



Public Health  
England

Protecting and improving the nation's health

# **National Dental Epidemiology Programme**

Step-by-step sampling guide for  
primary school child cohort surveys

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## Background

The National Dental Epidemiology Programme follows guidance on sampling from the British Association for the Study of Community Dentistry (BASCD)<sup>1</sup>. This document translates this guidance into a step-by-step guide on undertaking sampling.

## Stage 1. Listing all schools

1. Contact the local authority and ask for information about numbers of children on the roll for each primary school, including academy primary schools, by age and class.
2. List all mainstream schools with numbers of children in reception year (becoming 5-years-old) plus year 1 (becoming 6-years-old). If you are choosing to finish the fieldwork before the February half term you only need to use the children in year 1 and do not need to calculate expected numbers of 5-year-olds.
3. Hide columns you do not need for this stage, this is better than deleting.

Below is an example of partial table showing numbers on roll.

Do not delete these columns – 'Hide' instead so they can be revealed later if needed

DfE Number	School Name	Ward	Reception Class	Year 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
3408	Holy Name RC Pr	Gorton North	10	11	59	57	51	38	51
3011	St Augustine's	Miles Platting	12	14	30	28	30	26	28
2333	Seymour Road Pr	Fallowfield	55	44	74	61	59	58	56
3418	St Ambrose RC P	Harpurhey	14	15	47	40	27	40	36
3452	St Malachy's RC	Chorlton Park	28	20	90	91	90	89	90
3504	St Anne's RC	Levenshulme	26	29	63	59	57	62	59
3482	St Richard's RC	Woodhouse Park	58	45	28	23	23	22	20
3415	St Aidan's C of E	Woodhouse Park	30	29	42	57	44	48	42
3469	St Wilfrid's RC	Bradford	27	23	28	23	23	27	21
3041	St Agnes CofE P	Higher Blackley	60	43	58	38	49	37	43
2234	Ravensbury	Miles Platting	49	45	36	28	31	43	37
...	.....	.....	...	...	...	...	...	...	...

<sup>1</sup> Pine CM, Pitts NB and Nugent ZN (1997). BASCD guidance on sampling for surveys of child dental health. A BASCD coordinated dental epidemiology programme quality standard. Community Dental Health 14 (Supplement 1); 10-17.

4. Divide total number of children in reception and year 1 by 2 to estimate the number of 5-year-olds. Round 0.5 to the nearest even number, for example  $20.5 = 20$ ,  $23.5 = 24$ .

DfE Number	School name	Reception Class	Year 1	Expected number of 5-year-olds (Reception + Year 1) $\div$ 2
3408	Holy Name RC Pr	10	11	$(10 + 11) \div 2 = 10$
3011	St Augustine's	12	14	$(12 + 14) \div 2 = 13$
2333	Seymour Road Pr	55	44	$(55 + 44) \div 2 = 50$
3418	St Ambrose RC P	14	15	$(14 + 15) \div 2 = 14$
3452	St Malachy's RC	28	20	$(28 + 20) \div 2 = 24$
3504	St Anne's RC	26	29	$(26 + 29) \div 2 = 28$
3482	St Richard's RC	58	45	$(58 + 45) \div 2 = 52$
3415	St Aidan's C of E	30	29	$(30 + 29) \div 2 = 30$
3469	St Wilfrid's RC	27	23	$(27 + 23) \div 2 = 25$
2301	Sandilands	51	46	$(51 + 46) \div 2 = 48$
3460	St Patrick's RC	13	9	$(13 + 9) \div 2 = 11$
3022	St Margaret's C	55	44	$(55 + 44) \div 2 = 50$
3041	St Agnes CofE P	60	43	$(60 + 43) \div 2 = 52$
2234	Ravensbury	49	45	$(49 + 45) \div 2 = 47$
2127	Haveley Hey Com	51	53	$(51 + 53) \div 2 = 52$
...	.....	...	...	and so on until completed

## Stage 2. Stratification by size of school

5. Sort the table in ascending order on the calculated 'Expected number of 5-year-olds' column.
6. Colour the rows in size bands to make it clearer

The BASCD guidance suggests the following school size groups:

- Small school = 1 to 15 5-year-olds
- Medium school = 16 to 49 5-year-olds
- Large school = 50+ 5-year-olds

Alternative school size groups:

- Small school = 1 to 29 5-year-olds
- Large school = 30+ 5-year-olds

DfE Number	School name	Reception Class	Year 1	Expected number of 5-year-olds
3408	Holy Name RC Pr	10	11	10
3460	St Patrick's RC	13	9	11
3011	St Augustine's	12	14	13
3418	St Ambrose RC P	14	15	14
3452	St Malachy's RC	28	20	24
3469	St Wilfrid's RC	27	23	25
3504	St Anne's RC	26	29	28
3415	St Aidan's C of E	30	29	30
2234	Ravensbury	49	45	47
2301	Sandilands	51	46	48
2333	Seymour Road Pr	55	44	50
3022	St Margaret's C	55	44	50
3041	St Agnes CofE P	60	43	52
3482	St Richard's RC	58	45	52
2127	Haveley Hey Com	51	53	52
5200	St Kentigern's	59	56	58
2000	Abbey Hey Prima	59	57	58
2216	Plymouth Grove	59	57	58
2048	Acacias Primary	59	58	58
2068	Claremont Prima	59	58	58
3028	St Mary's CofE	58	60	59
3507	The Divine Merc	58	60	59
2249	Irk Valley Comm	60	59	60
2305	Manley Park Pri	59	60	60
2324	Medlock Primary	60	59	60
2327	Crumpsall Lane	58	61	60
3040	Cheetham CofE C	61	58	60
3432	St Catherine's	60	59	60
3503	Mount Carmel RC	59	60	60
3424	St Anthony's RC	86	87	86
2017	Beaver Road Pri	91	89	90
2004	Chorlton Park P	90	92	91
2328	Birchfields Pri	94	92	93

7. Start to create the sampling frame table. Complete columns A and B.

School size	<b>A</b> Total number of schools	<b>B</b> Number of 5-year-olds attending school from expected calculation	<b>C</b> Proportion of 5-year-old population attending schools (rounded)	<b>D</b> Target number of children to randomly sample from each school size for main sample
Small (1-15)	4	10+11+13+14 = <b>48</b>		
Medium (16-49)	6	24+25+28+30+47+48 = <b>202</b>		
Large (50+)	23	50+.....+93 = <b>1,444</b>		
<b>Total</b>	<b>33</b>	<b>1,694</b>		

8. Calculate the proportion attending schools for each size group in column C. This allows calculation of the correct proportions of the main sample.

School size	<b>A</b> Total number of schools	<b>B</b> Number of 5-year-olds attending school from expected calculation	<b>C</b> Proportion of 5-year-old population attending schools (rounded)	<b>D</b> Target number of children to randomly sample from each school size for main sample
Small (1-15)	4	48	$(48 \div 1694) \times 100$ = 3%	
Medium (16-49)	6	202	$(202 \div 1694) \times 100$ = 12%	
Large (50+)	23	1,444	$(1444 \div 1694) \times 100$ = 85%	
<b>Total</b>	<b>33</b>	<b>1,694</b>		

The target minimum to be examined is 250 children per lower tier local authority. To allow for non-return of participation forms, absenteeism and inaccuracies in the numbers of children on roll it is wise to select a higher target sample size.

9. Refer to local previous survey response rates when selecting a target sample size. For example, a target sample size of 420 with a previous 60% response rate would give 252 children examined.

Caution should be used if previous response rates were less than 60% because if the response rate increases in the current survey you need to examine all children who have been sampled and for whom agreement to participate was received. You do not stop the survey when 250 children have been examined.

Previous low response rates should be viewed alongside how much effort was directed towards increasing the response rate. Was it low even though all methods to increase it were used and there was nothing more that could be done, or could more have been done?

10. Apply the proportions in column C to the target sample size you have decided to use for the main sample and calculate in column D how many children in each school size group need to be randomly sampled.

School size	<b>A</b> Total number of schools	<b>B</b> Number of 5-year-olds attending school from expected calculation	<b>C</b> Proportion of 5-year-old population attending schools (rounded)	<b>D</b> Target number of children to randomly sample from each school size for main sample
Small (1-15)	4	48	3%	$420 \times 3\% =$ $420 \times 0.03 = 13$
Medium (16-49)	6	202	12%	$420 \times 12\% =$ $420 \times 0.12 = 50$
Large (50+)	23	1,444	85%	$420 \times 85\% =$ $420 \times 0.85 = 357$
<b>Total</b>	<b>33</b>	<b>1,694</b>		<b>420</b>

## Stage 3. Sampling the schools

There should be a minimum of 20 different mainstream schools randomly sampled. If there are fewer than 20 mainstream schools in an area, then all the mainstream schools must be sampled.

The BASCD guidance suggests the following sampling intensities:

- small school (1–15) = sample all children who will be age eligible
- medium school (16-49) = sample 1 in 2 age eligible children
- large school (50+) = sample 1 in 4 age eligible children

Alternative sampling intensities:

- small school (1-29) = sample all children who will be age eligible
- large school (30+) = sample 1 in 2 age eligible children

11. Allocate every school a number, starting at 1 within each school size group.
12. Use a random number generator to sample schools in a random order. If it asks how many numbers you want generated, use the total number of schools in that size group, for example 23 for the large sized schools. Ask for no duplicates and they must be displayed in random order not sorted. Repeat for each school size group. This is an [example website](#) however others are available.

### Random Sequence Generator

This form allows you to generate randomized sequences of integers. The randomness comes from atmospheric noise, which for many purposes is better than the pseudo-random number algorithms typically used in computer programs.

#### Part 1: Sequence Boundaries

Smallest value  (limit -1,000,000,000)

Largest value  (limit +1,000,000,000)

Format in  column(s)

The length of the sequence (the largest minus the smallest value plus 1) can be no greater than 10,000.

#### Part 2: Go!

Be patient! It may take a little while to generate your sequence...

Note: A randomized sequence does not contain duplicates (the numbers are like raffle tickets drawn from a hat). There is also the [Integer Generator](#) which generates the numbers independently of each other (like rolls of a die) and where each number can occur more than once.

### Random Sequence Generator

Here is your sequence:

2  
16  
1  
11  
18  
12  
8  
23  
19  
17  
9  
5  
21  
14  
22  
15  
4  
13  
7  
20  
6  
10  
3

Timestamp: 2021-08-06 09:16:56 UTC



13. Record the order in which the schools were sampled. Repeat steps 12-13 for each size group.

DfE Number	School name	Reception class	Year 1	Expected number of 5-year-olds	Allocated number	Order of random selection
3408	Holy Name RC Pr	10	11	10	1	2
3460	St Patrick's RC	13	9	11	2	3
3011	St Augustine's	12	14	13	3	1
3418	St Ambrose RC P	14	15	14	4	4
3452	St Malachy's RC	28	20	24	1	6
3469	St Wilfrid's RC	27	23	25	2	3
3504	St Anne's RC	26	29	28	3	1
3415	St Aidan's C of E	30	29	30	4	4
2234	Ravensbury	49	45	47	5	2
2301	Sandilands	51	46	48	6	5
2333	Seymour Road Pr	55	44	50	1	3
3022	St Margaret's C	55	44	50	2	1
3041	St Agnes CofE P	60	43	52	3	23
3482	St Richard's RC	58	45	52	4	17
2127	Haveley Hey Com	51	53	52	5	12
5200	St Kentigern's	59	56	58	6	21
2000	Abbey Hey Prima	59	57	58	7	19
2216	Plymouth Grove	59	57	58	8	7
2048	Acacias Primary	59	58	58	9	11
2068	Claremont Prima	59	58	58	10	22
3028	St Mary's CofE	58	60	59	11	4
....	.....	...	...	...	and so on	and so on

14. Starting with the first school size group and the first randomly sampled school, calculate the number of children to be sampled from that school according to which sampling intensity is being used. Round 0.5 to the nearest even number, for example  $6.5 = 6$ ,  $7.5 = 8$ . Highlight the selected school.

DfE Number	School name	R	Yr 1	Expected number of 5-year-olds	Allocated number	Order of random selection	Target = 13 Intensity = all Number to be sampled
3408	Holy Name RC Pr	10	11	10	1	2	Spare 1
3460	St Patrick's RC	13	9	11	2	3	Spare 2
3011	St Augustine's	12	14	13	3	1	13
3418	St Ambrose RC P	14	15	14	4	4	
	<b>TOTAL</b>						<b>13</b>

15. If needed move to the next randomly sampled school in the same size group, calculate the number of children to be sampled from that school and highlight. Repeat this step until the total number of children sampled in the same school

size group is either equal to or greater than the target sample required for that size group.

16. Select the next 1 or 2 schools in the same school size group as 'spares' to use as a substitute if a school refuses or has closed or is in special measures.
17. Repeat steps 14 to 16 for each school size group.

DfE Number	School name	R	Yr 1	Expected number of 5-year-olds	Allocated number	Order of random selection	Target = 50 Intensity = 1 in 2 Number to be sampled
3452	St Malachy's RC	28	20	24	1	6	
3469	St Wilfrid's RC	27	23	25	2	3	$25 \div 2 = 12.5 = 12$
3504	St Anne's RC	26	29	28	3	1	$28 \div 2 = 14$
3415	St Aidan's C of E	30	29	30	4	4	Spare 1
2234	Ravensbury	49	45	47	5	2	$47 \div 2 = 23.5 = 24$
2301	Sandilands	51	46	48	6	5	Spare 2
	<b>TOTAL</b>						<b>50</b>

DfE Number	School name	R	Yr 1	Expected number of 5-year-olds	Allocated number	Order of random selection	Target = 357 Intensity = 1 in 4 Number to be sampled
2333	Seymour Road Pr	55	44	50	1	3	$50 \div 4 = 12.5 = 12$
3022	St Margaret's C	55	44	50	2	1	$50 \div 4 = 12.5 = 12$
3041	St Agnes CofE P	60	43	52	3	23	$52 \div 4 = 13$
3482	St Richard's RC	58	45	52	4	17	$52 \div 4 = 13$
2127	Haveley Hey Com	51	53	52	5	12	$52 \div 4 = 13$
5200	St Kentigern's	59	56	58	6	21	$58 \div 4 = 14.5 = 14$
2000	Abbey Hey Prima	59	57	58	7	19	$58 \div 4 = 14.5 = 14$
2216	Plymouth Grove	59	57	58	8	7	$58 \div 4 = 14.5 = 14$
2048	Acacias Primary	59	58	58	9	11	$58 \div 4 = 14.5 = 14$
2068	Claremont Prima	59	58	58	10	22	$58 \div 4 = 14.5 = 14$
3028	St Mary's CofE	58	60	59	11	4	$59 \div 4 = 14.8 = 15$
3507	The Divine Merc	58	60	59	12	6	$59 \div 4 = 14.8 = 15$
2249	Irk Valley Comm	60	59	60	13	18	$60 \div 4 = 15$
2305	Manley Park Pri	59	60	60	14	14	$60 \div 4 = 15$
2324	Medlock Primary	60	59	60	15	16	$60 \div 4 = 15$
2327	Crumpsall Lane	58	61	60	16	2	$60 \div 4 = 15$
3040	Cheetham CofE C	61	58	60	17	10	$60 \div 4 = 15$
3432	St Catherine's	60	59	60	18	5	$60 \div 4 = 15$
3503	Mount Carmel RC	59	60	60	19	9	$60 \div 4 = 15$
3424	St Anthony's RC	86	87	86	20	20	$86 \div 4 = 21.5 = 22$
2017	Beaver Road Pri	91	89	90	21	13	$90 \div 4 = 22.5 = 22$
2004	Chorlton Park P	90	92	91	22	15	$91 \div 4 = 22.8 = 23$
2328	Birchfields Pri	94	92	93	23	8	$93 \div 4 = 23.3 = 23$
	<b>TOTAL</b>						<b>358</b>

## 18. Complete columns E and F in the sampling frame table.

School size	A Total number schools	B Number of 5-year-olds attending school	C Proportion of 5-year-old population	D Target number of children to randomly sample for main sample	E Number of schools selected	F Number of children sampled
Small (1-15)	4	48	3%	13	1	13
Medium (16-49)	6	202	12%	50	3	50
Large (50+)	23	1,444	85%	357	23	358
<b>Total</b>	<b>33</b>	<b>1,694</b>		<b>420</b>	<b>27</b>	<b>421</b>

It may be necessary to adjust the sampling intensities and/or school size groups to achieve the minimum 20 different schools. If far too many schools are sampled and it is not feasible to visit that many, then the sampling intensities could be altered to reduce the number of sampled schools nearer to the required minimum (see below).

DfE Number	School name	R	Yr 1	Expected number of 5-year-olds	Allocated number	Order of random selection	Target = 357 Intensity = 1 in 3 Number to be sampled
2333	Seymour Road Pr	55	44	50	1	3	$50 \div 3 = 16.7 = 17$
3022	St Margaret's C	55	44	50	2	1	$50 \div 3 = 16.7 = 17$
3041	St Agnes CofE P	60	43	52	3	23	
3482	St Richard's RC	58	45	52	4	17	$52 \div 3 = 17.3 = 17$
2127	Haveley Hey Com	51	53	52	5	12	$52 \div 3 = 17.3 = 17$
5200	St Kentigern's	59	56	58	6	21	
2000	Abbey Hey Prima	59	57	58	7	19	Spare 2
2216	Plymouth Grove	59	57	58	8	7	$58 \div 3 = 19.3 = 19$
2048	Acacias Primary	59	58	58	9	11	$58 \div 3 = 19.3 = 19$
2068	Claremont Prima	59	58	58	10	22	
3028	St Mary's CofE	58	60	59	11	4	$59 \div 3 = 19.7 = 20$
3507	The Divine Merc	58	60	59	12	6	$59 \div 3 = 19.7 = 20$
2249	Irk Valley Comm	60	59	60	13	18	Spare 1
2305	Manley Park Pri	59	60	60	14	14	$60 \div 3 = 20$
2324	Medlock Primary	60	59	60	15	16	$60 \div 3 = 20$
2327	Crumpsall Lane	58	61	60	16	2	$60 \div 3 = 20$
3040	Cheetham CofE C	61	58	60	17	10	$60 \div 3 = 20$
3432	St Catherine's	60	59	60	18	5	$60 \div 3 = 20$
3503	Mount Carmel RC	59	60	60	19	9	$60 \div 3 = 20$
3424	St Anthony's RC	86	87	86	20	20	
2017	Beaver Road Pri	91	89	90	21	13	$90 \div 3 = 30$
2004	Chorlton Park P	90	92	91	22	15	$91 \div 3 = 30.3 = 30$
2328	Birchfields Pri	94	92	93	23	8	$93 \div 3 = 31$
	<b>TOTAL</b>						<b>357</b>

Revised sampling frame.

School size	<b>A</b> Total number schools	<b>B</b> Number of 5-year-olds attending school	<b>C</b> Proportion of 5-year-old population	<b>D</b> Target number of children to randomly sample for main sample	<b>E</b> Number of schools selected	<b>F</b> Number of children sampled
Small (1-15)	4	48	3%	13	1	13
Medium (16-49)	6	202	12%	50	3	50
Large (50+)	23	1,444	85%	357	17	357
<b>Total</b>	<b>33</b>	<b>1,694</b>		<b>420</b>	<b>21</b>	<b>420</b>

19. Send all the tables to your regional dental epidemiology coordinator (DEC) for checking and verification before commencing sampling the children.

## Stage 4. Sampling the children

Once the sampling tables have been checked and verified by the regional DEC, the schools can be contacted and children sampled.

20. Each sampled school should be contacted to ask if they will help with the survey and agree a date of examination.
21. If a school refuses, then a substitute can be used. Use substitute schools in the order in which they were randomly sampled. This is the reason for listing the order of selection for all schools and selecting some spares.
22. Obtain the reception and year 1 class lists from the schools.
23. Working from the class lists use the dates of birth to identify children who will have reached their fifth, but not their sixth birthday on the planned day of examination. In the protocol there is an appendix to help with this.
24. In small schools all age eligible children will be included and asked for agreement to participate.

25. In the medium and large sized schools use the agreed sampling intensities to select from the age-eligible children. Highlight all selected children and sampling can either be done by:
- allocating numbers to the children, then using the random number generator, as in step 12, select the school target number of children (for example 12) following the random order they were generated
  - for medium schools (using 1 in 2), include the first child on the list, then the third, fifth, seventh .....twenty-third child until you have the school target number. The next school you could start at the second child on the list, then select the fourth, sixth, and so on. For large schools (using 1 in 4) select the first child then the fifth, ninth, thirteenth .....forty-ninth child until you have the school target number
26. All sampled children should be asked for agreement to participate and a second request made for those who do not respond to the first. Every effort should be made to increase response rates in line with the guidance in the protocol.
27. All children with agreement to participate should be examined if they are present at school and are willing to cooperate.
28. Child substitution should not be used.
29. Children sampled in this way should be entered as '0 – Main sample'.

## Alternative sampling method for county councils

If an upper-tier local authority, with numerous lower-tier local authorities, would struggle to accommodate the minimum target of 250 children examined per lower-tier local authority due to a lack of resources available, then a sensible sampling method can be applied.

In step 9 when selecting a target sample size, the target could be set lower for each lower-tier local authority. For example if a minimum target of 150 children examined per lower-tier local authority is agreed locally as acceptable and achievable, with a previous 60% response rate, then the target sample size would be set at 250 children per lower-tier local authority rather than the example of 420 children in step 9.

Step 10 would then use the lower target sample size to calculate and complete column D of the sampling frame table.

The minimum number of schools to visit per lower tier local authority should be calculated based on the proportion of the lower target children to be examined compared with the standard target 250 children to be examined. For example:

- $(\text{lower target to be examined} \div \text{standard target to be examined}) \times 100 = \text{percentage}$
- $(150 \div 250) \times 100 = 60\%$
- $\text{percentage} \times \text{standard minimum different schools} = \text{lower minimum different schools}$
- $(60 \div 100) \times 20 = 12 \text{ different schools}$

Due to the smaller sample sizes for each lower-tier local authority, the results available will have larger confidence limits and there is less likely to be any results available at an even lower-level, but some results are better than no results.

## Intensive sampling

Some local authorities may require samples of sufficient size to produce robust information at a cluster level, ward level or for specific geographical areas. They may already work with commonly used clusters of wards for other information for example neighbourhoods or townships. There are ways of sampling and coding for this which avoid the need for 'census' surveys and should be discussed with the regional DEC.

### Across the whole local authority

If the local authority requires results split into different areas across the whole area, for example North, South, East and West then those areas can be treated as lower-tier local authorities, sampled individually using stages 1 to 4 and all the children can be input as 0 – Main sample. The data will be amalgamated together for the final local authority result in the main report and the specific area results will be analysed separately for the local tailored reports.

Likewise, if a local authority wants results for every ward, then every ward can be individually sampled and all the examined children can be input as 0 – Main sample. There must be an absolute minimum 15 children examined in each ward to produce estimates, so use previous response rates to calculate a target sample. For example, a target sample of 35 per ward with a previous 60% response rate would give 21 children examined. The target sample per ward will also depend on how many wards are within the local authority as you also need to remember you need a minimum 250 children examined for the main sample, so if there are fewer than 17 different wards then more than a minimum 15 children per ward need to be examined to reach the total minimum 250 children examined.

30. All children examined in the enlarged 'main sample' should be sent to the national Dental Public Health Team with an explanation of how it requires analysing. This ensures that the enlarged 'main sample' is analysed and included in the more detailed analysis for the local tailored reports in the way it was intended.

### Specific targeted areas

If the local authority wants greater detail for specific areas or wards which are of particular interest, for example an area with a targeted intervention programme, then an additional sample will need to be undertaken and the extra randomly sampled children will need to be input as such. These extra children will not be included in the main sample analysis for the main report but will be included in the lower level analysis for the local tailored reports.

31. Using the original main sample table created in steps 14 to 17, hide and unhide columns as required and add extra columns to code which ward cluster or specific area of interest the schools are situated in.

DfE Number	School name	Ward name	Cluster	Expected number of 5-year-olds	Order of random selection	Ratio	Number to be sampled
3408	Holy Name RC Pr	Gorton North	A	10	2	All	Spare 1
3460	St Patrick's RC	Gorton South	A	11	3	All	Spare 2
3011	St Augustine's	Miles Platting	A	13	1	All	13
3418	St Ambrose RC P	Harpurhey	A	14	4	All	
3452	St Malachy's RC	Chorlton Park	C	24	6	1:2	
3469	St Wilfrid's RC	Bradford	C	25	3	1:2	12
3504	St Anne's RC	Levenshulme	C	28	1	1:2	14
3415	St Aidan's C of E	Woodhouse Park	B	30	4	1:2	Spare 1
2234	Ravensbury	Miles Platting	A	47	2	1:2	24
2301	Sandilands	Hulme	C	48	5	1:2	Spare 2
2333	Seymour Road Pr	Fallowfield	D	50	3	1:4	12
3022	St Margaret's C	Didsbury East	D	50	1	1:4	12
3041	St Agnes CofE P	Higher Blackley	B	52	23	1:4	13
3482	St Richard's RC	Woodhouse Park	B	52	17	1:4	13
2127	Haveley Hey Com	Fallowfield	D	52	12	1:4	13
5200	St Kentigern's	Moss Side	B	58	21	1:4	14
2000	Abbey Hey Prima	Gorton North	A	58	19	1:4	14
....	.....	.....	...	...	...	...	...

32. Sort the table by cluster and/or ward and focus on the areas of interest. For this example, we are using cluster A, which contains Gorton North, Gorton South, Miles Platting and Harpurhey wards.
33. Total the number of children that have already been sampled in the area of interest. In this example 95 children have already been sampled from cluster A, so no further sampling is required. There needs to be an absolute minimum of 15 examined children in a sub-group for an estimate to be provided, so a target sample of 35 or more is adequate.



DfE Number	School name	Ward name	Cluster	Expected number of 5-year-olds	Order of random selection	Ratio	Number to be sampled
3408	Holy Name RC Pr	Gorton North	A	10	2	All	Spare 1
2000	Abbey Hey Prima	Gorton North	A	58	19	1:4	14
3460	St Patrick's RC	Gorton South	A	11	3	All	Spare 2
2324	Medlock Primary	Gorton South	A	60	16	1:4	15
3011	St Augustine's	Miles Platting	A	13	1	All	13
2234	Ravensbury	Miles Platting	A	47	2	1:2	24
3418	St Ambrose RC P	Harpurhey	A	14	4	All	
2216	Plymouth Grove	Harpurhey	A	58	7	1:4	14
3432	St Catherine's	Harpurhey	A	60	5	1:4	15
	<b>TOTAL</b>		<b>A</b>				<b>95</b>

If the interest was to look at results for each individual ward within the cluster, then in this example, if the target sample is 35 per ward, all wards except Miles Platting need a second phase of sampling.

DfE Number	School name	Ward name	Cluster	Expected number of 5-year-olds	Order of random selection	Ratio	Number to be sampled
3408	Holy Name RC Pr	Gorton North	A	10	2	All	Spare 1
2000	Abbey Hey Prima	Gorton North	A	58	19	1:4	14
	<b>TOTAL</b>	<b>Gorton North</b>					<b>14</b>

3460	St Patrick's RC	Gorton South	A	11	3	All	Spare 2
2324	Medlock Primary	Gorton South	A	60	16	1:4	15
	<b>TOTAL</b>	<b>Gorton South</b>					<b>15</b>

3011	St Augustine's	Miles Platting	A	13	1	All	13
2234	Ravensbury	Miles Platting	A	47	2	1:2	24
	<b>TOTAL</b>	<b>Miles Platting</b>					<b>37</b>

DfE Number	School name	Ward name	Cluster	Expected number of 5-year-olds	Order of random selection	Ratio	Number to be sampled
3418	St Ambrose RC P	Harpurhey	A	14	4	All	
2216	Plymouth Grove	Harpurhey	A	58	7	1:4	14
3432	St Catherine's	Harpurhey	A	60	5	1:4	15
	<b>TOTAL</b>	<b>Harpurhey</b>					<b>29</b>

34. More children at sampled schools should be randomly sampled where a 1 in 2, 1 in 3 or 1 in 4 sampling intensity was applied. The intensity can be increased to 'All' if 1 in 2 or 1 in 3 were sampled originally. Where 1 in 4 were originally sampled then 1 in 2 can be applied in the second phase. These 'additional sample' children must be coded 'Additional sample'.
35. If this still results in fewer than 35 children per group of interest sampled, then more schools should be randomly sampled in the order originally drawn. These 'additional sample' children will be coded 'Additional sample'.

School name	Ward name	...	Expected number of 5-year-olds	Order of random selection	Main Ratio	Main sample	Remaining number of 5-year-olds	Additional sample
Holy Name RC Pr	Gorton North	A	10	2	All	Spare 1	10	
Abbey Hey Prima	Gorton North	A	58	19	1:4	14	$58 - 14 = 44$	$44 \div 2 = 22$
<b>TOTAL</b>	<b>Gorton North</b>					<b>14</b>		<b>22</b>

St Patrick's RC	Gorton South	A	11	3	All	Spare 2		
Medlock Primary	Gorton South	A	60	16	1:4	15	$60 - 15 = 45$	$45 \div 2 = 22$
<b>TOTAL</b>	<b>Gorton South</b>					<b>15</b>		<b>22</b>

School name	Ward name	...	Expected number of 5-year-olds	Order of random selection	Main Ratio	Main sample	Remaining number of 5-year-olds	Additional sample
St Augustine's	Miles Platting	A	13	1	All	13		
Ravensbury	Miles Platting	A	47	2	1:2	24		
<b>TOTAL</b>	<b>Miles Platting</b>					<b>37</b>		<b>0</b>

St Ambrose RC P	Harpurhey	A	14	4	All			
Plymouth Grove	Harpurhey	A	58	7	1:4	14		
St Catherine's	Harpurhey	A	60	5	1:4	15	$60 - 15 = 45$	$45 \div 2 = 22$
<b>TOTAL</b>	<b>Harpurhey</b>					<b>29</b>		<b>22</b>

36. Additional children should be randomly selected using the method in step 25.
37. There may be some wards with very few primary schools, or even some with none. If there are fewer than 15 children in total within a ward of interest, then this information should be sent to the national Dental Public Health Team so it is clear why fewer than 15 children were examined when decisions are made regarding lower level results to publish.
38. All children examined in the 'main sample' and 'additional sample' should be sent to the national Dental Public Health Team with an explanation of the 'main sample' cluster and/or 'additional sample'. This ensures that the 'main sample' cluster and/or 'additional sample' are analysed and included in the more detailed analysis for the local tailored reports in the way it was intended.

If the regional DEC has undertaken the sampling on behalf of the fieldwork teams then make sure the tables provided for the fieldwork teams give them all the information they require:

- names of schools, with clarity if there are duplicate names in the area
- the estimated number of 5-year-olds at each school
- 'spare' schools in case of school refusal, with the order of approach shown for these
- the sampling intensity and target numbers for the 'main sample' for each school
- the instructions for additional children or additional schools for more intense samples with the intensities, target numbers and coding to apply

## Further information

For further information, please contact your regional DEC.

# About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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