National Dental Epidemiology Programme for England: Oral Health Survey of 5-year-olds 2021/22

A report on the variations in prevalence and severity of dental decay

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Executive summary

• Overall, 5-year-olds' decay experience (% d3mft>0) has remained stable since 2017, with about 4 in 10 (37.8%) children having dentinal decay experience.

Geographical differences:

- North of the city is worse affected, particularly for d3mft>0, incisor caries, mean no. dmft, and severe dmft, although not significantly.
- Wards with significantly higher decay burdens are North Evington (d3mft>0; 53%) and Wycliffe (mean no. dmft; 6.1 teeth).
- Lower IMD quintiles have less decay experience, especially in quintile 4 for d3mft>0, severe dmft, and enamel decay, where decay experience was significantly lower.

Ethnic differences:

- Asian ethnicity is associated with higher decay burden in d3mft>0, incisor caries, mean no. dmft, severe dmft, and enamel decay, although not significantly.
- Within ethnic groups, 'White Other' ethnicity shows higher decay experience than 'White British,' although not significantly.

Changes from 2019:

• Comparing to the 2019 survey, there is a significant decrease in 5-year-olds receiving dental fillings, likely influenced by the impact of COVID-19 on dental practice. Incisor caries increased since 2019, although not significantly.

1. Introduction to the Oral Health Survey of 5-year-olds

The Office for Health Improvement and Disparities (OHID; formerly PHE) National Dental Epidemiology Programme (NDEP) completes the examination of a random sample of 5-year-old children attending state-funded mainstream schools. The results presented here are from data collection during the 2021/22 academic year across local authorities in England. The survey routinely takes place every 2 years but was delayed from 2020 to 2021 by the COVID-19 pandemic. This is the sixth OHID NDEP oral health survey of 5-year-old children.

The aim of the survey is to measure the prevalence and severity of dental caries among 5-year-old children. The information is then used to:

- Inform the local oral health improvement strategy and health needs assessment, particularly joint strategic needs assessments.
- Provide comparisons with children of the same age in previous years (2012, 2015, 2017 and 2019).
- Identify oral health inequalities.

For the first time in this series of 5-year-old surveys, the prevalence of children with enamel decay is presented. This is an important threshold to highlight the proportion of children who are found to have early-stage decay who would ordinarily be considered among those being free of obvious decay.

1.1 Participation

132 out of 152 upper-tier local authorities took part in the survey. From the drawn national sample, 61% of children were examined; this response varied from 52% in Yorkshire and The Humber to 62% in the East Midlands. In Leicester, a total of 866 children from maintained schools across Leicester were examined, a participation rate of 73%, of the sample. This represents 17% of all 5-year-olds attending mainstream city schools. This is a lower proportion than in 2019, where 1076 five-year-old children were examined in Leicester, representing 23% of all 5-year-olds attending mainstream city schools. However, the 2021/22 sample size and participation rate is not dissimilar to earlier years, while 2018/19 was a particularly large sample. The 2021/22 sample is broadly representative of the Leicester 5-year-old population in terms of geography, ethnicity, and deprivation.

2. Local data

Local data was requested for Leicester to explore results by demographics, this is a total sample of 873 children. The data includes local geography (LSOA, MSOA, Ward), Deprivation, and Ethnicity information. The following indicators have been explored using the local data:

- 4.1 Decay experience
- **4.2** Average number of decayed teeth for children with decay experience (no. of dmft >0)
- 4.3 Enamel decay
- 4.4.Incisor caries
- 4.5 Visible plaque
- **4.6** Severe decay

Where possible, the 2021/22 findings for Leicester by each indicator are benchmarked against the previous 2019 survey findings for Leicester. Where numbers are below 15, data is suppressed. There are low numbers at LSOA and MSOA level, and for this reason geographic data is presented at larger geographies (broad area locality & Ward). The 2021/22 sample is broadly representative of the Leicester 5-year-old population in terms of geography, ethnicity, and deprivation.

3. National headlines

Overall, 23.7% of 5-year-old children in England had experience of dental decay. This is similar to 2019 findings where 23.4% of the surveyed children had experience of dental decay.

A 5-year-old child normally has 20 primary teeth. Among those who had experience of dental decay, the average number of teeth with dental decay was 3.5 (CI 3.50-3.59).

3.1 Variation by geography, ethnicity and deprivation

Children living in the most deprived areas of the country were almost 3 times as likely to have experience of dentinal decay (35.1%) as those living in the least deprived areas (13.5%).

It should be noted that factors such as ethnicity, exposure to water fluoridation and geographic location are also independently associated with decay levels in children, over and above that for deprivation.*

There was variation in prevalence of experience of dental decay by ethnic group and this was significantly higher in the 'Other Ethnic Groups' (44.8%) and the Asian/Asian British ethnic group (37.7%) than other ethnic groups.

23.7% of 5-yearolds with dental decay

4. Leicester decay experience (% d3mft>0)

- 37.8% of 5-year-old children in Leicester had one or more teeth that were decayed to dentinal level, extracted or filled because of caries (%d3mft>0), which is significantly higher than the national rate (23.7%).
- When compared to all 132 upper-tier local authorities that provided data, Leicester reports the 9th highest rate in 2022. Leicester was previously ranked 1st, 4th, 9th and 11th in 2012, 2015, 2017 and 2019, respectively.

The 10 Upper-Tier Local Authorities with highest burden of dental decay

Upper-Tier LA Name	d3mft>0 (%)
Brent	46.0
Liverpool	43.5
Bolton	42.8
Blackburn with Darwen	40.3
Rochdale	39.8
Oldham	39.5
Westminster	39.5
Herefordshire	38.7
Leicester	37.8
Luton	36.5
England	23.7

4.1 Decay experience (% d3mft>0)

- Amongst our comparators Leicester has one of the highest rates of having one or more teeth that were decayed to dentinal level, extracted or filled because of caries (d3mft>0).
- The fluoridation of water supplies in the West Midlands is a factor in the rates, with fluoridation offering protection to enamel.
- Nearly two-thirds (62.2%) of 5-year-old children in Leicester are free from tooth decay, which is significantly lower than the national average (76.3%) and many of our comparator authorities. This is a small decrease from 2019 (0.8 percentage points).

Percentage of 5 year olds with decay experience (d3mft>0), 2022



Note: Data not available for comparator Southampton because of non-participation.

4.1 Decay experience (% d3mft>0)

• Experience of dental decay amongst 5-year-olds remains similar to findings recorded in the previous surveys of 5-year-old children in 2017 and 2019, where 38.7% and 38.6%, of the surveyed children had experience of dental decay, respectively. There was great improvement between 2012 and 2017, however there has been little change since 2017. This is also observed at the national level, and amongst our comparators.





4.1 Change in decay experience (% d3mft>0)

Since 2012, Leicester has experienced the largest percentage decrease in decay experience compared to its child comparator authorities, with the proportion of decay experience decreasing from 53% in 2012 to 38% in 2022, equivalent to a 15.4% percentage point decrease.



Percentage change of 5 year olds with decay experience, 2012 to 2022

While there has been little change in decay experience in Leicester (0.8 percentage point decrease) and England (0.3 percentage point increase) since 2019, some of our comparators have experienced more change.



Percentage change of 5 year olds with decay experience, 2019 to 2022

4.1 Local data – decay experience (% d3mft>0)

Percentage (%) of 5-year olds with decay experience by broad area locality

- 5-year-old children from the north of the city had a higher proportion of decay experience (46%), while those in the east of the city had the lowest (28%).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), experienced lower decay experience compared to those of higher deprivation (quintiles 1-3).

100% 90% 80% % dmft>0 70% 2022 60% 50% 40% % dmft>0 45.9% 30% 42.6% 41.2% 36.4% 32.1% 37.7% 2019 20% 10% 0% Leicester North North Central West South East 2022: 38.0% West Broad area locality

Percentage (%) of 5-year olds with decay experience by IMD



being the 10% least deprived, of areas nationally).

4.1 Local data – decay experience (% d3mft>0)

- 5-year-old children of 'Asian' ethnicity had the highest proportion of decay experience (44%). The decay experience amongst Asian children has slightly increased since 2019 (40%).
- Those of 'Black' ethnicity had the lowest proportion with • decay experience compared to any other ethnic group (26%).
- Within ethnic group analysis revealed that those of 'White British' had a lower proportion of decay experience (29%) when compared to those of 'White Other' ethnicity (38%), although this was not significant.



Percentage (%) of 5-year olds with decay experience

Notes: 'Other' ethnicity omitted due to small numbers.

4.1 Map - decay experience (% d3mft>0)

- The percentage of decay experience was highest in the north and north east of the city centre, with significantly higher prevalence in North Evington (52.5%).
- Lower prevalence was found in the south and east of the city, with significantly lower prevalence in Knighton (8.3%) and Humberstone and Hamilton (22%).



- 4.2 Average number of decayed teeth for children with decay experience (no. of dmft >0)
 - Among the children with decay experience, the average (mean) number of decayed, missing or filled teeth (due to decay) in England was 3.5. The East Midlands average was also 3.5. The average for Leicester was 4.1, significantly worse than the national and regional average, and many of our comparators.

Mean number of decayed, missing and filled teeth of 5 year olds with decay experience, 2022



4.2 Average number of decayed teeth for children with decay experience (no. of dmft >0)

• The mean number of decayed, missing and filled teeth, among children with decay experience, remains similar to findings recorded in previous surveys of 5-year-olds spanning over the past decade, with there being little change in this indicator since 2012.

Average number of decayed, missing and filled teeth of 5 year olds with decay experience, 2012-2022



4.2 Average number of decayed teeth for children with decay experience (mean no. of d3mft>0)

- 5-year-old children from the north of the city had a higher mean number of decayed, missing and filled teeth (4.6), while those in the east of the city had on average a lower mean number of decayed, missing and filled teeth (3.1).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), had a lower mean number of decayed, missing and filled teeth compared to those of higher deprivation (quintiles 1-2)*.

Mean number of decayed, missing and filled teeth, of those with decay (no. of dmft >0), by broad area locality



Mean number of decayed, missing and filled teeth, of those with decay (no. of dmft >0), by IMD



Note: IMD quintile 5 omitted due to small numbers. 4.2 Average number of decayed teeth for children with decay experience (mean no. of d3mft>0)

- 5-year-old children of 'Black' ethnicity had a higher mean number of decayed, missing and filled teeth (4.6), followed by those of 'Asian' ethnicity (4.3).
- Within ethnic group analysis revealed that those of 'White British' had a lower proportion of decay experience (3.5) when compared to those of 'White Other' ethnicity (4.7), although this was not significant.

Mean number of decayed, missing and filled teeth, of those with decay (no. of dmft >0), by broad ethnic group



4.2 Map - Average number of decayed teeth for children with decay experience (mean no. of d3mft>0)

- Across the city, among those with decay experience, an average of about 4-5 affected teeth was most common across the city.
- 5-year- old children in Wycliffe had a significantly higher average number of teeth affected (6.4 teeth).
- Wards with a significantly lower number of affected teeth include Humberstone & Hamilton (1.9 teeth), Knighton (2.3 teeth), Braunstone Park & Rowley Fields (3.1 teeth)*.
- *The difference in % dmft and mean no. d3mft in Braunstone Park & Rowley Fields is likely due to a higher number of children in this ward having only one recorded decayed tooth. Unlike other wards, Braunstone Park & Rowley Fields lacked severe dmft cases, keeping the overall average lower.



4.3 Enamel decay and/or any dental caries

- The prevalence of enamel decay is being reported for the first time in this series. Identifying those with enamel decay is important as with preventative measures, it may help halt the progression of enamel decay to dentinal decay, preventing the need for invasive dentistry to restore loss of tooth structure in the future.
- In England, the rate of enamel decay was 29.3%. In Leicester, it was 46.8%, which is significantly higher.

DfE comparator authorities

Percentage with enamel and any caries (dmft>0), 2022



4.3 Enamel decay and/or any dental caries

- 5-year-old children from the north and west of the city had a higher proportion of enamel decay (52% and 51%, respectively), while those in the east and south of the city had the lowest (38% and 37%, respectively).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), experienced a lower proportion of enamel decay compared to those of higher deprivation (quintiles 1-3).

Notes:

- No comparison to 2019 survey; enamel decay is being reported for the first time in this series
- IMD quintile 5 omitted due to small numbers



70% 2022 60% 50% 40% 30% 51.3% 49.2% 20% 40.3% Leicester 30.0% 2022: 10% 47.1% 0% 2 3 IMD deprivation decile (1 being the 10% most deprived and 5 being the 10% least deprived, of areas nationally).

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4.3 Enamel decay and/or any dental caries

- 5-year-old children of 'Asian' ethnicity had the highest proportion of enamel decay (52%). Those of Black and White ethnicity (43% and 40%, respectively) had the lowest.
- Within ethnic group analysis revealed that those of 'White British' had a lower proportion of enamel decay and/or dental caries (39%) when compared to those of 'White Other' ethnicity (46%), although this was not significant.



Notes:

- No comparison to 2019 survey; enamel decay is being reported for the first time in this series
- 'Other' ethnicity omitted due to small numbers

Percentage (%) of enamel decay, by broad ethnic

4.3 Map - Enamel decay and/or any dental caries

- Prevalence of enamel decay and/or any dental caries was highest in the north, north east and north west of the city centre, with the highest prevalence across Wycliffe (59%), North Evington (59%), Stoneygate (58%), and Belgrave (58%), although this was not significant.
- Lower prevalence was found in the south of the city, with significantly lower prevalence in Knighton (16.7%).



4.4 Children with incisor caries

- It is useful to know what proportion of children had dental decay affecting one or more of their incisor (front) teeth. This type of decay is usually associated with long term bottle use with sugar-sweetened drinks, especially when these are given overnight or for long periods during the day. Overall, the national prevalence of incisor decay was 6.6%; a slight increase from 5.5% in 2019. The south west (5.0%) had the lowest prevalence and London had the highest prevalence (8.6%).
- Within some local authorities there is likely to be marked geographic variation as this type of decay is closely linked with specific health behaviours which are influenced by local cultural norms. Children with incisor decay are likely to have more teeth affected than is the case for general decay, so tackling this problem may lead to relatively higher benefits. In Leicester, 12.8% of children had dental decay affecting one or more of their incisor teeth, this is significantly more than the national rate and many of our comparators. It is also an increase from 2019 (11.4%).

Percentage of children with incisor caries, 2022



23

4.4 Children with incisor caries

The percentage of children with incisor caries remains similar to findings recorded in previous surveys of 5-year- olds*, with a modest • increase between 2017 and 2022.



Percentage of children with incisor caries, 2017-2022

*No trend data for 2012 survey; incisor caries was not reported until 2017

4.4 Local data – incisor caries

- 5-year-old children from the north of the city had a higher proportion of incisor caries (20%), while those in the east and south of the city had the lowest (11% and 5%, respectively).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), experienced a lower proportion of incisor caries compared to those of higher deprivation (quintiles 1-3).



Note: IMD quintile 5 omitted due to small numbers

4.4 Local data – incisor caries

 5-year-old children of 'Asian' ethnicity had the highest proportion of incisor caries (17%). Those of Black and Mixed ethnicity had the lowest proportion of enamel decay (8% and 6%, respectively). Within ethnic group analysis revealed that those of 'White British' had a lower proportion of incisor caries (8%) when compared to those of 'White Other' ethnicity (12%), although this was not significant.



Percentage (%) with incisor caries, by broad ethnicity

4.5 Children who have substantial plaque

- The presence of substantial amounts of plaque compared with 'visible' or no plaque provides a proxy measure of children who do not brush their teeth, or brush them rarely. Such children cannot benefit from the protective effects of fluoride in toothpaste.
- Substantial plaque was recorded for 3.0% of children in England. A similar rate was recorded in Leicester, with 3.6% of children. This is an increase from 2019 where substantial plaque was around 1% both in England and locally.



Sandwell

Walsall

Birmingham

Wolverhampton

F 0.3

F 0.3

F 0.0

+ F 0.0



4.6 Local data – visible plaque

- 5-year-old children from the centre and west of the city had a higher proportion of visible plaque (35% and 34%, respectively), while those in the north of the city had the lowest (19%).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), experienced a lower proportion of enamel decay compared to those of higher deprivation (quintiles 1-3).



South

North

West

North

Leicester

2022:

28.1%

Broad area locality

East

Central

West



Notes:

No published LA- level data on this indicator; only local data available. IMD quintile 5 omitted due to small numbers

Percentage (%) with visible plaque, by broad area locality

4.6 Local data – visible plaque

 5-year-old children of 'Mixed' ethnicity had the highest proportion of visible plaque (29%). Those of Black and unknown ethnicity had the lowest proportion of severe decay (28% and 19%, respectively). Within ethnic group analysis revealed that those of 'White British' had a lower proportion of visible plaque (26%) when compared to those of 'White Other' ethnicity (44%), although this was not significant.



Percentage (%) with visible plaque, by broad ethnic group

Broad ethnic group

Notes:

No published LA- level data on this indicator; only local data available. 'Other' ethnicity omitted due to small numbers

4.7 Local data – severe decay

- 5-year-old children from the north of the city had a higher proportion of severe decay (25%), while those in the south and the east of the city had the lowest (10% and 7%, respectively).
- 5-year-old children of lower deprivation (quintile 4), as per the Index of Multiple Deprivation (IMD), experienced a lower proportion of severe decay compared to those of higher deprivation (quintiles 1-3).

Notes:

No published LA- level data on this indicator; only local data available. IMD quintile 5 omitted due to small numbers

Percentage (%) with severe dental decay, by broad area locality







4.7 Local data – severe decay

5-year-old children of 'Asian' ethnicity had the highest proportion of severe decay (20%). Those of White and Mixed ethnicity had the lowest proportion of severe decay (13% and 12%, respectively). Within ethnic group analysis revealed that those of 'White British' had a lower proportion of severe decay (11%) when compared to those of 'White Other' ethnicity (20%), although this was not significant.



Percentage (%) with severe dental decay, by broad

Broad ethnic group

Notes:

No published LA- level data on this indicator; only local data available. 'Other' ethnicity omitted due to small numbers

4.8 Care Index

The Care Index gives an indication of the restorative activity of ٠ dentists in each area. It is the percentage of teeth with decay experience that have been treated by filling (ft/d3mft). The proportion of decayed teeth that were filled was 7.4% across England as a whole. This varied regionally from 3.8% in the north west to 12.9% in London.

Percentage of teeth with decay experience that have been filled (ft/d3mft), 2022



DfE comparators

Notes:

No local data on this indicator; only published LA- level data on this indicator available.

4.8 Care Index

• In Leicester, the proportion of decayed teeth that were filled in 2022 was 3.2%, a low proportion considering the rate of decay in the city. There was great improvement between 2012 and 2017 but the proportion of filled teeth has significantly fallen since 2017, to lower levels than when the survey was first conceived in 2012. This may be related to access to dentists during the pandemic.



5. Ward table

Significantly higher than Leicester

Significantly lower than Leicester

Ward Name	Children Surveyed	% Decay experience	Average decayed teeth	% Enamel	% Incisor caries	% Severe decay	% Plaque visible
Abbey	41	41.5%	4.6	53.7%	17.1%	22.0%	26.8%
Aylestone	38	44.7%	3.2	44.7%	13.2%	10.5%	23.7%
Beaumont Leys	52	32.7%	3.8	44.2%	15.4%	17.3%	13.5%
Belgrave	26	53.8%	4.9	57.7%	34.6%	26.9%	23.1%
Braunstone Park & Rowley Fields	48	50.0%	3.1	56.3%	14.6%	18.8%	35.4%
Castle	28	21.4%	4.8	32.1%	10.7%	10.7%	46.4%
Evington	34	29.4%	3.8	38.2%	2.9%	11.8%	32.4%
Eyres Monsell	33	36.4%	2.9	42.4%	6.1%	6.1%	27.3%
Fosse	42	42.9%	4.6	54.8%	7.1%	21.4%	33.3%
Humberstone & Hamilton	41	22.0%	1.9	34.1%	0.0%	2.4%	22.0%
Knighton	36	8.3%	2.3	16.7%	0.0%	0.0%	33.3%
North Evington	80	52.5%	4.1	58.8%	25.0%	25.0%	36.3%
Rushey Mead	27	40.7%	4.6	44.4%	14.8%	22.2%	14.8%
Saffron	59	32.2%	4.0	39.0%	3.4%	15.3%	22.0%
Spinney Hills	61	41.0%	4.7	55.7%	16.4%	23.0%	31.1%
Stoneygate	50	48.0%	3.5	58.0%	14.0%	14.0%	32.0%
Thurncourt	29	34.5%	4.1	48.3%	17.2%	10.3%	27.6%
Troon	44	34.1%	4.5	38.6%	6.8%	20.5%	9.1%
Westcotes	31	45.2%	5.6	54.8%	22.6%	29.0%	48.4%
Western	51	29.4%	3.5	43.1%	9.8%	9.8%	25.5%
Wycliffe	22	45.5%	6.4	59.1%	18.2%	27.3%	27.3%
Leicester	873	38.0%		47.1%	12.8%	16.6%	28.1%

6. Local data sample

Row Labels	Grand Total	%
A1 - British	191	21.9%
A2 - Irish	/	/
A4 - White other	50	5.7%
B1 - White Black Caribbean	/	/
B2 - White Black African	/	/
B3 - White Asian	15	1.7%
B4 - Mixed other C1 - Indian	36 278	4.1% 31.8%
C2 - Pakistani	25	2.9%
C3 - Bangladeshi	24	2.7%
C4 - Chinese		/
C5 - Asian other	49	5.6%
D1 - Black African	/	/
D2 - Black Caribbean	/	/
D3 - Black other	44	5.0%
E1 - Arab	/	/
E2 - Any other	/	/
X - Ethnic group not provided	99	11.3%
Grand Total	873	100.0%

Row Labels	Grand Total	%
1	366	41.9%
2	316	36.2%
3	119	13.6%
4	60	6.9%
5		
Grand Total	873	100.0%

Row Labels	Grand Total	%
Central	185	21.2%
East	115	13.2%
North	157	18.0%
North West	121	13.9%
South	151	17.3%
West	144	16.5%
Grand Total	873	100.0%

Row Labels	Grand Total	%
- White	244	27.9%
3 - Mixed	75	8.6%
C - Asian / Asian British	380	43.5%
) - Black / Black British	61	7.0%
- Other Ethnic Group	14	1.6%
 Ethnic group not provided 	99	11.3%
Grand Total	873	100.0%

Note: Demographics with counts of <15 have been suppressed

7. Further information

- 1. National data and reporting is available here: <u>National Dental Epidemiology Programme (NDEP) for</u> England: oral health survey of 5 year old children 2022 - GOV.UK (www.gov.uk)
- 2. Local information and oral health guidance is available here: <u>https://www.leicester.gov.uk/health-and-social-care/public-health/get-oral-health-advice/healthy-teeth-happy-smiles/</u>
- 3. The latest oral health needs assessment (2023) for Leicester City is available here: <u>Oral health</u> (leicester.gov.uk)

