

Ethnic disproportionality in Special Educational Needs identification in England:

A multilevel analysis

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Partial results from a larger project

- Full report (Strand & Lindorff, 2018) covers:
 - Pupil-level cross-sectional results (2016 data)
 - Multilevel cross-sectional results (2016 data)
 - Longitudinal results, SEN identification over time (ending in 2015, Primary and Secondary cohorts)
 - LSYPE2 longitudinal results (matched to NPD data, nationally-representative sample)

Overview of this presentation

- Background: Ethnic disproportionality in SEN
- Aims and research questions
- Data & Methods
- Results
- Conclusions & implications
- Benefits and challenges of using the NPD for this project

Background: Disproportionality

- “Disproportionality”: pupils from an ethnic minority group are more (or less) likely to be identified with Special Educational Needs than pupils in the ethnic majority
- This has been a concern in the US and UK for decades (Dunn, 1968; Coard, 1971)
- Equity concerns: SEN identification could facilitate services *or* lead to social stigma & low expectations (Sheffield & Morgan, 2017) or narrowed curriculum
- Previous research in England showed evidence of disproportionality for SEN identification and that different types of need have different profiles in terms of disproportionality (Strand & Lindsay, 2009)

Here, we have an interest in accounting for school and LA levels

Background: Social, Emotional and Mental Health (SEMH)

- Pupils identified with SEMH “may experience a wide range of social and emotional difficulties which manifest themselves in many ways. These may include becoming withdrawn or isolated, as well as displaying challenging, disruptive or disturbing behaviour” (DfE, 2015)
- Most prevalent SEN type in the Secondary phase (2.4%), second most prevalent in Y1-11 (2.3%; DfE, 2016)
- High-judgment type of SEN
- Replaced Behavioural, Social and Emotional Disorders from 2015 after change to SEN Code of Practice in 2014

Background: Moderate Learning Difficulty (MLD)

- Identified when “children and young people learn at a slower pace than their peers, even with appropriate differentiation” (DfE, 2015)
- 3.5% prevalence overall (DfE, 2016), 4.0% in Y1-11 (compulsory school age)
- Approximately one fourth of pupils with SEN
- High-judgment type of SEN
- Most prevalent SEN type overall

Background: Autistic Spectrum Disorder (ASD)

- Pupils with ASD are “likely to have particular difficulties with social interaction. They may also experience difficulties with language, communication and imagination, which can impact on how they relate to others” (DfE, 2015)
- 1.3% prevalence, increasing over time (see Strand & Lindorff, 2018 or DfE, 2016)
- Relies on specialist assessment; more “medical” type of need
- Most prevalent SEN type amongst those with an Education, Health and Care plan (27.0% in Primary, 24.8% in Secondary; DfE, 2016)

Aims and research questions

- Which ethnic minority groups are over- or under-represented for SEMH, MLD and ASD, and to what extent?
 - To what extent is the above attributable to other student background characteristics (e.g. SES)?
- To what extent do the odds of SEN identification vary between schools and Local Authorities (LAs)?
- Which school characteristics are associated with SEMH identification?
 - Do school factors interact with pupil background?

Data

- National Pupil Database (NPD);
- Pupil data from the January 2016 School Census
- Primary: 3,666,196 pupils in 16,730 schools
- Secondary: 2,662,921 pupils in 3,353 schools
 - Pupil-level variables:
 - SEN identification (level and type)
 - Ethnic group (19 categories including White British)
 - Free School Meals entitlement (FSM)
 - Gender
 - Birth season (from birth month)
 - Year group
 - Neighbourhood deprivation (Index of Deprivation Affecting Children; IDACI), normalised

Data (cont.)

- Pupil records matched to School Level Census records
 - School variables:
 - Proportion ethnic minority groups of interest, chosen based on initial findings & coded in quintiles
 - Type (Foundation, Church, Grammar, Academy, Free, Community)
 - Size (number enrolled), coded in quintiles
 - Proportion eligible for FSM, coded in quintiles
- Listwise deletion for a small number of duplicate records (<0.05%) & records missing IDACI (<0.2%)
- Included only maintained mainstreamed schools, pupils on roll ≥ 10

Methods

- For initial analysis, multinomial logistic regression with SEN type as outcome
- For multilevel analysis, multilevel binary logistic regression with SEMH identification (1=yes, 0=no) as outcome
- Blocks of predictors entered hierarchically after running baseline 'empty' models (no predictors):
 - Pupil ethnic group
 - Additional pupil background
 - School variables
 - School X pupil interaction terms

Descriptive information: Ethnic groups

Ethnic group	Number (all age 5-16)	Percent
White British	4502558	69.4
White Other	367017	5.7
Pakistani	275269	4.2
Black African	235333	3.6
Indian	179111	2.8
Other Mixed	122534	1.9
Any Other	111023	1.7
Asian Other	110319	1.7
Bangladeshi	108478	1.7
Mixed White & Caribbean	96033	1.5
Black Caribbean	79909	1.2
Mixed White & Asian	78940	1.2
Unknown	60484	0.9
Black Other	46924	0.7
Mixed White & African	45042	0.7
Chinese	25993	0.4
Traveller Gypsy/Roma	21735	0.3
White Irish	19044	0.3
Traveller Irish	4869	0.1
Total	6490615	100

- Some groups make up very small proportions of the population
- Where we later group categories, e.g. Mixed White & Black Caribbean (MWBC) and Black Caribbean (BCRB), this is based on empirical findings
- Odds Ratios (ORs) in later results are in comparison to the White British majority

Descriptive information: SEN type by ethnic group

Ethnic Group	% SEMH	% MLD	% ASD
White British	3.0	4.1	1.4
White Irish	2.8	3.4	1.5
Traveller Irish	6.5	13.7	0.5
Traveller Gypsy/Roma	4.1	12.9	0.5
White Other	1.8	3.3	0.9
Mixed White & African	3.6	3.4	1.3
Mixed White & Caribbean	5.5	4.8	1.5
Mixed White & Asian	2.2	2.9	1.2
Mixed Other	3.2	3.2	1.5
Indian	0.8	2.5	0.7
Pakistani	1.5	5.6	0.8
Bangladeshi	1.4	3.6	1.1
Asian Other	1.0	2.6	0.9
Black African	2.5	3.5	1.6
Black Caribbean	6.3	5.2	1.7
Black Other	3.8	4.1	1.8
Chinese	0.7	1.4	1.4
Any Other	1.9	3.8	1.0
Unclassified/Refused	3.3	3.7	1.7
All pupils	2.8	4.0	1.3

Even with raw incidence rates for 2016, it is apparent that the percentage of pupils identified with each SEN type varies by ethnic group

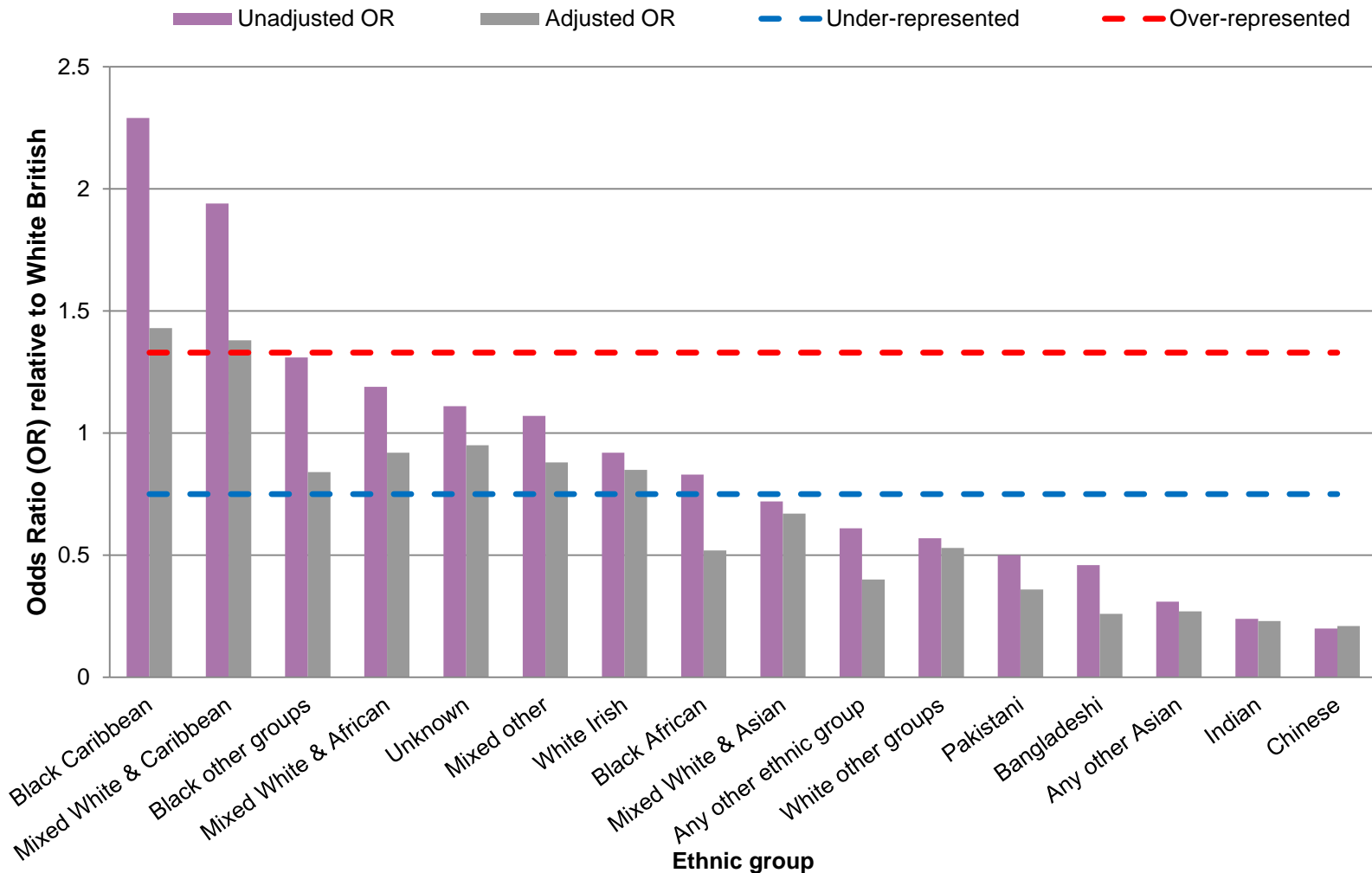
- E.g. rates are higher for BCRB & MWBC pupils for SEMH
- E.g. Rates are lower for Asian groups for all types (except Pakistani) for MLD

First look: Pupil disproportionality (Y1-11, age 5-16)

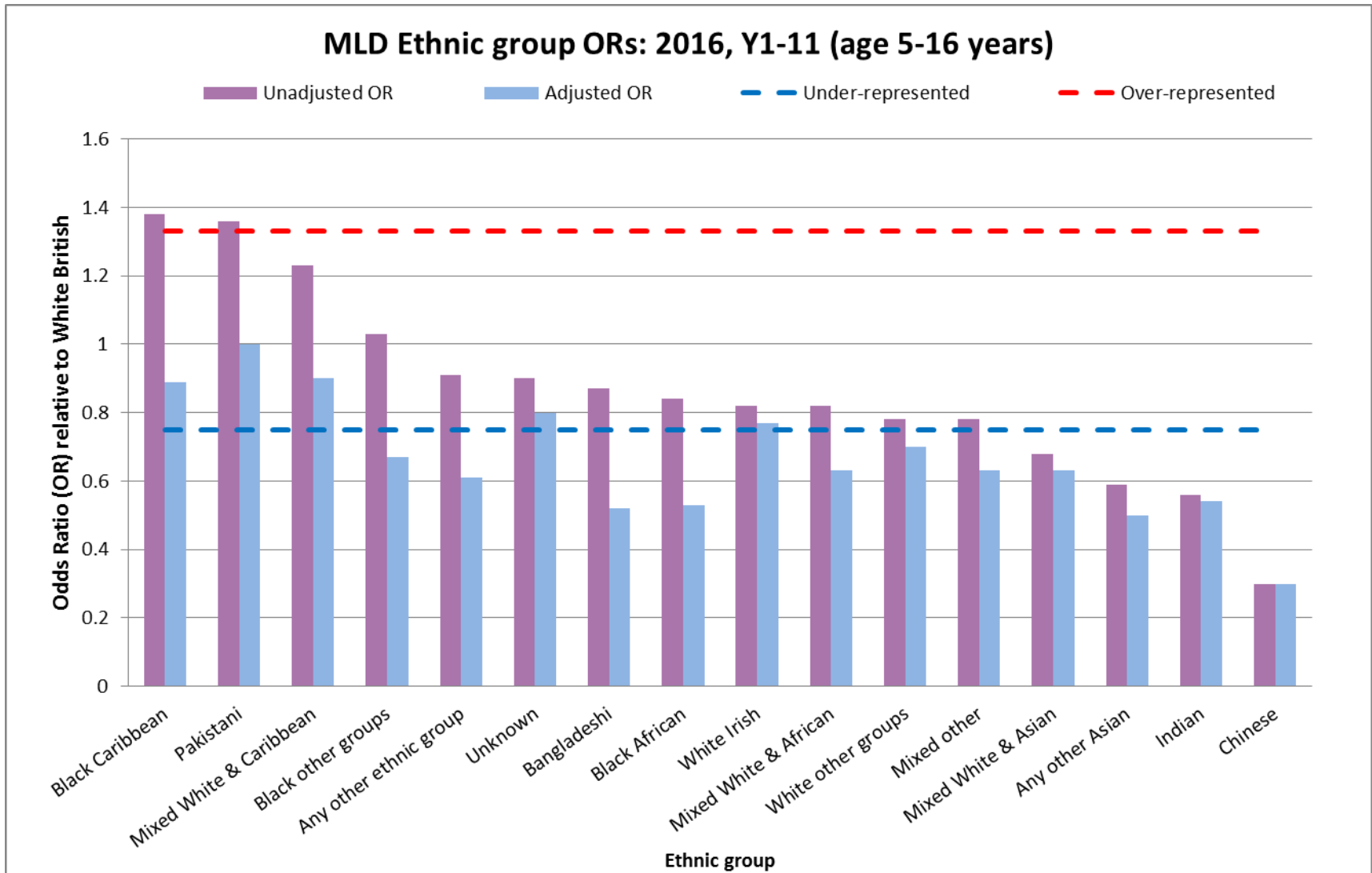
	SEMH			MLD			ASD		
	Raw	Adjusted		Raw	Adjusted		Raw	Adjusted	
<i>White Irish</i>	0.92	0.85 *		0.82 *	0.77 *		1.04	1.01	
<i>Traveller Irish</i>	2.87 *	1.53 *		4.35 *	2.45 *		0.44 *	0.31 *	
<i>Traveller Gypsy/Roma</i>	1.64 *	1.17 *		3.78 *	2.70 *		0.39 *	0.33 *	
<i>White other groups</i>	0.57 *	0.53 *		0.78 *	0.70 *		0.60 *	0.61 *	
<i>Mixed White & African</i>	1.19 *	0.92 *		0.82 *	0.63 *		0.94	0.86 *	
<i>Mixed White & Caribbean</i>	1.94 *	1.38 *		1.23 *	0.90 *		1.12 *	0.97	
<i>Mixed White & Asian</i>	0.72 *	0.67 *		0.68 *	0.63 *		0.84 *	0.81 *	
<i>Mixed other</i>	1.07 *	0.88 *		0.78 *	0.63 *		1.06 *	0.99	
<i>Indian</i>	0.24 *	0.23 *		0.56 *	0.54 *		0.46 *	0.47 *	
<i>Pakistani</i>	0.50 *	0.36 *		1.36 *	1.00		0.54 *	0.48 *	
<i>Bangladeshi</i>	0.46 *	0.26 *		0.87 *	0.52 *		0.79 *	0.65 *	
<i>Any other Asian</i>	0.31 *	0.27 *		0.59 *	0.50 *		0.63 *	0.60 *	
<i>Black African</i>	0.83 *	0.52 *		0.84 *	0.53 *		1.15 *	0.97	
<i>Black Caribbean</i>	2.29 *	1.43 *		1.38 *	0.89 *		1.34 *	1.12 *	
<i>Black other groups</i>	1.31 *	0.84 *		1.03	0.67 *		1.34 *	1.13 *	
<i>Chinese</i>	0.20 *	0.21 *		0.30 *	0.30 *		0.91	0.96	
<i>Any other ethnic group</i>	0.61 *	0.40 *		0.91 *	0.61 *		0.73 *	0.61 *	
<i>Unknown</i>	1.11 *	0.95 *		0.90 *	0.80 *		1.24 *	1.13 *	

Pupil-level disproportionality (SEMH)

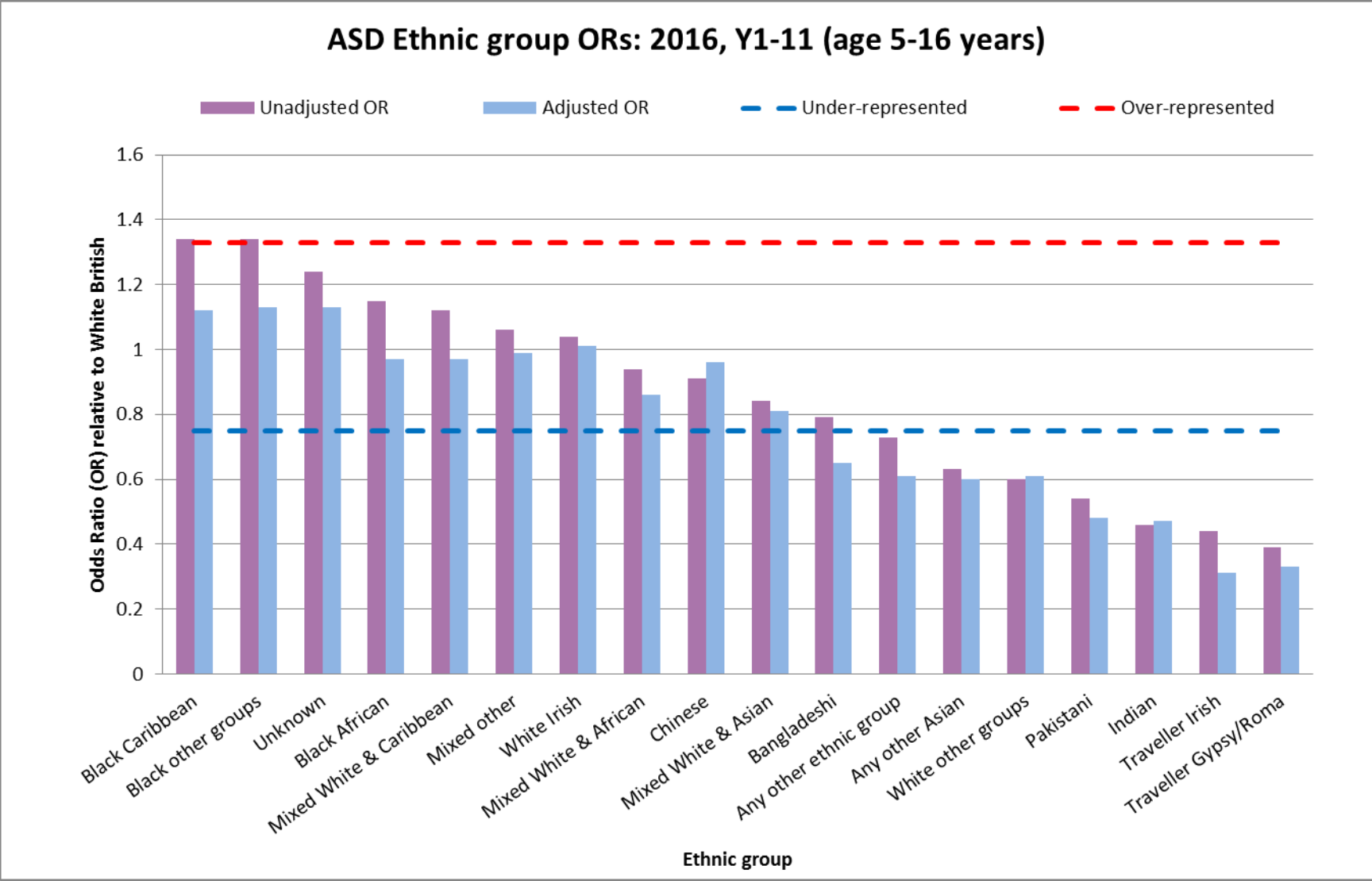
SEMH Ethnic group ORs: 2016, Y1-11 (5-16 years)



Pupil-level disproportionality (MLD)



Pupil-level disproportionality (ASD)



School and LA variation

- Variance Partition Coefficients (VPC) for empty models based on a latent variable approach; assumes the binary SEN type variable is dichotomised from a meaningful underlying distribution (Browne et al., 2005; Goldstein et al., 2002)
- For SEMH, 2-level models were a better fit, for MLD & ASD, 3-level

			LA VPC	School VPC
SEMH	Primary (Y1-6)	2-level	--	0.15
	Secondary (Y7-11)	2-level	--	0.18
MLD	Primary (Y1-6)	3-level	0.05	0.22
	Secondary (Y7-11)	3-level	0.06	0.26
ASD	Primary (Y1-6)	3-level	0.05	0.11
	Secondary (Y7-11)	3-level	0.04	0.12

Effect of accounting for clustering: SEMH

With identical predictors
(ethnic group & additional
student background):

SEMH	Primary		Secondary	
	1-level	2-level	1-level	2-level
White Irish	0.84 *	0.83 *	0.84 *	0.83 *
Traveller Irish	1.03	0.94	1.33 *	1.28
Traveller Gypsy	0.80 *	0.70 *	1.16 *	0.81 *
White Other	0.58 *	0.52 *	0.57 *	0.44 *
MWBA	0.98	0.93 *	1.02	0.91 *
MWBC	1.35 *	1.34 *	1.47 *	1.29 *
MWAS	0.69 *	0.67 *	0.80 *	0.72 *
Mixed Other	0.93 *	0.89 *	0.90 *	0.77 *
Indian	0.27 *	0.24 *	0.29 *	0.23 *
Pakistani	0.38 *	0.33 *	0.43 *	0.33 *
Bangladeshi	0.31 *	0.24 *	0.32 *	0.23 *
Asian Other	0.34 *	0.29 *	0.28 *	0.22 *
Black African	0.66 *	0.59 *	0.56 *	0.44 *
Black Caribbean	1.46 *	1.40 *	1.47 *	1.14 *
Black Other	0.91 *	0.84 *	0.91 *	0.75 *
Chinese	0.25 *	0.23 *	0.24 *	0.24 *
Any other	0.46 *	0.40 *	0.45 *	0.32 *
Unknown	0.93	0.90 *	0.92 *	0.89 *

- Robustness checks with different filtering
- Important to consider scaling in making comparisons

Effect of accounting for clustering: MLD

With identical predictors
(ethnic group & additional
student background):

- Robustness checks with different filtering
- Important to consider scaling in making comparisons

MLD	Primary		Secondary	
	1-level	3-level	1-level	3-level
White Irish	0.84 *	1.02	0.69 *	0.87 *
Traveller Irish	2.36 *	2.77 *	2.03 *	2.32 *
Traveller Gypsy	2.58 *	2.61 *	2.63 *	2.04 *
White Other	0.73 *	0.81 *	0.77 *	0.79 *
MWBA	0.68 *	0.74 *	0.60 *	0.69 *
MWBC	0.91 *	0.92 *	0.88 *	0.90 *
MWAS	0.67 *	0.67 *	0.67 *	0.69 *
Mixed Other	0.67 *	0.75 *	0.62 *	0.71 *
Indian	0.57 *	0.51 *	0.62 *	0.57 *
Pakistani	1.08 *	0.90 *	1.11 *	0.88 *
Bangladeshi	0.55 *	0.66 *	0.61 *	0.62 *
Asian Other	0.53 *	0.54 *	0.53 *	0.57 *
Black African	0.55 *	0.62 *	0.60 *	0.67 *
Black Caribbean	0.87 *	0.96	0.90 *	0.96
Black Other	0.72 *	0.80 *	0.66 *	0.73 *
Chinese	0.32 *	0.35 *	0.31 *	0.39 *
Any other	0.65 *	0.70 *	0.69 *	0.74 *
Unknown	0.84 *	0.94	0.74 *	0.87 *

Effect of accounting for clustering: ASD

With identical predictors
(ethnic group & additional
student background):

- Robustness checks with different filtering
- Important to consider scaling in making comparisons

ASD	Primary		Secondary	
	1-level	3-level	1-level	3-level
White Irish	1.09	0.98	1.03	0.96
Traveller Irish	0.26 *	0.25 *	0.22 *	0.21 *
Traveller Gypsy	0.25 *	0.24 *	0.14 *	0.13 *
White Other	0.74 *	0.66 *	0.47 *	0.45 *
MWBA	0.88	0.78 *	0.72 *	0.65 *
MWBC	1.03	0.89 *	0.98	0.85 *
MWAS	0.93	0.88 *	0.76 *	0.71 *
Mixed Other	1.06	0.93	0.90 *	0.82 *
Indian	0.62 *	0.61 *	0.27 *	0.27 *
Pakistani	0.52 *	0.54 *	0.30 *	0.28 *
Bangladeshi	0.87 *	0.75 *	0.32 *	0.30 *
Asian Other	0.71 *	0.64 *	0.31 *	0.27 *
Black African	1.18 *	0.97	0.49 *	0.43 *
Black Caribbean	1.15 *	0.90 *	0.86 *	0.70 *
Black Other	1.17 *	0.91	0.62 *	0.53 *
Chinese	1.18 *	1.03	0.60 *	0.56 *
Any other	0.75 *	0.65 *	0.36 *	0.34 *
Unknown	1.17 *	1.06	0.92	0.85 *

School composition/characteristics: SEMH

SEMHS		PRI	SEC
School type	Foundation	0.98	0.96
	Academy - Converter	0.90 *	0.91 *
	Academy - Sponsored	0.98	0.91 *
	Church	0.93 *	0.84 *
	Grammar	--	0.42 *
	Other (Free/CTC/UTC)	0.97	1.04
School FSM	Highest	1.54 *	1.56 *
	Average-High	1.49 *	1.37 *
	Average	1.32 *	1.32 *
	Low-Average	1.12 *	1.10 *
School ethnic group % (BCRB+MWBC)	Highest	1.07 *	1.28 *
	Average-High	1.07 *	1.19 *
	Average	1.06 *	1.19 *
	Low-Average	0.97	1.04
School size (roll)	Smallest	1.28 *	1.20 *
	Small-Average	1.13 *	0.97
	Average	1.02	1.02
	Average-Large	1.04	1.01
Variance/heterogeneity	School (residual) VPC	0.124	0.135

- Higher odds of identification:
 - high School %FSM
 - high School %BCRB/MWBC
 - to some extent, the smallest schools
- Lower odds of identification:
 - Grammar schools (in Secondary)
- School variables did little to improve model fit
- Ethnic group composition effect sensitive to filtering

School composition/characteristics: MLD

MLD		PRI		SEC	
School type	Foundation	1.08		1.07	
	Academy - Converter	0.91	*	0.92	
	Academy - Sponsored	0.85	*	0.91	
	Church	0.94	*	0.89	
	Grammar	--		0.05	
	Other (Free/CTC/UTC)	0.70	*	0.84	
School FSM	Highest	1.61	*	1.76	*
	Average-High	1.48	*	1.48	*
	Average	1.28	*	1.35	*
	Low-Average	1.16	*	1.12	
School ethnic group % (Asian excl. Pakistani)	Highest	0.99		0.82	*
	Average-High	0.98		0.80	*
	Average	0.97		0.89	
	Low-Average	1.01		0.93	
School size (roll)	Smallest	1.48	*	1.24	*
	Small-Average	1.17	*	1.12	*
	Average	1.12	*	1.12	*
	Average-Large	1.10	*	1.04	
Variance/heterogeneity	LA (residual) VPC	0.046		0.050	
	School (residual) VPC	0.210		0.197	

- Higher odds of identification:
 - high School %FSM
 - the smallest schools
- Lower odds of identification:
 - Grammar schools (in Secondary)
 - Other school types in Primary (very small proportion, <1% of all schools)
- School variables did little to improve model fit

School composition/characteristics: ASD

ASD		PRI	SEC
School type	Foundation	0.97	1.06
	Academy - Converter	0.93 *	0.97
	Academy - Sponsored	0.97	0.93
	Church	0.89 *	0.97
	Grammar	--	0.61 *
	Other (Free/CTC/UTC)	0.92	1.21 *
School FSM	Highest	1.17 *	0.96
	Average-High	1.25 *	1.02
	Average	1.23 *	1.11 *
	Low-Average	1.11 *	1.08 *
School ethnic group % (Indian, Pakistani, Bangladeshi, Asian Other)	Highest	1.01	1.08
	Average-High	1.11 *	1.11 *
	Average	1.05	1.02
	Low-Average	1.07 *	1.02
School size (roll)	Smallest	1.39 *	1.19 *
	Small-Average	1.08 *	1.12 *
	Average	1.11 *	1.05
	Average-Large	0.99	1.01
Variance/heterogeneity	LA (residual) VPC	0.050	0.039
	School (residual) VPC	0.106	0.097

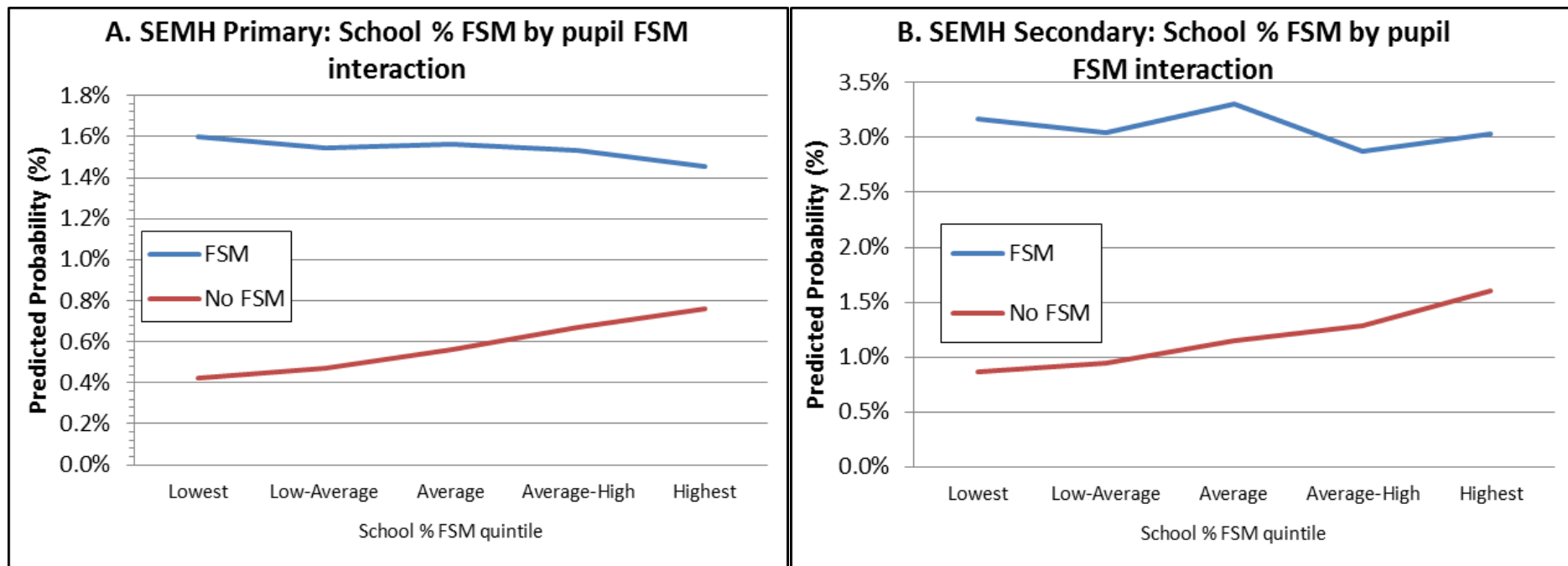
- Higher odds of identification:
 - Smallest schools
- Lower odds of identification:
 - Grammar schools (in Secondary)
- School variables did little to improve model fit
- Results robust to filtering

Cross-level interactions: SEMH

No school %BCRB/MWBC interaction with student BCRB/MWBC

School %FSM interaction with student FSM:

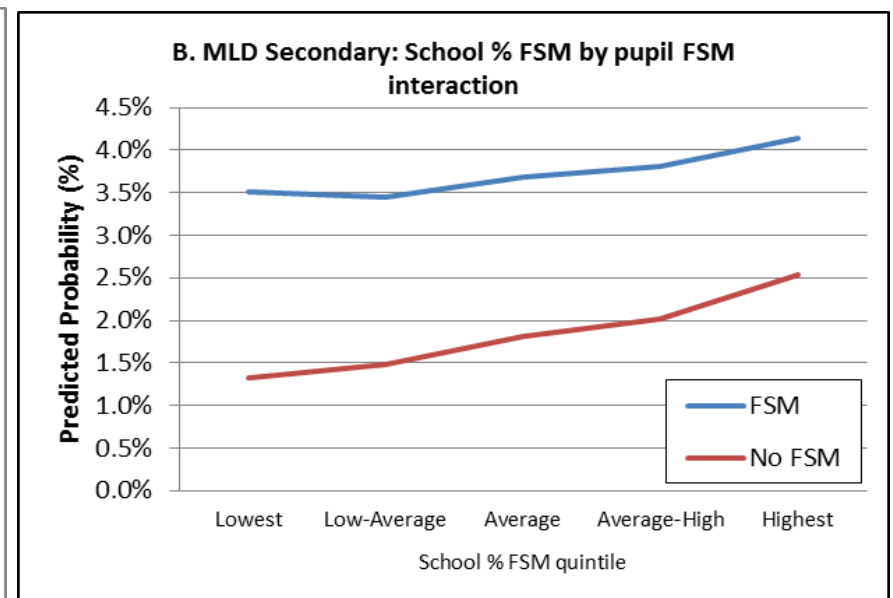
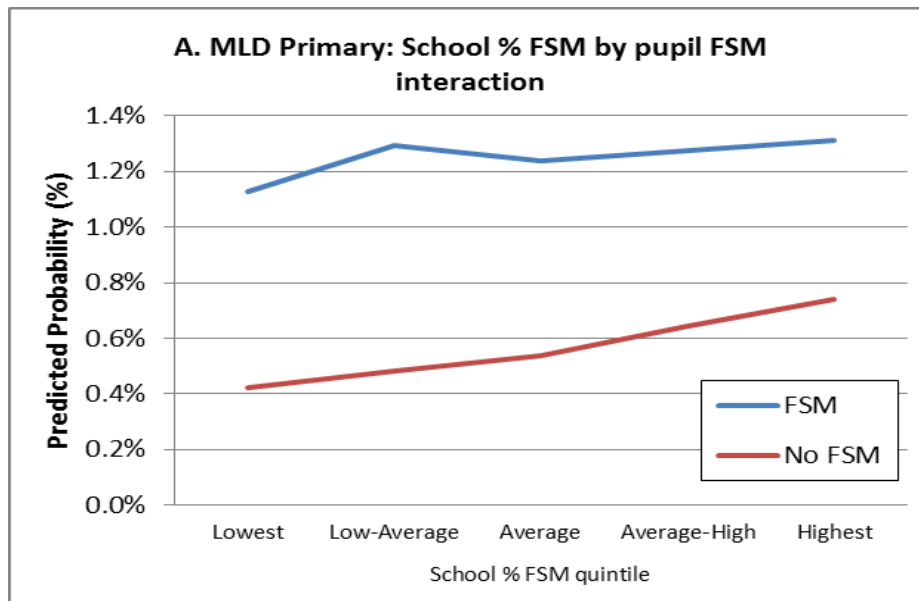
- For students with FSM, odds of identification consistent for different school %FSM
- For students without FSM, odds of identification higher when school %FSM is higher



Cross-level interactions: MLD

School %FSM interaction with student FSM. As for SEMH:

- For students with FSM, odds of identification fairly consistent for different school %FSM
- For students without FSM, odds of identification higher when school %FSM is higher



Summary conclusions

- There is variation in the likelihood of identification between schools, though the extent of this differs by SEN type, and fairly little variation between LAs (excluding special schools*)
- School characteristics including School % FSM, School % BCRB/MWBC and the smallest schools (esp. in Primary) are associated with higher odds of identification for SEMH
- School selectivity is associated with lower odds of identification in general
- Higher school deprivation (%FSM) => higher odds of identification, but mainly for pupils without FSM

Limitations

- Pupil and school variables and measurement (e.g. ethnic group categorisations) limited to those available in the NPD; there may be other explanations for observed disproportionality
- Quality of data – school reporting accuracy
- Interpretations about identification, no measure of actual incidence
- Large numbers of L1 and L2 units => limitations on model complexity possible, time-intensive
- Cross-sectional snapshot – but pupil-level time series data (ORs) largely indicate stability

Implications

For research:

- Further research could investigate school processes to find out what might be contributing to disproportionality

For school/LA/national policy:

- Importance of monitoring disproportionality in SEN identification at the school level
- Importance of considering disproportionality in SEND inspections (Ofsted)

Benefits and challenges of using the NPD...

Benefits:

- Possible to analyse pupil-level national population data
- Ability to track individuals over time
- Ability to match in achievement & school data

Challenges:

- Huge dataset – extremely long computation time and software limitations
- (In)consistencies over time (policy changes)
- Possible inconsistencies across schools (data quality)
- Unmeasured school processes

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Thank you!

Questions?

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