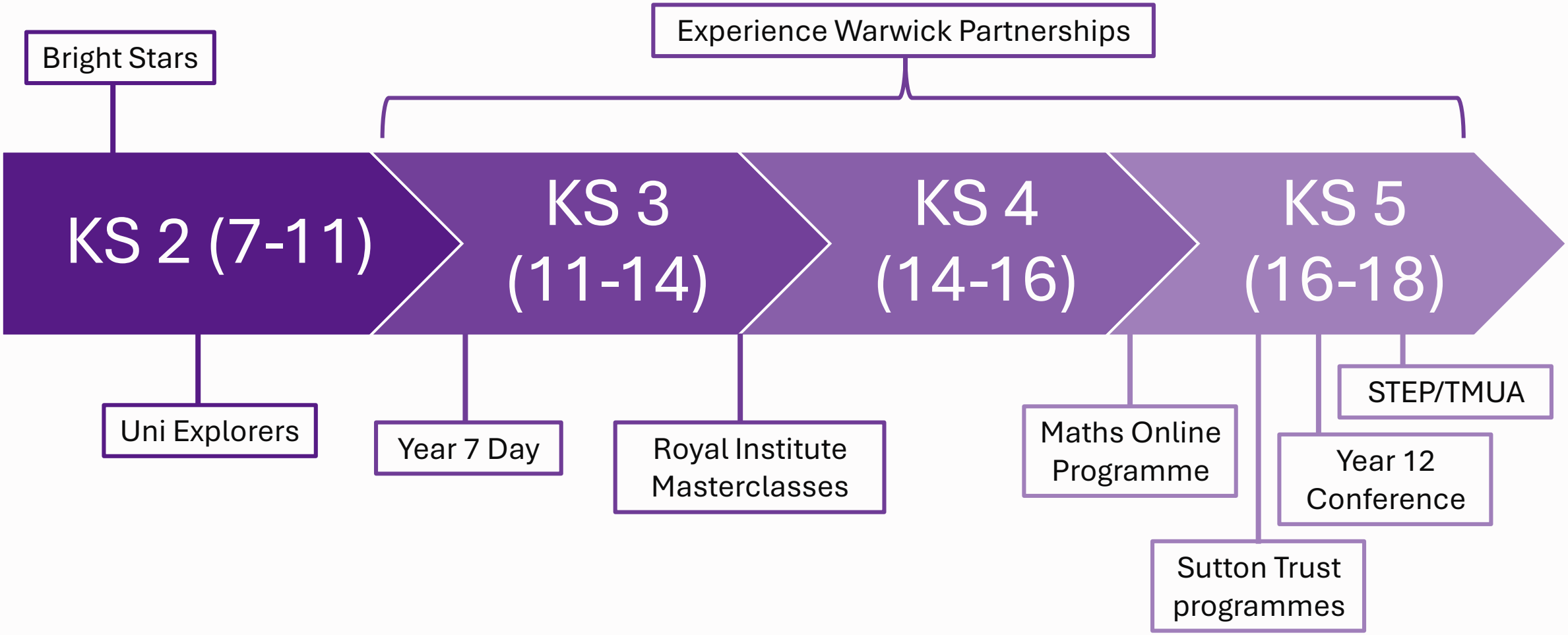


Figure 3: Graduate outcomes by SES

	Full-time employment	Part-time employment	Unknown pattern of employment	Voluntary or unpaid work	Employment and further study	Full-time further study	Part-time further study	Unknown pattern of further study	Other including travel, caring for someone or retired	Unemployed	Total with known outcomes	Non-respondents	Total
English Index of Multiple Deprivation (IMD)													
Quintile 1 – most deprived (IMD)	14,750	4,310	195	425	3,295	1,620	170	20	2,460	2,660	**29,895**	28,575	**58,470**
Quintile 2 (IMD)	15,920	4,290	190	470	3,390	1,750	170	20	2,350	2,370	**30,925**	29,580	**60,500**
Quintile 3 (IMD)	16,575	4,195	180	430	3,355	1,930	145	20	2,030	1,940	**30,800**	28,715	**59,515**
Quintile 4 (IMD)	18,215	4,010	155	380	3,655	2,210	120	15	1,905	1,920	**32,575**	29,685	**62,260**
Quintile 5 – least deprived (IMD)	21,610	4,345	175	465	4,205	2,745	130	10	2,065	2,060	**37,815**	33,795	**71,605**

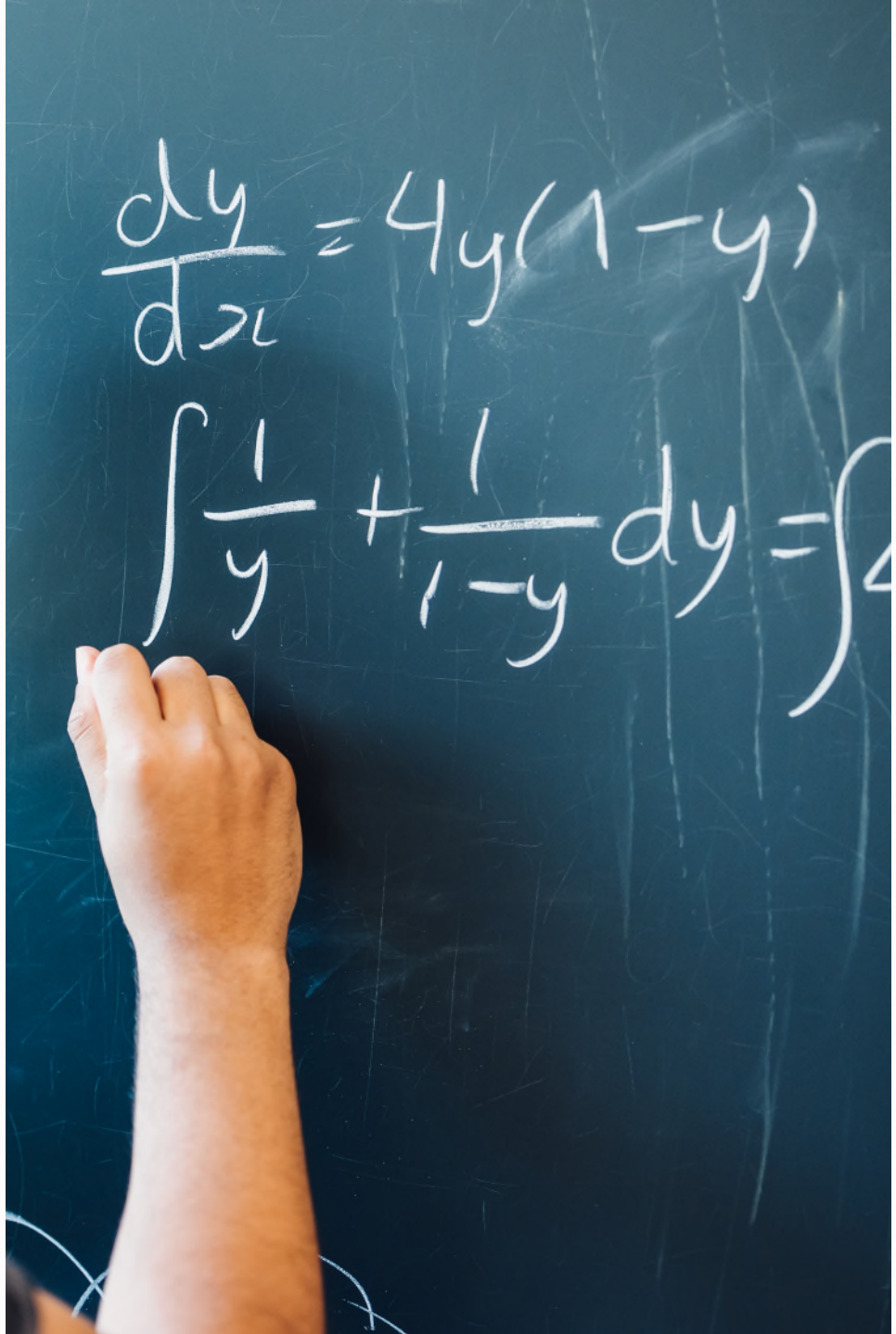
https://cls.ucl.ac.uk/wp-content/uploads/2017/02/The-importance-of-maths-CLS-policy-briefing.pdf; https://www.hesa.ac.uk/news/17-07-2025/sb272-higher-education-graduate-outcomes-statistics

What are we doing to address this?



What more can we do?

- Understand the barriers and challenges WP students may face in accessing maths support – from early access to entry to competitive courses
- Department and subject outreach has the power and ability to focus on primary outreach to target students early
- Target maths and related outreach on low SES areas and WP schools
- Develop and deliver programmes that strengthen math attainment and aptitude early and build on each other (e.g. primary through to secondary)



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Thank you for listening.

Questions?

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Suggested Reading and Bibliography

To learn more about how to support social mobility work at Warwick, visit our Widening Participation Staff Hub

- Equality of access and outcomes in higher education in England
- How do socioeconomic attainment gaps in early mathematical ability arise? (
- Why do early mathematics skills predict later mathematics and reading achievement? The role of executive function
- Policy briefing: The importance of maths – Evidence from the CLS cohort studies
- Predictors of mathematical attainment trajectories across the primary-to-secondary education transition: parental factors and the home environment
- Best start in life part 3: the 4 specific areas of learning
- The Cognitive and Numerical Predictors of Early Mathematical Achievement: A Latent Growth Curve Analysis
- Tracking mathematics achievement gaps in England: gender, socioeconomic status and ethnicity
- Global Gaps: Comparing socio-economic gaps in the performance of highly able UK pupils internationally
- Relationships between Family Socioeconomic Status and Mathematical Achievements in OECD and Non-OECD Countries
- Parents, not schools, hold the key to maths success
- How have intermediate outcomes changed over time?
- Graduate Outcomes 2022/23: Summary Statistics – Summary
- LEO Graduate and Postgraduate Outcomes
- State of the Nation: Entry to higher education