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Betsi Cadwaladr University Health Board

Dental caries in 5 year olds 2007/08 and 2011/12

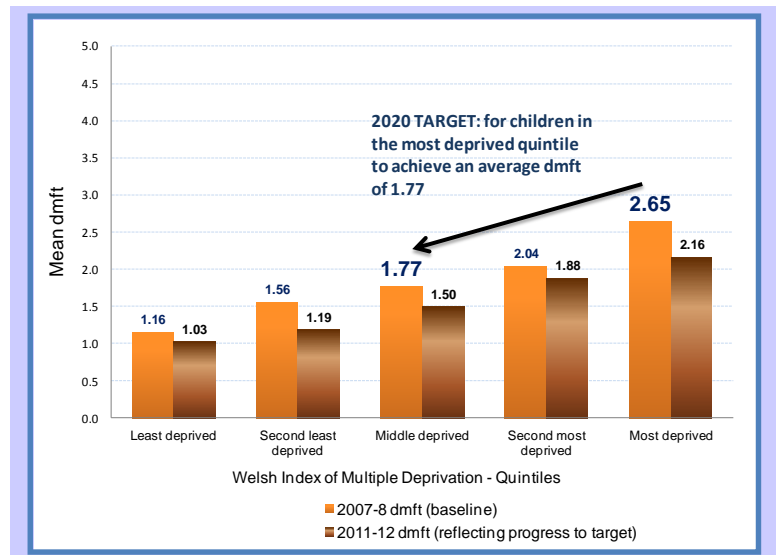
The 2013 Oral Health Profile for Betsi Cadwaladr University Health Board presents oral health data for school year 1 (approximately 5 years of age) generated from a survey undertaken during the winter of 2011/12 and compares it with the previous survey carried out in 2007/08. This profile focuses on local health board (LHB), unitary authority (UA) and upper super output area (USOA) analyses. For Wales's level data see the "Picture of Oral Health" at the Welsh Oral Health Information Unit (WOHIU) website.

This is the first comparison of data collected via formal written parental consent, as two sets of data are now available incorporating this approach. Before 2007/08 child oral health surveys used passive consent; this methodological change prohibited analysis of trends as data was no longer comparable.

Figure 1 Average dmft¹ for 5 year olds in 2007/08 and 2011/12 in Wales, by quintiles of the Welsh Index of Multiple Deprivation

Key messages

- ◆ Preventable and active decay levels fell in Betsi Cadwaladr 5 year olds
- ◆ Health board 2011/12 decay levels were lower than the Welsh averages
- ◆ Flintshire saw improvements in child oral health & has lower experience of decay when compared with Wales
- ◆ Health board inequalities in oral health appear to be reducing



Progress towards National oral health target

One goal of national oral health policy is to reduce inequalities experienced in children's oral health. Progress towards this goal is assessed by monitoring trends recorded by child oral health surveys. There are Wales's level targets for 5 and 12 year olds. For 5 year olds, the aim is to improve the average dmft and the percentage with caries, for the most deprived fifth as at 2007/08 to match the

¹ The average number of decayed, missing and filled teeth (dmft) is a measure of the decay experience in children. It is therefore the burden of disease which theoretically could have been prevented and thus key data for evaluation of efforts to prevent decay.

caries levels experienced by the middle fifth in 2007/08, by 2020. For the most deprived fifth of 5 year old children in Wales, the average dmft was 2.65 in 2007/08. The national child poverty target for 2020 is to bring this average down to 1.77. In 2011/12 the average dmft for the most deprived fifth was 2.16; half a tooth reduction when compared with 2007/08 and good progress towards the 2020 target (Figure 1).

The results of the Wales 2011/12 survey of 5 year olds suggest that prevalence of dental caries is improving but this needs to be confirmed by reviewing the results of future surveys, the next being scheduled for 2015/16.

These targets are **Welsh targets**; to date there are **no** Health Board targets. But, this oral health profile does give an indication of changes to oral health within Betsi Cadwaladr.

Local Health Boards (LHBs)

PREVENTABLE DECAY

The sum of decayed, missing and filled teeth is a measure of the decay experience of the average child. It is the burden of disease which theoretically could have been prevented.

Average dmft scores for Welsh local health boards in 2007/08 and 2011/12 are presented in Figure 2. Abertawe Bro Morgannwg, Hywel Dda and Betsi Cadwaladr experienced statistically significant reductions. In Betsi Cadwaladr the averages were 1.6 (95%CI² 1.5-1.8) and 1.4 (95%CI: 1.3-1.5). Betsi Cadwaladr averages were statistically lower than Welsh averages for both surveys.

Figure 2 Average dmft for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12

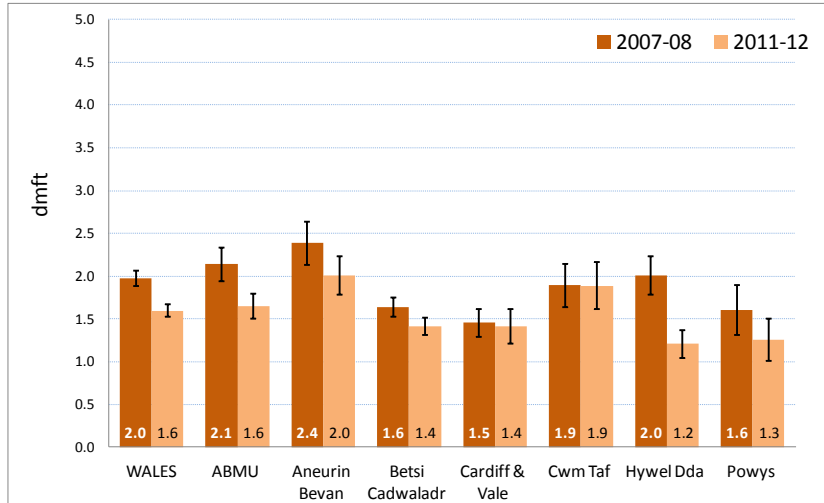
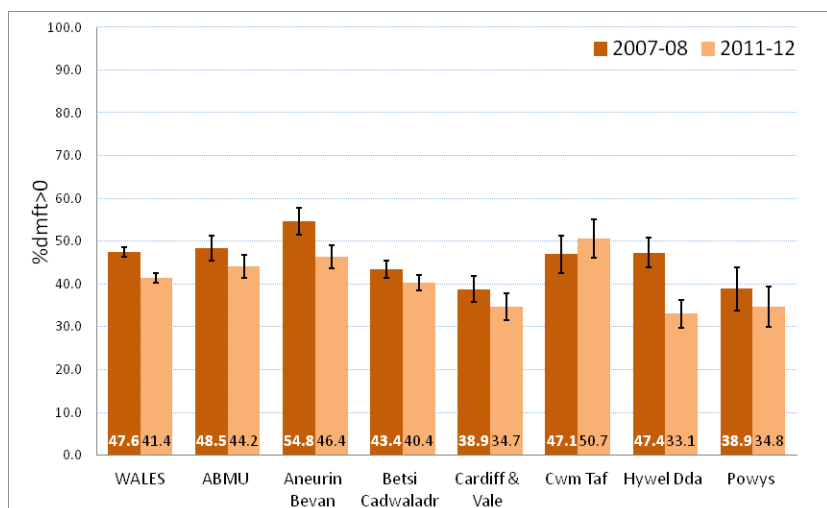


Figure 3 illustrates the proportion of children with at least one decayed tooth (%dmft>0) by LHB in 2007/08 and 2011/12. Although there appears to be a general tendency (except in Cwm Taf) for a reduction in the proportion of children with decay experience, the changes only reach statistical significance in Aneurin Bevan and Hywel Dda local health board areas.

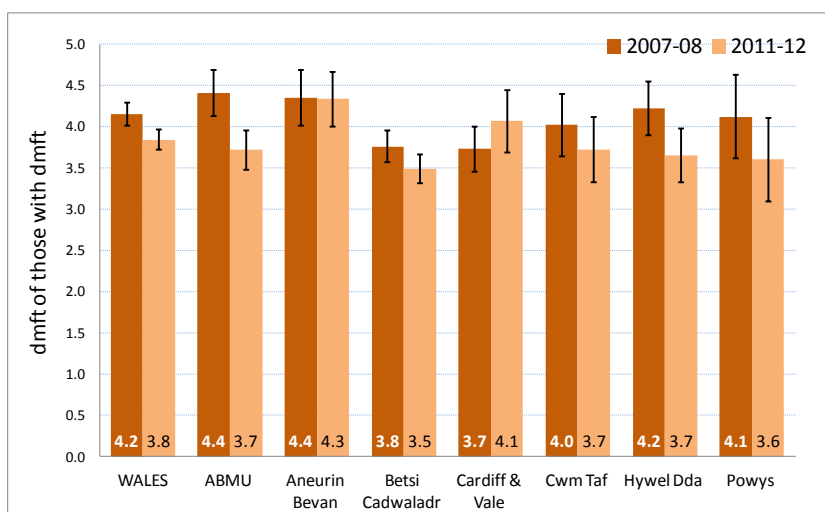
² 95%CI represents the 95% lower and upper confidence intervals. A confidence interval constitutes a range of values for a variable of interest, e.g. mean dmft, constructed so that this range has a specified probability of including the true value of the variable. So a 95% confidence interval has a 95% probability of including the true value.

Figure 3 Percentage of 5 year olds with caries experience (%dmft>0), Welsh local health boards, 2007/08 compared with 2011/12



The %dmft>0 for Betsi Cadwaladr in 2011/12 was 40.4% (95%CI: 38.5%-42.3%) which was within average range when compared with the Welsh average of 41.4% (95%CI: 40.3%-42.5%).

Figure 4 Average dmft of those with caries experience for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12



The average number of decayed, missing and filled teeth among the children with at least one decayed/missing/filled tooth is shown in Figure 4. There is a general tendency for a reduction in the mean scores; the only change shown which reaches statistical significance is in ABMU where the averages for 2007/08 and 2011/12 were 4.4 (95%CI: 4.1-4.7) and 3.7 (95%CI: 3.5-4.0) respectively.

ACTIVE DECAY

The decayed teeth (dt) component of total experience of decay (dmft) measures active decay. This puts the child at risk of pain, infection and suggests risk of decay of permanent successor teeth. In the past it has been called untreated disease.

The concept of treating all decay in deciduous teeth by providing fillings or extractions is being questioned and researched. Children with decay need to reduce the consumption of sugar in their diets, carry out supervised toothbrushing with fluoride toothpaste and have regular application of fluoride varnish by dental professionals, as opposed to operative dental procedures. Thus dt data is now regarded as a marker for children/families who need support in managing this chronic dental disease.

Only Betsi Cadwaladr and Hywel Dda showed statistically significant reductions in average dt scores between 2007/08 and 2011/12 (Figure 5). In 2011/12 average dt ranged from 0.8 in Hywel Dda to 1.5 in Aneurin Bevan. The average dt for Betsi Cadwaladr for the same survey year was 0.9 (95%CI: 0.8-1.0) which was statistically lower when compared with the Welsh average of 1.1 (95%CI: 1.0-1.1).

Figure 5 Average dt for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12

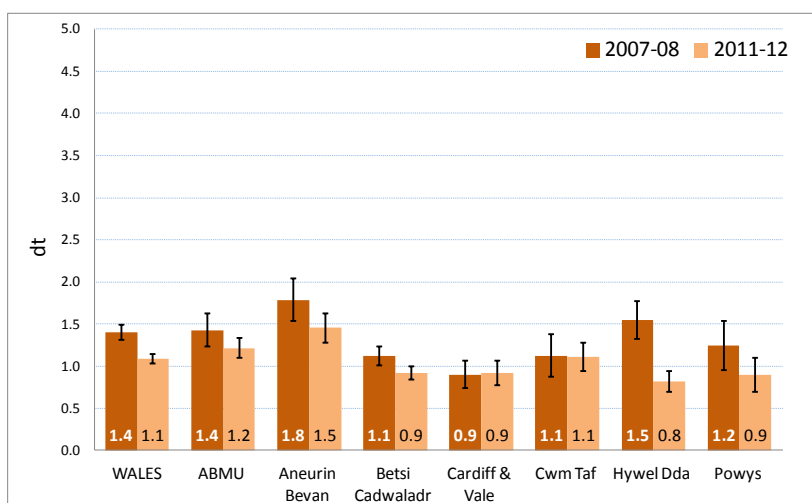
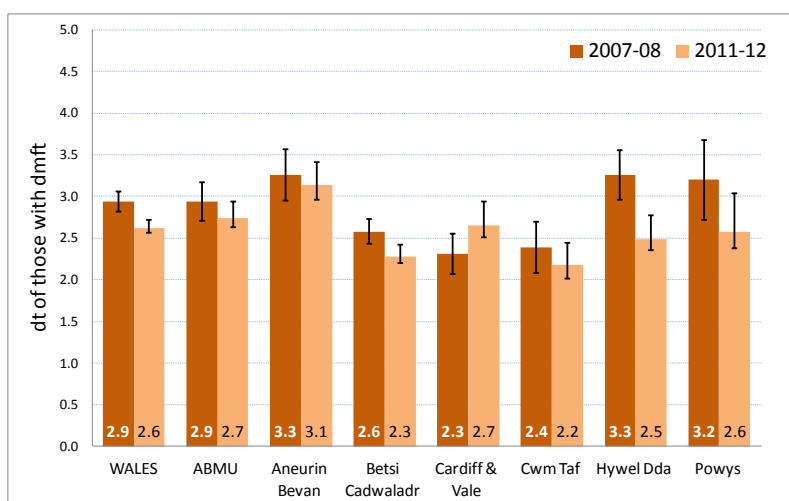


Figure 6 shows the changes in average dt for those children with decay experience between the 2 survey years by health board. Only Hywel Dda and Betsi Cadwaladr experienced statistically significant reductions. In 2011/12 the averages ranged from 2.2 in Cwm Taf to 3.1 in Aneurin Bevan. For the same year in Betsi Cadwaladr the dt of those with caries was 2.3 (95%CI: 2.1-2.4) which was statistically lower than the Welsh average, 2.6 (95%CI: 2.5-2.7).

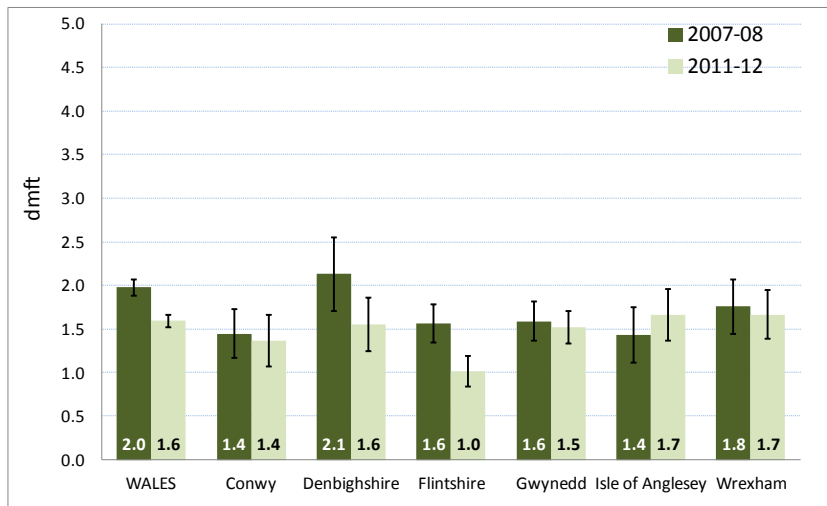
Figure 6 Average dt of those with any experience of caries (dmft) for 5 year olds, Welsh local health boards, 2007/08 compared with 2011/12



Unitary Authorities (UAs)

PREVENTABLE DECAY

Figure 7 Average dmft for 5 year olds, in unitary authorities within Betsi Cadwaladr University Health Board, 2007/08 compared with 2011/12



Between 2007/08 and 2011/12 there was a statistically significant reduction in average dmft for Wales, the values were 2.0 (95%CI: 1.9-2.1) and 1.6 (95%CI: 1.5-1.7) respectively.

Flintshire experienced a significant reduction in average dmft between 2007/08 (1.6, 95%CI 1.3-1.8) and 2011/12 (1.0, 95%CI 0.8-1.2). Flintshire's dmft for both surveys were statistically significantly lower than the Welsh averages for the same year (Figure 7).

Whilst Denbighshire experienced a notable reduction in average dmft across the two surveys, from 2.1 to 1.6, this was not statistically significant.

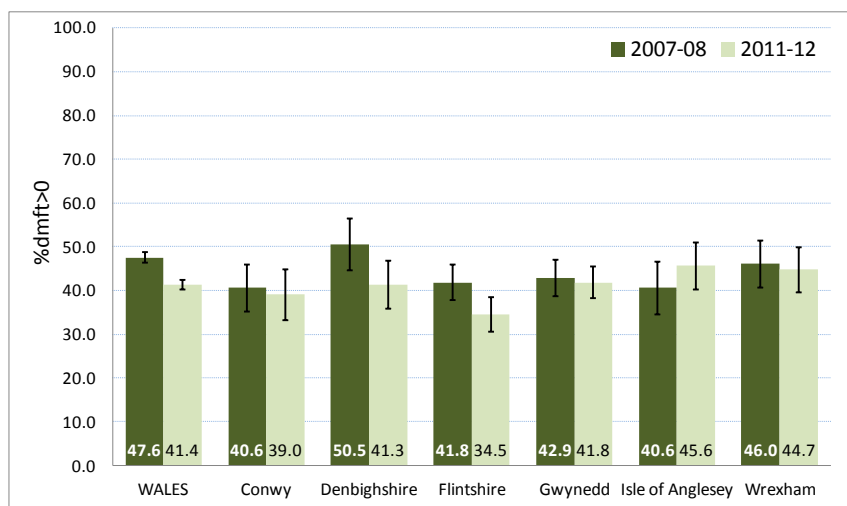
The average dmft for 5 year olds living in Conwy, Gwynedd and Wrexham plateaued between 2007/08 and 2011/12. For example the Conwy averages were 1.4 for both surveys. The 2011/12 averages for all three unitary authorities were within the Welsh average range for the same survey.

Anglesey experienced a small increase in average dmft from 1.4 to 1.7 between 2007/08 and 2011/12 but this was not a statistically significant change. The 2011/12 average for the unitary authority was within the average range for Wales as a whole for the same survey.

For Wales there was a significant reduction in the proportion of 5 year olds with decay (%dmft>0) between 2007/08 and 2011/12, the values were 47.6% (95%CI: 46.4%-48.7%) and 41.4% (95%CI: 40.3%-42.5%) respectively. It is encouraging that more children have no obvious decay experience by age 5 (Figure 8).

For the unitary authorities within Betsi Cadwaladr University health board there were reductions in the %dmft>0 for Denbighshire and Flintshire between the two surveys; but these reductions were not statistically significant. However, the dmft>0 for Flintshire at each time point was statistically significantly lower than the contemporaneous Welsh percentage (Figure 8).

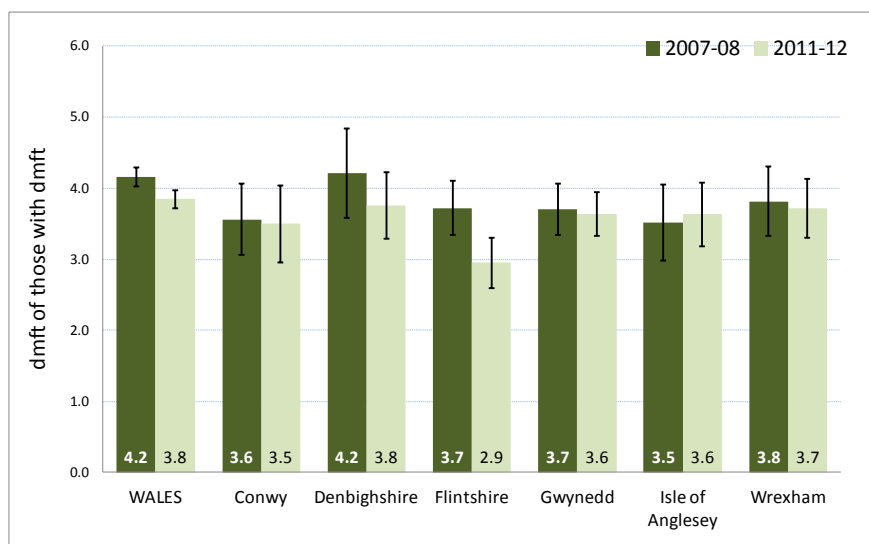
Figure 8 Percentage of 5 year olds with caries experience (%dmft>0) in unitary authorities within Betsi Cadwaladr University Health Board, 2007/08 compared with 2011/12



Conwy, Gwynedd and Wrexham experienced little change in the %dmft>0 between 2007/08 and 2011/12. The %dmft>0 for all three unitary authorities during 2011/12 were all within the average range for Wales for the same survey.

Anglesey experienced a small increase in the proportion of 5 year olds with decay from 40.6% in 2007/08 (95%CI 34.6-46.6%) to 45.6% in 2011/12 (95%CI 40.2-51.1%) but this change was not statistically significant.

Figure 9 Average dmft of those with caries experience for 5 year olds, in unitary authorities within Betsi Cadwaladr University Health Board, 2007/08 compared with 2011/12



Looking only at those children who have at least one decayed, missing or filled tooth illustrates the stark differences between children with decay and those without. The average dmft for a child with dmft is shown in Figure 9. For Wales overall, the reduction from 4.2 in 2007/08 (95%CI 4.0-4.3) to 3.8 in 2011/12 (95%CI 3.7-4.0) does suggest an improving position.

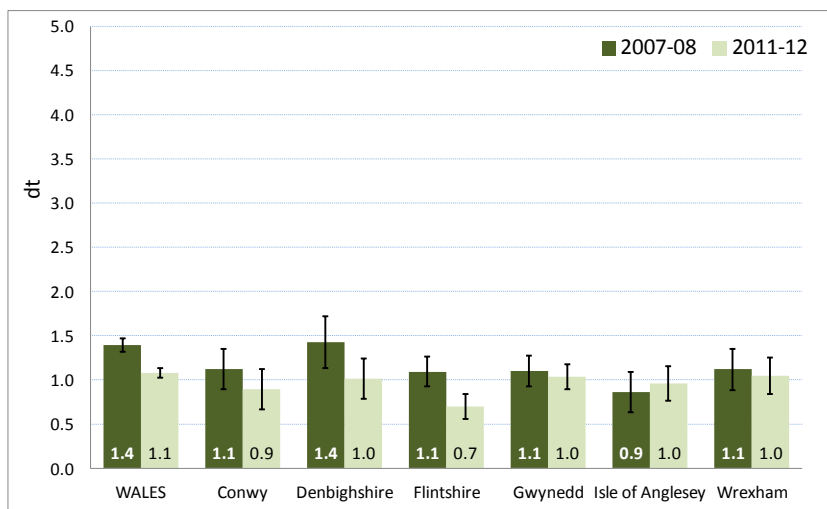
The unitary authority experience for the average dmft of those with caries followed a similar trend as the other preventable decay indicators. Both Denbighshire and Flintshire experienced reductions in

this characteristic between 2007/08 and 2011/12. Whilst the reduction for the former unitary authority was not statistically significant the reduction for Flintshire was (2007/08 3.7 [95%CI 3.4-4.1]; 2011/12 2.9 [95%CI 2.6-3.3]). The dmft of those with caries experience for Flintshire in 2011/12 was statistically lower than the Welsh average for the same survey (Figure 9).

Conwy, Gwynedd, Wrexham and Anglesey experienced little change in the dmft of those with caries experience between 2007/08 and 2011/12. The averages for all 4 unitary authorities during 2011/12 were all within the average range for Wales overall (Figure 9).

ACTIVE DECAY

Figure 10 Average dt for 5 year olds, in unitary authorities within Betsi Cadwaladr University Health Board, 2007/08 compared with 2011/12



Between 2007/08 and 2011/12 there was a statistically significant reduction in average dt for Wales, the values were 1.4 (95%CI: 1.3-1.5) and 1.1 (95%CI: 1.0-1.1) respectively (Figure 10).

Flintshire experienced a significant reduction in average dt between 2007/08 (1.1, 95%CI 0.9-1.3) and 2011/12 (0.7, 95%CI 0.6-0.8). The dt for children in Flintshire for both surveys were statistically significantly lower than the Welsh averages for the same year (Figure 10).

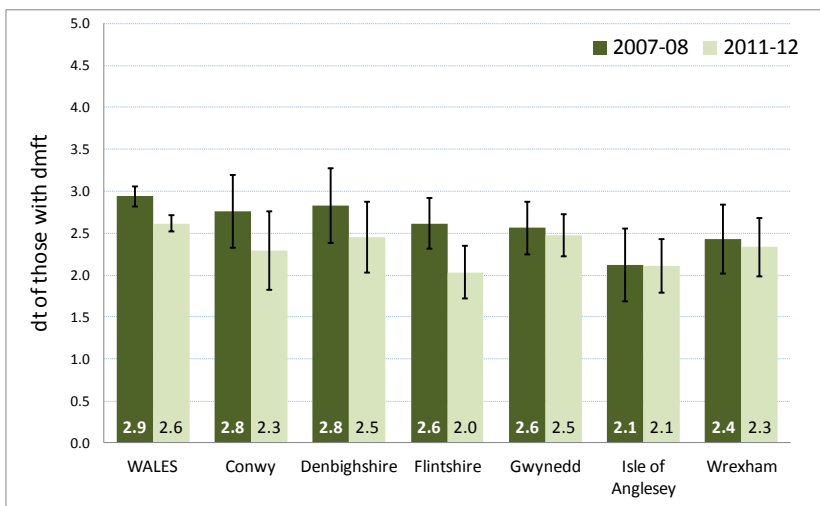
Whilst Denbighshire experienced a notable reduction in average dt across the two surveys, from 1.4 to 1.0, this was not statistically significant.

The average dt for 5 year olds living in Conwy, Gwynedd, Wrexham and Anglesey plateaued between 2007/08 and 2011/12. For example the Gwynedd averages were 1.1 and 1.0 respectively. The 2011/12 averages for all 4 unitary authorities were within the Welsh average range for the same survey.

The average dt of children who have at least one decayed, missing or filled tooth for Wales fell between 2007/08 and 2011/12 from 2.9 (95%CI 2.8-3.1) to 2.6 (95% CI 2.5-2.7). This statistically significant improvement represented a reduction of almost 1/3rd of a tooth (Figure 11).

For the unitary authorities within Betsi Cadwaladr University health board there were small reductions in the average dt of those with caries experience for Conwy, Denbighshire and Flintshire; but these were not statistically significant.

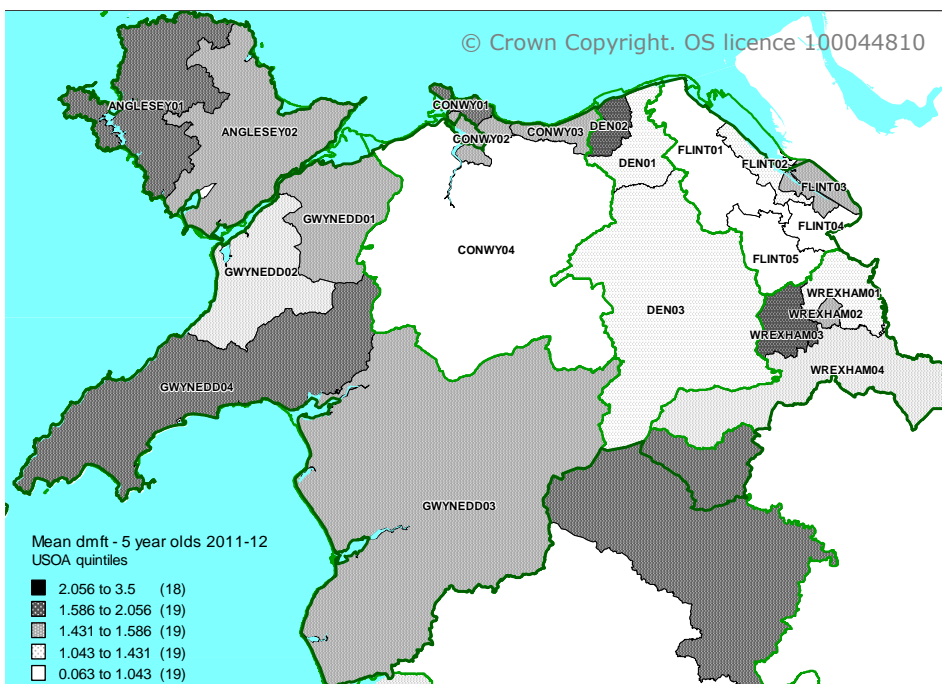
Figure 11 Average dt of those with any experience of caries (dmft) for 5 year olds, in unitary authorities within Betsi Cadwaladr University Health Board, 2007/08 compared with 2011/12



The average dt of those with caries experience for 5 year olds living in Gwynedd, Wrexham and Anglesey plateaued between 2007/08 and 2011/12. The Anglesey averages, for example, were 2.1 at both time points; but these were statistically lower than the Welsh averages for both surveys.

Upper Super Output Areas (USOAs³)

Figure 12 Average dmft for 5 year olds, Betsi Cadwaladr University Health Board USOAs, 2011/12

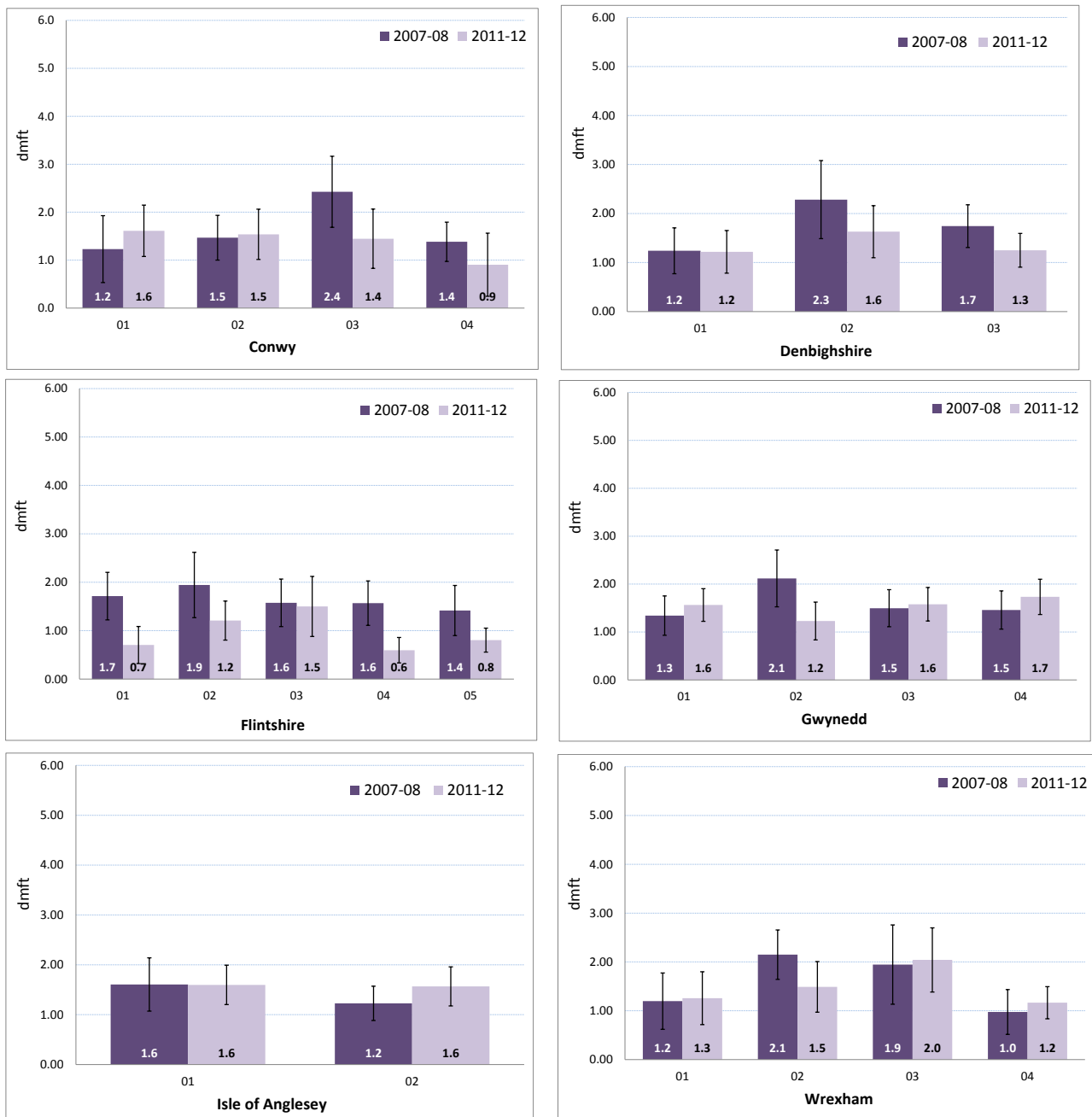


Super Output Areas (SOAs) were designed to improve the reporting of small area statistics and are built up from groups of Output Areas. There are 3 categories of SOAs, i.e. lower, middle and upper.

³ USOAs constitute a statistical geography produced by the Data Unit Wales, based on a set of Super Output Areas produced by the Office for National Statistics. USOAs have been designed to provide a geography of a similar population size that is more detailed than local authority but still large enough to allow a wide range of statistics to be produced, with each of the 94 USOAs in Wales having an average population of 32,000 people.

There are 94 Upper Super Output Areas (USOAs) in Wales (average population approx. 32,000). Figure 12 presents a map of the average dmft for 5 year olds in 2011/12 for the USOAs in Betsi Cadwaladr University health board. Figure 13 highlights the changes in average dmft for these USOAs between 2007/08 and 2011/12.

Figure 13 Average dmft for 5 year olds, for USOAs within Conwy, Denbighshire, Flintshire, Gwynedd, Isle of Anglesey, Wrexham 2007/08 compared with 2011/12



There are four USOAs in Conwy, the dmft in 2011/12 ranged from 0.9 in Conwy 04 to 1.6 in Conwy 01. All 4 experienced changes in dmft between the two surveys but none of these changes were statistically significant - a function of the smaller numbers of children taking part in the survey at this geographical boundary level (Figures 13).

Similarly the three Denbighshire USOAs experienced changes in dmft which were not statistically significant. In 2011/12 average values for dmft ranged from 1.2 in Denbighshire 01 to 1.6 in Denbighshire 02 (Figure 13).

The range in dmft experienced by the 5 USOAs in Flintshire was 0.6 in Flintshire 04 to 1.5 in Flintshire 03 in 2011/12. Both Flintshire 01 and 04 experienced statistically significant reductions in average dmft between the two surveys. Notably the 2011/12 average for Flintshire 04 was also statically lower than the Welsh average for the same survey.

There are four USOAs in Gwynedd, the dmft in 2011/12 ranged from 1.2 in Gwynedd 02 to 1.7 in Gwynedd 04. All 4 experienced changes in dmft between the two surveys but none of these changes were statistically significant (Figures 13).

Anglesey has two USOAs within its boundaries; the dmft was 1.60 in Anglesey 01 and 1.57 in Anglesey 02 in 2011/12. Anglesey 02 experienced a small but not statistically significant increase in average dmft between 2007/08 and 2011/12 (Figure 13).

All four USOAs in Wrexham experienced changes in dmft between the two surveys but none of these changes were statistically significant (Figures 13). In 2011/12 the average dmft ranged from 1.2 in Wrexham 04 to 1.5 in Wrexham 02.

Inequalities in oral health, Wales and Betsi Cadwaladr

Table 1: Average dmft & %dmft>0 for 5 year olds by quintiles of deprivation index, for Wales and Betsi Cadwaladr University Health Board

	5 year olds 2011-12				5 year olds 2007-08			
	WALES		Betsi Cadwaladr		WALES		Betsi Cadwaladr	
	mean dmft	%dmft>0	mean dmft	%dmft>0	mean dmft	%dmft>0	mean dmft	%dmft>0
Least deprived	1.03	31.3	0.94	31.3	1.16	34.5	1.18	35.8
Second least deprived	1.19	32.8	1.23	34.8	1.56	41.3	1.59	43.8
Middle deprived	1.5	41.4	1.58	43.6	1.77	44.1	1.66	42.4
second most deprived	1.88	48.3	1.73	46.9	2.04	49.2	1.87	48.8
Most deprived	2.16	51.5	1.54	46.3	2.65	57.6	2.10	48.3
All within area	1.59	41.4	1.41	40.4	1.98	47.6	1.64	43.4
Ratio - most deprived:middle deprived	1.44	1.24	0.97	1.06	1.50	1.31	1.26	1.14

Although children's oral health has improved on average, inequalities remain. Caries, like many other diseases increases with social deprivation. In Wales, we have the child poverty targets to monitor inequalities in oral health.

As outlined on page 1, the overall aim is to improve the average dmft and the % with caries for the most deprived fifth so that by 2020 they match caries levels experienced by the middle fifth, when the baseline was set in 2007-08. Children from more deprived areas within Betsi Cadwaladr have experienced improvements in oral health between the 2 survey periods—similar to Wales as a whole

(page 1). The ratios of the most deprived: middle deprived have fallen for both average dmft and the %dmft>0, indicative of a narrowing of inequalities, both for Wales and Betsi Cadwaladr.

The average dmft and the %dmft>0 for the most deprived fifth in Betsi Cadwaladr in 2011/12 were 1.54 and 46.3%. The former is already lower than the 2020 target for the most deprived group (2020 target = 1.77) and the latter is only 2% points away (2020 target = 44.1%). It is important to note that the targets are all Wales targets - we do not have health board targets. Dental caries is a preventable disease and there remains room for improvement in the Betsi Cadwaladr area.

USEFUL WEBSITES

Welsh Oral Health Information Unit	http://www.cardiff.ac.uk/dentl/research/themes/appliedclinicalresearch/epidemiology/oralhealth/index.html
PHW observatory	http://www.wales.nhs.uk/sitesplus/922/home
British Association for the Study of Community Dentistry	http://www.bascd.org/
Designed to Smile	http://www.designedtosmile.co.uk/
Child Dental Health survey data	http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Publicationsandstatistics/Bulletins/Chiefdentallofficersbulletin/Browsable/DH_4860753
Adult Dental Health survey data	http://www.hscic.gov.uk/pubs/dentalsurveyfullreport09
Health Maps Wales	http://www.infoandstats.wales.nhs.uk/page.cfm?orgid=869&pid=40976