

Lesley Griffiths AC / AM  
Y Gweinidog Iechyd a Gwasanaethau Cymdeithasol  
Minister for Health and Social Services



Llywodraeth Cymru  
Welsh Government

Eich cyf/Your ref:  
Ein cyf/Our ref: SF/LG/06259/11

Christine Chapman AM  
Committee Chair  
Children and Young People Committee  
National Assembly for Wales  
Cardiff Bay  
Cardiff  
CF99 1NA

14<sup>th</sup>  
December 2011

Dear Christine,

Thank you for your letter of 15 November seeking additional information on issues discussed during my appearance before the Children and Young People Committee on 3 November as part of its inquiry into children's oral health in Wales. The questions raised are highlighted in bold and the response follows:

- **The evaluation of the Design to Smile programme**

The final evaluation report of the initial three year cycle of the Designed to Smile programme is due to be published by the Welsh Oral Health Information Unit at Cardiff University toward the end of January 2012. A copy of the report will be forwarded to the Committee following its publication.

- **The number of children within Local Health Board areas registered with Community Dental Service who fall outside of the scheme**

While the concept of registration no longer forms part of NHS dentistry, the number of children seen by the Community Dental Service is shown in the table below.

**Table 2: Patients by age group and CDS, 2010-11**

CDS	Number of Patients					
	0-4	5-15	16-64	65+	Total	Of which orthodontic
Betsi Cadwaladr	1,900	10,141	7,775	1,440	21,256	924
Powys Teaching	510	2,425	1,125	418	4,478	66
Hywel Dda	1,340	6,497	2,090	217	10,144	278
Abertawe Bro Morgannwg	1,521	4,500	779	342	7,142	438
Aneurin Bevan	1,985	5,928	2,643	2,057	12,613	0
Cardiff and Vale	1,505	15,085	3,691	2,032	22,313	2,036
Wales	8,761	44,576	18,103	6,506	77,946	3,742

Source: Welsh Government

- **Numbers of Children included in the worst quintile who are being targeted to raise levels to the middle quintile**

Using 2007 Mid Year estimates of single data bands there were a total of 127,486 children in Wales broken down by age as follows:

Age 3	32,225
Age 4	31,473
Age 5	30,986
Age 6	32,802

Designed to Smile has targeted some 62,000 children to date almost half of those children aged 3-6.

- **Breakdown of schools, by Local Authority, included in the programme outside of the targeted areas**

Some caution needs to be used when looking at the total target population for the Designed to Smile programme. The schools and nurseries identified for inclusion in the programme are:

- Those in Community First areas;
- Schools and nurseries at the bottom of a list of settings in the area ranked according to the number of decayed teeth; and
- A degree of local flexibility, based on the knowledge of the local demographics by the Community Dental Service teams.

Attached at Annex A is a table which presents the 930 schools and nurseries which have been geocoded out of the 954 taking part in the programme during April 2010 – March 2011 which have been assigned to the deprivation fifth.

In Blaenau Gwent for example 82.6% of settings come from the two most deprived groups because the deprivation is more concentrated within the Local Authority. 60% of settings in Wales come from the second most and the most deprived categories. If the middle deprived group are included that incorporates 80.5% of the total settings. In other parts of Wales the pockets of deprivation will result in a lower percentage of settings which are the most deprived e.g. Denbighshire where 30.3% come from the two most deprived groups.

- **Number of Health Visitors involved in the delivery of Design to Smile programme for the 0-3 elements and how the additional funding is provided**

NHS Health Visitor services do not receive additional funding to support their involvement in the Designed to Smile programme. Designed to Smile forms part of their mainstream health promotion advice and support to parents, working in partnership with key agencies. Data on the number of Health Visitors involved in the delivery of Designed to Smile is not known.

- **The evaluation undertaken by previous Welsh Ministers on the possibility for water fluoridisation and supporting evidence**

During the first Assembly, the Health and Social Services Committee (HSSC) was interested in water fluoridation as a possible topic for a policy review. Two briefing papers on water fluoridation were submitted to HSSC (October 2000 and December 2001) to note. In March 2005 the then Head of Health Protection Division met with Dr Brian Gibbons, Minister for Health & Social Services to decide on whether to commence section 58 of the Water Act 2003.

The outcome of that meeting was that the Minister decided **not** to commence section 58 of the Water Act 2003 in Wales until there is a possibility that the legislation might be used. Currently there are no proposals to commence the amendments to the Water Industry Act 1991 made by the Water Act 2003. These have been commenced in England, but not in Wales. Welsh Ministers are currently able to request fluoridation of water supplies in Wales under section 87 of the 1991 Act as enacted but are not able to instruct water companies to fluoridate.

In December 2006 the then First Minister, Rhodri Morgan, was provided with a briefing paper that offered a number of options. This briefing also contained the two HSSC papers (of October 2000 and December 2001) on fluoridation as background information. The First Minister noted the briefing. The papers referenced above are at Annex B.

- **An example of the letter sent out by Local Education Authority to get parent's permission for involvement in the Dental studies**

The Dental Public Health team have produced a protocol which supports the planning and delivery of the NHS co-ordinated dental survey of school year 1 children in Wales. The protocol outlines processes and standards to ensure the data collected is robust and comparable across Wales. The protocol which includes a letter template to obtain consent for children to take part in the survey is at Annex C.

- **Further information on the methodology for screening Children's teeth**

#### The British Association for the Study of Community Dentistry (BASCD) Surveys

These children are selected by school, based primarily on school size and geographic location. The sample is created according to BASCD criteria, designed to give a representative sample of all children of the age group concerned (now either 5 year olds or "rising" 12s i.e. first and last primary school years). The children are examined to provide epidemiological data. This examination has nothing to do with determining the needs of an individual child. I understand parents of children participating in the BASCD survey would only receive feedback in the very rare event that the dentist doing the survey saw significant oral pathology (e.g. gross sepsis / suspected oral malignancy).

## Screening

Screening is a long established role of the Community Dental Service (CDS). Under this arrangement dentists visit schools and carry out a very general inspection of all children to identify treatment need. A note is then sent home with the child advising parents that the child either sees a General Dental Practitioner or is offered treatment via the CDS.

There are mixed views within the NHS on the efficacy of school screening which has seen England abandon the practise. In Wales, screening remains one of the statutory duties of the CDS. The number of children screened by the CDS, who are not included as part of the Designed to Smile programme, are shown in the table below.

N.B. Aneurin Bevan has linked their child screening with the Designed to Smile programme and therefore it is not recorded here.

**Table 10: Patients screened by category and CDS, 2010-11 <sup>(a)</sup>**

Category	Number of Patients						Total
	Betsi Cadwaladr	Powys Teachin	Hywel Dda	Abertawe Bro Morgannwg	Aneurin Bevan	Cardiff and Vale	
Routine children's screening	2,870	2,570	984	11,701	0	849	18,974
Day centre/hospital	0	0	0	0	21	0	21
Secure unit/prison	0	0	0	0	60	0	60
Adults in residential accommodation	403	116	0	221	921	0	1,661
Other <sup>(b)</sup>	184	0	0	0	0	0	184
<b>Wales</b>	<b>3,457</b>	<b>2,686</b>	<b>984</b>	<b>11,922</b>	<b>1,002</b>	<b>849</b>	<b>20,900</b>

Source: Welsh Government

(a) Table includes routine children's screening and no longer includes figures for "Designed to smile"; this is a change from the 2009-10 release.

(b) Betsi Cadwaladr - Adult learning disability programme

Kind regards  
Lesley

**Lesley Griffiths AC / AM**

Y Gweinidog Iechyd a Gwasanaethau Cymdeithasol  
Minister for Health and Social Services

Number of settings by Welsh Index of Multiple Deprivation 2008 deprivation fifth

	Least deprived	Second least deprived	Middle deprived	Second most deprived	Most deprived	Grand Total
Blaenau Gwent			1	3	6	23
Bridgend	3		5	4	22	50
Caerphilly				2	7	25
Cardiff	12		11	12	16	94
Carmarthenshire	4		5	11	11	35
Ceredigion	4		5	7	2	19
Conwy	1		14	6	18	46
Denbighshire			8	15	1	33
Flintshire	6		7	17	6	50
Gwynedd	2		7	25	12	49
Isle of Anglesey	1			14	10	29
Merthyr Tydfil			2	4	16	45
Monmouthshire			1	1	6	8
Neath Port Talbot	3		5	12	20	65
Newport					2	12
Pembrokeshire			10	14	7	36
Powys	3		3	1	12	21
Rhondda Cynon Taf	3		6	10	27	107
Swansea	5		4	11	17	61
The Vale of Glamorgan	4		8	7	9	33
Torfaen			5	2	10	27
Wrexham	6		17	13	16	62
<b>Grand Total</b>	<b>57</b>		<b>124</b>	<b>191</b>	<b>253</b>	<b>930</b>

% of settings within a UA by WIMD2008 deprivation fifth

	Least deprived	Second least deprived	Middle deprived	Second most deprived	Most deprived
Blaenau Gwent	0.0	4.3	13.0	26.1	56.5
Bridgend	6.0	10.0	8.0	44.0	32.0
Caerphilly	0.0	0.0	8.0	28.0	64.0
Cardiff	12.8	11.7	12.8	17.0	45.7
Carmarthenshire	11.4	14.3	31.4	31.4	11.4
Ceredigion	21.1	26.3	36.8	10.5	5.3
Conwy	2.2	30.4	13.0	39.1	15.2
Denbighshire	0.0	24.2	45.5	3.0	27.3
Flintshire	12.0	14.0	34.0	12.0	28.0
Gwynedd	4.1	14.3	51.0	24.5	6.1
Isle of Anglesey	3.4	0.0	48.3	34.5	13.8
Merthyr Tydfil	0.0	4.4	8.9	35.6	51.1
Monmouthshire	0.0	12.5	12.5	75.0	0.0
Neath Port Talbot	4.6	7.7	18.5	30.8	38.5
Newport	0.0	0.0	0.0	16.7	83.3
Pembrokeshire	0.0	27.8	38.9	19.4	13.9
Powys	14.3	14.3	4.8	57.1	9.5
Rhondda Cynon Taf	2.8	5.6	9.3	25.2	57.0
Swansea	8.2	6.6	18.0	27.9	39.3
The Vale of Glamorgan	12.1	24.2	21.2	27.3	15.2
Torfaen	0.0	18.5	7.4	37.0	37.0
Wrexham	9.7	27.4	21.0	25.8	16.1
<b>Grand Total</b>	<b>6.1</b>	<b>13.3</b>	<b>20.5</b>	<b>27.2</b>	<b>32.8</b>

## **Briefing Paper for the First Minister on Fluoridation of Water Supplies in Wales**

### **Introduction**

1. Following a meeting between Dr Brian Gibbons, Minister for Health and Social Services and the Head of Public Health Protection Division on 3 March 2005 it was agreed that the Welsh Assembly Government would follow a 'basket' of preventive oral health measures rather than adopt water fluoridation as the dental public health policy measure in Wales.

2. The key message that the Welsh Assembly Government has conveyed in relation to the fluoridation of water supplies for sometime is set out below:

*"The Welsh Assembly Government has no current plans to fluoridate water supplies in Wales. The Assembly Government acknowledges that in view of the poor dental health in Wales, the introduction of water fluoridation has the potential to deliver significant health gains and address health inequalities. It is sensitive to the fact that there are some groups opposed to fluoridation."*

### **Background**

3. Following the election of the British government in May 1997, a policy document outlining proposals to improve the health of the nation was published. This document placed a major emphasis on reducing inequalities in health and recognised the continuing poor state of oral health in deprived communities. However, whilst acknowledging the benefits of water fluoridation as a caries preventive measure, the Department of Health suggested that most of the research had been carried out some years ago and furthermore, recognised that strong views were held both for and against fluoridation.

4. The Chief Medical Officer of England commissioned a review to investigate the efficacy and safety of water fluoridation and the contract for the review was awarded to the NHS Centre for Reviews and Dissemination at the University of York (CRD). Due to the specialist nature of the fluoridation review, CRD invited the Dental Public Health Unit at the University of Wales College of Medicine to collaborate on the research, (reference The York Review - A systematic review of public water fluoridation: a commentary BDJ MAY 11 2002, VOLUME 192,)

5. Further background information related to the fluoridation of water supplies is set at Annex A.

### **The Anglesey Experience**

6. Fluoridation was introduced in Anglesey in 1955 following County Council's application to the Ministry of Health in 1951 to be included in a UK pilot scheme. The scheme was initially limited to one water plant but in 1964 was extended to the whole of the island after research showed a 50% reduction in decayed, missing and filled teeth (dmft) in 5 year old children. It was the only major fluoridation scheme to operate in Wales. The fluoridation plants ceased to operate after 1991. The 1994

annual report of the Chief Medical Officer of Wales stated that "since the reduction in, then the withdrawal of, fluoridation in Anglesey there has been a 168% increase in the prevalence of decay in five year old children". There are now no fluoridation schemes in Wales.

### **The Health and Social Services Committee Briefings**

7. The Health and Social Services Committee has been provided with two papers to note on Fluoridation on 25<sup>th</sup> October 2000 and 5<sup>th</sup> December 2001. Copies of these papers are at Annex B and C.

### **The Safety, Benefits and Effectiveness of Water Fluoridation**

8. To our knowledge, the York review was the first systematic review to be undertaken on the subject of water fluoridation. It undertook a rigorous search of the published and unpublished literature of human epidemiological studies in all languages. The protocol was subject to external review as were all intermediate stages of the review. Throughout the review, progress and intermediate findings were published on the worldwide web. A summary of the York Review findings is set out below :-

- The best available evidence suggests that fluoridation of drinking water supplies reduces caries prevalence,
- There appears to be some evidence that water fluoridation reduces the inequalities in dental health across social classes
- There is no clear association of hip or other bone fracture with water fluoridation.
- No associations between cancer and water fluoridation were able to be detected.
- Dental Fluorosis, a mottling of the teeth, was the most widely and frequently studied of all the adverse effects considered. It can occur in a small proportion of individuals.

9. The York Review applied a strict set of modern "research best practice" criteria to its acceptance process of past research studies and therefore many "fluoride supportive" papers were eliminated from the review process. Even with this robust filtering process, the York review confirmed that fluoridation of the water supply can produce a reduction in dental decay in children of at least 15%. There is also accumulating evidence of the benefits of fluoridation to the oral health of adults. It is more effective in reducing health inequalities than campaigns to improve oral hygiene and diet.

10. Summing up, neither the University of York nor the Medical Research Council (MRC) in their report of September 2002 found evidence of harm to overall health where water is fluoridated at the optimum level of 1 part per million.

11. The Wales BMA has for many years been in favour of the fluoridation of mains water supplies supporting the policy on the grounds of effectiveness, safety and equity. On the cost-effectiveness of water fluoridation the BMA states - "Studies comparing the cost-effectiveness of water fluoridation compared with other strategies



for reducing caries always conclude that water fluoridation is the most cost-effective approach. (University of York, Health Economics Consortium)

## **Reducing Inequalities**

12. There is a close correlation between levels of social deprivation and dental disease. The Welsh Assembly Government has introduced targets to reduce child poverty in Wales. There are 2 dental targets to reduce dental caries in 5 and 12 year old children in Wales. Water fluoridation is the single most effective public health measure available to combat high levels of tooth decay and inequalities in oral health and benefits everyone irrespective of behaviour.

e.g. fluoridation in Birmingham since 1964 has meant that, despite the high levels of social deprivation, it has some of the best levels of dental health in England. More 5-year olds (68.5%) are completely free from tooth decay in the West Midlands than in any other part of the UK. Compare this to Wales where over 50% of our 5 year olds have suffered tooth decay. It should be noted that most of that disease burden is carried within the children from the most deprived areas of Wales.

## **Water Act 2003**

13. The Water Act 2003 amends the Water Industry Act 1991 enabling the Assembly to request water undertakers to enter into fluoridation schemes. It requires the Assembly to make regulations governing the public consultation prior to making a request to a water undertaker. It enables the Assembly to reduce the target concentration of fluoride from one milligram per litre to a lower concentration by order so long as the areas to which it relates are in Wales. It provides for the Assembly to meet the costs of fluoridation and to indemnify water undertakers in respect of liabilities incurred by water undertakers in complying with fluoridation arrangements. There is also provision for dealing with England and Wales cross border arrangements and for the relevant authority to be required to monitor, analyse and publish reports every four years on the health effects of the fluoridation arrangements.

14. The Water Act 2003 received Royal Assent on 20 November 2003 and the Assembly delegated Section 58 to the First Minister on 8<sup>th</sup> December. The next legislative steps would be for the Assembly to commence Section 58 by order and for the Welsh Assembly Government to consult on draft regulations governing the public consultation arrangements. Section 58 of the Water Act 2003 attempts to overcome previous difficulties in establishing water fluoridation schemes by amending previous fluoridation legislation to make it a requirement for water providers to fluoridate water supplies where they are requested to do so by the relevant health body. However the relevant health body must first consult with the local population and must cover the costs incurred by the water provider.

15. The Health Minister has decided not to commence the legislation as yet until there is a possibility that it might be used. There are 11 properties in Wales (Elan Valley) that are receiving fluoridated water from a Birmingham and West Midlands fluoridation scheme. Once Section 58 is commenced in Wales these properties would become the responsibility of the Assembly including the health monitoring

referred to above unless a Section 41 Agreement could be formed with the two Strategic Health Authorities in England for them to retain responsibility for these properties. The fact that Wales has not implemented the legislation would need to be revisited if England wished to proceed with a cross border scheme. If such a scheme was proposed then DH might be able to influence English Strategic Health Authorities to enter a Section 41 agreement so that they retain responsibility for the 11 Elan Valley properties in Wales.

### **Differences in England and Wales Position**

16. In England, the relevant authority is the Strategic Health Authority. In Wales, the relevant authority is the Assembly. This means that there are significant differences in the role of the Secretary of State and that of the Assembly in relation to fluoridation arrangements.

17. The Secretary of State's role is to:

- make the necessary subordinate legislation;
- issue indemnities to water undertakers (note that if he fails to do so, this could prevent a fluoridation arrangement from going ahead); and
- resolve disputes between strategic health authorities and water undertakers.

The Assembly also has all these responsibilities.

18. The Secretary of State/Department of Health is not involved in:

- developing proposals for new fluoridation schemes;
- consulting water undertakers on the feasibility of schemes;
- consulting the public on proposed schemes;
- making a decision on the outcome of the consultation;
- negotiating with water undertakers over the terms of schemes;
- funding the capital and running costs of schemes; or
- assessing the health effects of fluoridation schemes.

In Wales, all these functions fall to the Assembly.

### **Funding**

19. The Office of the Chief Medical Officer currently have no budget for fluoridation but have registered it with DHSS Resource Directorate as an unfunded pressure. A bid for resources was made for staff to take forward fluoridation and for programme expenditure to fund an all Wales scheme but was unsuccessful.

### **Cost of fluoridation**

20. Up-to-date costings for implementation in Wales are not available but a Technical Feasibility Study carried out in 1997 by Hyder on behalf of the Welsh Health Authorities stated that the capital cost for installing fluoridation plant at each of the then 121 water treatment works in Wales was £21 million. The recurrent annual running costs were estimated at just over £1 million. The paper submitted to

the Health and Social Services in December 2001 estimated capital costs of fluoridating all the water in the Dwr Cymru Welsh Water area at £24.3 million.

21. Department of Health advise that running costs of fluoridation schemes are negligible: of the order of 40 to 50p per head of population per year. This compares very favourably with the cost of restorative dental treatment. A more targeted approach or incremental implementation would reduce or spread the costs. The option to fluoridate areas of Wales on a smaller geographical area basis would need to be explored with the water undertakers.

22. Another approach would be for Dwr Cymru to meet the majority of the initial capital costs with government then agreeing to pay enhanced annual payments that cover running costs and additionally compensate the initial capital investment. The cost of installing plant to fluoridate water for a population of five hundred thousand might be around £1m. Then the recurring costs of the fluoride plus the maintenance of the plant would be about 40p per person per year.

## **Position in other UK countries**

### **England**

23. A number of water fluoridation schemes operate in England. Senior English Ministers have publicly supported fluoridation and Strategic Health authorities have been encouraged to adopt schemes as an oral public health measure. The Chief Dental Officer – England wrote to Strategic Health Authorities and Primary Care Trusts in England in September 2005 to explain why fluoridation offers them a realistic option of reducing health inequalities and which trusts should consider as part of measures to improve the oral health of their populations. The Oral Health Plan for England encourages public consultations on water fluoridation and if there is local support, the SHA can make arrangements with the local water company to fluoridate its water.

### **Scotland**

24. The fluoridation provisions of the Water Act 2003 do not apply in Scotland and the Scottish Executive recently announced that they would not be introducing legislation to enable fluoridation schemes in Scotland. Instead they would focus on a basket of other oral health interventions.

### **Northern Ireland (NI)**

25. There is currently no fluoridation of water supplies in NI and no legislative provision to accommodate it. The NI Assembly did consider the issue previously but it did not result in any further action. The Water and Sewage Services (Northern Ireland) Order 2007, which will come into force in April 2007, will make provision for the introduction of fluoridation in a similar fashion to that in place in the rest of the UK. The health authority (currently the 4 Health and Social Services Boards, but a single Health and Social Services Authority from April 2008) can consult on fluoridation and request Water Service to introduce it. (NI do not currently have any water companies, but rather a single government agency which is in the process of

becoming a Government Company or 'Go-Co'). Indemnity would fall to the health authority.

### **Assembly Funding for the British Fluoridation Society**

26. The British Fluoridation Society has agreed to undertake additional work in 2006/07 as part of the Service Level Agreement and as agreed with the Health Minister. The BFS is preparing a report outlining the background to the water fluoridation section (Section 58) of the 2003 Water Act; describing the implications of the amendment for future water fluoridation proposals in England and Wales; outlining colleagues' suggestions as to what, if anything, they would do differently if the English Consultation Regulations were to be revisited; and outlining the development and contents of a Consultation Toolkit being developed by the BFS. This work will enable the Assembly to learn from the English experience.

### **Opposition to Fluoridation**

27. Water fluoridation is a subject that, despite past public polls demonstrating a majority of public support, attracts controversy. The British Dental Association and the wider dental profession (with some individual exceptions) is also in favour of fluoridation. However, there are groups which are opposed to it. Their objections relate to: concerns about adverse health effects; opposition to compulsory medication (as they see it) and the attendant human rights implications; freedom of choice; and arguments that alternative, more targeted, oral health interventions should be pursued instead.

### **Achieving the new dental targets**

28. These targets, see para 12, are achievable but only if additional funding is committed to "getting more teeth in contact with fluoride". This can be done in one of two evidence-based methods:-

- i. Water fluoridation would achieve the required health gain across the whole population and not just the most deprived fifth. By 2020 (probably well before) Wales would move from its position amongst those countries with the worst dental health in the developed world to the amongst the best.
- ii. through a major increase in the provision of national preventive programmes e.g. fluoride toothpaste and toothbrushing schemes.

### **Options to Implement Water Fluoridation in Wales**

29. There would be a number of hurdles to overcome before the Welsh Assembly Government could implement a water fluoridation scheme in Wales. This includes the commencement and introduction of Section 58 of the Water Act 2003 in Wales and the allocation of resources to fund the policy measure. Options for implementing fluoridation of water supplies in Wales might include:-

- a. Fluoridating all water supplies in Wales in one phase. This would have considerable financial implications, see para 17, and there would also be practical problems during implementation involving cross border issues.
- b. A staged approach to fluoridate all water supplies in Wales. This would have the advantage of implementing some water fluoridation in Wales earlier than option (a) but costs may remain significant due to the geographical areas covered remaining large scale because of the complexity of the water supply network.
- c. Selective targeted fluoridation of water supplies on a smaller area basis identifying areas of poor oral health that might benefit the most from fluoridation.
- d. Do nothing on fluoridation.

30. Officials consider that if Ministers wish to implement a water fluoridation policy in Wales then the next step should be the commissioning of a feasibility study from the water undertakers supplying Wales to identify the practicalities and scope the possible options open to the Assembly. The study would include estimation of cost for implementing a scheme(s) and offer more insight into the cross border implications. The study would provide the Assembly with up-to-date information on practical options that would best enable informed decision making.

### Human Rights

1. There is a concern that some people have that fluoridation is incompatible with Article 8 of the European Convention on Human Rights Right to Respect for Private and Family Life arguing that it is mass-medication. In the only case under the European Convention on Human Rights concerning fluoridation (a Swiss case) the European Commission on Human Rights considered that it did not need to consider the issue of whether an interference with the right to respect for private and family life arose, because any such interference would be justified by the benefits to oral health.

2. Since fluoride occurs naturally in water, it cannot be compared to a discretionary medicine. The Medicines Control Agency (MCA) considers that neither fluoride added to drinking water nor the resulting fluoridated water are medicinal products which require marketing authorisations as medicines do. The MCA do not consider that the chemicals used in water fluoridation schemes merit licensing because, at the very dilute rates at which they are added to water (0.7ppm - 1ppm), no evidence has been found of risks to health.

### Fluoride concentration in water

3. Natural concentration varies. Fluoridation is an adjustment, usually an addition, to gain the highest level of anti-tooth decay whilst minimising risks of discolouring or mottling of teeth. In general terms the optimum level for dental health benefits is one milligram of fluoride per litre of water in temperate climates such as the UK, i.e. 1 part per million the level at which fluoridation schemes operate in this country. Around six million people in England receive water from supplies that naturally contains 1 ppm of fluoride.

### Fluoride Intake

4. The Government monitor levels of fluoride in water and diet. In 2000, the Food Standards Agency published a survey of fluoride levels in the 1997 Total Diet Study. These showed no evidence of an increase in dietary fluoride intake in recent decades.

### Dose control

5. The process of fluoridation is governed by safety regulations enforced by the Drinking Water Inspectorate. Fluoride levels are monitored at several points before treated water enters the mains supply and failsafe mechanisms ensure that operations are automatically shut down and alarms sound if fluoride levels exceed the permitted limit.

### Dental fluorosis

6. Dental fluorosis (sometimes evident as flecking or mottling of the teeth) is the one recognised side effects of water fluoridation, although the affected teeth are still endowed with the same protection from dental decay. In its more extreme forms, dental fluorosis may be aesthetically unacceptable but this is usually treatable. Only in extremely rare and severe cases is it prejudicial to the long-term health of the tooth.

7. The MRC recommended the Department of Health undertake research into public perceptions of dental fluorosis and they will be acting on this recommendation.

### **Skeletal fluorosis**

8. Similar all elements and compounds excessive intakes, of fluoride can be harmful. Skeletal damage can be caused in extreme cases, but there is no evidence of this at the levels of exposure which occur in temperate, developed countries.

### **Chemicals used in fluoridation schemes**

9. The technical process for adding fluoride to water is a relatively simple procedure for water engineers who have vast experience of treating water supplies with a variety of chemicals. The chemicals used in water fluoridation are no more hazardous than many others already used routinely by water companies.

10. Hexafluorosilicic acid is used in fluoridation of public water supplies. It is not, as is often alleged, derived from fertiliser production scrubbing operations. It is manufactured in tandem with production of phosphoric acid, which is made by adding sulphuric acid to "fluoro-apatite", a mineral rock containing silica and small amounts of fluorides. The reaction liberates silicon tetrafluoride as a vapour, which is bubbled through the water and then dissolves to form hexafluorosilicic acid.

### **Fluoridation in Other countries**

11. Worldwide: over 300 million people drink artificially fluoridated water - including around 65% of the population of the United States. During August 1999 Los Angeles, the 2nd largest US city, began fluoridating supplies to its 4 million citizens. Canada still has extensive water fluoridation serving over 13 million people (i.e. approx. 40% of the population).

**Date:** Wednesday 25 October 2000  
**Venue:** Committee Room 2, National Assembly for Wales  
**Title:** **Fluoridation of Water Supplies**

**Purpose**

1. To help the committee decide whether it should have a substantive discussion on the Fluoridation of Water Supplies and, if so, to identify the issues it should address.
2. This paper covers A) the background, including the legal position; B) the conclusions of report from York University; C) the health advantages and disadvantages of fluoridation; and D) other options for effective fluoride treatment.

**Recommendation**

3. The Committee is invited to note the paper. The paper has been copied to the Clerk of the Environment, Planning and Transport Committee as it also has an interest in the fluoridation of water supplies.

**Timing**

4. The Committee asked that this paper be submitted to it's meeting on 25 October.

**A) BACKGROUND**

5. The scientific evidence to date supports the view that fluoridation of drinking supplies at levels of 1 part per million is a safe (World Health Organisation recommended fluoride level for temperate climates) and beneficial measure that significantly reduces tooth decay. The fluoride ion is a natural component of all water supplies. Over 5 million people in the UK receive water whose fluoride content is naturally occurring or artificially supplemented to levels between 0.7 and 1part per million. There are presently no artificially fluoridated areas in Wales

**Fluoridation in Anglesey**

6. Fluoridation was introduced in Anglesey in 1955 following Anglesey County Council's application to the Ministry of Health in 1951 to be included in a UK pilot scheme. The scheme was initially limited to one water plant but in 1964 was extended to the whole of the island after research showed a 50% reduction in decayed, missing and filled teeth (dmft) in 5 year old children. It was the only major fluoridation scheme to operate in Wales. The fluoridation plants ceased to operate after 1991. The 1994 annual report of



the Chief Medical Officer of Wales stated that "since the reduction in, then the withdrawal of, fluoridation in Anglesey there has been a 168% increase in the prevalence of decay in five year old children".

### **Legal Position**

7. There is no requirement on water companies to fluoridate. S 87 of the Water Industry Act 1991 (which incorporated the 1985 Fluoridation Act) provides that "Where a Health Authority have applied in writing to a water undertaker for the water .....to be fluoridated, that undertaker may .....increase the fluoride content of the water...." In a legal case involving Northumbrian Water, Mr Justice Collins held that a water company does not have the same duty to improve health as a public body and can consequently turn down the requests of health authorities to fluoridate. The health authority is required by S 89 to advertise a proposal for fluoridation in one or more newspapers circulating within the area affected by the proposal; and to give notice to every local authority whose area falls wholly or partly within that area. In determining whether to proceed, the health authority is required to have regard to any representations made to them and to any consultations with local authorities.

8. The Act gives the Assembly powers:

a. to amend the way in which fluoride is added to the water as prescribed by Section 87(4) of the Act.

b. to agree indemnities for water undertakers in respect of fluoridation schemes.

The powers under Sections 87 to 91 of the 1991 Act have been delegated to the Assembly Secretary for Environment, Transport and Planning.

9. If the Government proposed to introduce primary legislation requiring water undertakers to fluoridate, the National Assembly for Wales would be consulted. Section 31 of the Government of Wales Act 1998 requires appropriate consultation between the Secretary of State for Wales and the National Assembly, on the Government's legislative programme. Under S33 of the Act the Assembly may consider and make appropriate representations about any matter affecting Wales.

### **Position of the water companies**

10. Water supplied for domestic purposes is subject to stringent statutory safeguards. To be wholesome water must contain no more than the statutory maximum of 1.5 milligrams fluoride per litre. This compares with the optimum level of 1 milligram per litre recommended for fluoridated water. A breach might result in enforcement action against the company. Excess levels of fluoride might also render water unfit for human consumption, the supply of which is a criminal offence. At present indemnities are provided to water companies carrying out fluoridation at the request of health authorities but these are restricted to civil liability claims and do not cover indemnity against criminal proceedings which might be brought if unfit water was supplied.

11. Water in Wales is mainly supplied by Welsh Water, with some parts in North Wales receiving water from Dee Valley Water plc and parts of the Shropshire border area receiving water from Severn Trent Water Company. A Technical Feasibility Report prepared by Hyder Consulting confirmed that there were no insurmountable technical difficulties to fluoridating the water supplies in Wales and Herefordshire. Welsh Water has stated that it will not accede to a Health Authority request to fluoridate unless it is required to do so as a consequence of a change in the legislation. This is because fluoridation would increase - albeit only slightly - the potential of the company being prosecuted for supplying water unfit for human consumption. The Northumbrian Water case confirmed that a water company was entitled to refuse a request to fluoridate on such grounds.

### **Competition in the water industry**

12. A consultation paper was issued in April on ways of increasing competition in the water industry. One option discussed is "common carriage" ie shared use of the supply pipes and other infrastructure of an existing water supplier by a third party to enable the third party to provide water services in the supplier's area. The paper recognises this may impact on the consistency of fluoridation arrangements.

### **Public Opinion**

13. Public opinion on fluoridation was canvassed in the Welsh Office consultation document "Better Health, Better Wales" (May 1998), and the majority of respondents favoured the fluoridation of water supplies. National surveys have also consistently measured support for fluoridation in the region of 70%. There is also a vocal minority of people who are strongly opposed to water fluoridation on grounds of its potential adverse effects and the removal of choice implicit in fluoridating water supplies.

### **Environmental issues**

14. There are concerns about the impact of fluoridation on the aquatic environment. Fluoridated water would, after use, be discharged into watercourses or the sea from sewage works. This would have little impact on the marine environment because natural fluoride concentrations are already higher than fluoridated drinking water. However, more work needs to be done to assess the impact on fresh waters.

## **B) CONCLUSIONS OF THE YORK UNIVERSITY REVIEW**

15. The NHS Centre of Reviews and Dissemination at the University of York was commissioned to "carry out an up to date expert review of fluoride and health". The review was published on Friday 6 October 2000. This is a review of epidemiological studies of water fluoridation and aims to provide a systematic review of the best available evidence on potential positive and negative effects of water fluoridation. Ethical issues, environmental impacts, cost and legal issues are outside the scope of the review.

16. The results of the review can be summarised as follows:

water fluoridation reduces the prevalence of dental decay (estimated mean reduction is 15.5% in decay free children and a reduction of 2.2 teeth affected by decay -ie In a fluoridated area 15.5% more children will have no experience of dental decay);  
stopping water fluoridation increases the prevalence of dental decay in the area that had been fluoridated compared to the control area;  
the beneficial effect of water fluoridation was evident inspite of assumed exposure to fluoride from other sources;  
there is some evidence that water fluoridation reduces inequalities in dental health in 5 and 12 year olds ( but the studies are very limited);  
at 1.0 part per million, the optimum level for water fluoride content, the prevalence of fluorosis (as defined in this report) is 48% but the percentage causing aesthetic concern is approximately 12.5%. (It should be noted that at levels of 0.1 parts per million the review quotes a figure of 6.3% that have fluorosis of aesthetic concern).  
there were no clear associations between bone fractures and water fluoridation or between cancers and fluoridation;

17. The report involved a systematic review of water fluoridation based on the research evidence accepted by the Review. That evidence was assessed for quality using criteria as follows: Level A = Highest quality of evidence, minimal risk of bias; Level B = Evidence of Moderate Quality, moderate risk of bias; and, Level C Lowest quality of evidence, high risk of bias. The review found that few studies were of level A quality and the report acknowledges that the primary limitation of the review is the quality of the research included. Such limitations are not surprising when undertaking such a large systematic review that extends back to the late 1930s and applying year 2000 standards. In the case of the evidence on natural versus artificial fluoride sources the evidence was not adequate to reach a conclusion.

### **C) HEALTH ADVANTAGES AND DISADVANTAGES**

18. The evidence to date confirms that fluoridation improves dental health with no major proven health risks, such as bone fractures and cancers. Other potential adverse effects require further studies. Dental fluorosis of aesthetic concern which causes an unsightly mottling of the teeth, occurs in a small proportion of individuals but this can be removed by NHS treatments and it does not affect the protective effect of the fluoride.

19. Fluoridation primarily benefits young children. Evidence of juvenile dental caries makes it clear that the exercise of parental responsibility to minimise dental ill-health is not sufficient. Dental decay can blight the lives of very young children; in some the effects are so severe that they need removal of first teeth at the age of 2 or 3. Areas in England where 75% or more of the population are benefiting from fluoridated water feature in the top seven areas in the UK with the least number of dental decay in 5 year old children in the period 1997/98. Water fluoridation also reduces dental

caries in adults and this becomes increasingly important in the light of demographic changes towards an older population.

20. "Better Health, Better Wales " said "Dental decay is almost entirely preventable. The evidence is that fluoridation of drinking water supplies to the optimum level can reduce tooth decay by upwards of 50%". It set a health gain target for oral health:

"to reduce the proportion of children experiencing dental caries ( decayed, missing, filled teeth) of 1 or more) by 5 percentage points as measured in British Association for the Study of Community Dentistry Co-ordinated Surveys from 53% of 5-year olds in 1995 to 48% by 2002, and from 64% of 14-year olds in 1994 to 59% by 2002 and from 64% of 14 year olds in 1994 to 59% by 2002."

21. Current progress against this target has been slow: preliminary results from the 1999/2000 British Association for the Study of Community Dentistry Epidemiological Survey shows that 52% of 5 years olds have a dmft of one or more - a 5% improvement on 1995 but still 4% off the target of 48% by 2002. For 14-year olds the latest position as at 1998/99 shows a 63% figure, only a 1% improvement on 1995 but 4% below the target for 2002. At this rate of progress it looks unlikely that both these health gain targets will be reached.

22. In Wales there are statistical associations between inequalities in oral health and social deprivation. For example, in Monmouth 47% of 5 year olds have one or more decayed, missing and filled teeth (ie the health gain target has been reached), while in Blaenau Gwent the figure is 67% which is 18% off the target.

#### **D) OTHER OPTIONS FOR EFFECTIVE FLUORIDE TREATMENT**

##### **Fluoride toothpaste, gel or tablets**

23. In England, toothpaste schemes are being piloted to test whether they reduce the prevalence of dental caries in deprived areas. We have no toothbrushing schemes co-ordinated on an all-Wales basis.

There is less likelihood that those in most need of dental health care, particularly children in deprived areas, will use such products on a regular basis.

##### **Fluoridated school milk**

24. There are currently 4 milk fluoridation schemes being piloted in England reaching some 17,000 school children. Access to this starts later than optimal and it may be subject to compliance problems. The National Assembly for Wales would need to fully explore the powers available, associated costs and practicalities of introducing such a scheme.

##### **Fluoridation of Salt**

25. There is evidence to suggest that the fluoridation of salt is a highly cost effective method of reducing dental caries. However, the use of fluoridated

salt is perceived to be in conflict with medical advice to reduce sodium consumption.

**Date:** Wednesday 5 December 2001  
**Venue:** Committee Room 3, National Assembly for Wales  
**Title:** Fluoridation of water supplies in Wales

### **Purpose**

1. To provide the Committee with further briefing on fluoridation to update and expand on the paper to note submitted to the Health and Social Services Committee meeting on 25 October 2000.

### **Summary/Recommendation**

2. The Committee is invited to note the paper to assist it in reaching a decision on programming a discussion. The paper has been copied to the Clerk of the Environment, Planning and Transport Committee which also has an interest in the fluoridation of water supplies.

### **Timing**

3. The Committee asked that this paper be submitted to its meeting on 5 December.

### **Background**

4. The paper [HSS-18-00\(p.5\)](#) sets out the background to fluoridation of drinking water in this country. Members should refer to this for :

Background: legal, water industry, public opinion  
the conclusions of the York University Review  
the health advantages and disadvantages  
and other options for fluoride treatment.

5. This paper covers:

dental health in Wales  
National Assembly oral health initiatives  
the ethics of fluoridating water supplies  
fluoridation - world view  
fluoridation in Wales: practical and technical issues  
cost benefits  
health restructuring  
competition in the water industry  
further research  
conclusions

## Dental Health in Wales

6. Wales has relatively poor dental health. Annual childhood dental surveys by the British Association for the Study of Community Dentistry (BASCD) measure dental decay by the number of decayed, missing or filled teeth (dmft). The BASCD surveys demonstrate wide variation in the prevalence of dental caries across the UK. The surveys show that :

dental health in Wales is poor by comparison with England - see graph 1 at Annex A.

the prevalence of dental decay in Wales are similar to the worst area of England while deprived areas of England with fluoridated water supplies have lower prevalence of decay than less deprived areas in Wales - see Graph 2 at Annex A.

considerable dental health inequalities exist in Wales, closely linked to deprivation - see graph 3 at Annex A which compares mean dmft in the 5 best dental planning areas with mean dmfts in the 5 worst e.g., in Tredegar and Dolgellau they are 7 times higher than in Rhiwbina, Cardiff.

7. The 1999/2000 BASCD survey shows that 52% of children in Wales have tooth decay by the time they are 5 years old and on average those children have 4 decayed or missing teeth. Levels of decay at this age are an indicator of future decay. The latest evidence shows that at age 14, 63% of children surveyed have suffered dental disease.

8. The Welsh Office set health gain targets, reiterated in Better Health Better Wales, October 1998, for reducing the levels of decay in 5 and 14 year olds:-

*"to reduce the proportion of children experiencing dental caries (decayed, missing or filled teeth (dmft) of one or more) by 5 percentage points, as measured in BASCD co-ordinated surveys, from 53% 5 year olds in 1995 to 48% by 2002."*

The target set for 14 year olds is to reduce to 59% the proportion of 14 year olds with dental decay. Although there has been some modest progress, it is improbable that even these targets for improving dental health will be met.

9. The results of the 1998 UK Adult Health Survey show that more adults in Wales are retaining their natural teeth. However, there are differences between the four UK countries - the proportion with no teeth was 17 % in Wales compared to 12% in England. As fluoride acts on the surfaces of the teeth after eruption, there is a potential for the dental health of adults to benefit from fluoridation.

## Other Oral Health Initiatives

10. This year Health Authorities have been allocated recurrent funding from the Health Inequalities Fund, for a 3 - year dental fissure sealant programme targeted on the deprived areas identified for the Communities First programme. This programme will be delivered by the Community Dental Service through schools in those areas and once the programme is established, further consideration will be given to the possibility of involving

general dental practitioners. The programme will cost about £0.5m per year. The target population for 2001-2 is approximately 18, 000 children.

11. The fissure sealants will be provided as part of an overall health promotion package to those children whose first teeth have suffered from a significant level of dental decay e.g. children who have experienced dental caries in two or more molar teeth. The aim is to prevent dental decay in the secondary molar teeth of these children by treating the surface of four teeth and by education.

12. This programme is not a substitute for fluoridation and education packages have not been demonstrated to be effective. It is generally accepted by dental public health professionals that fluoridation is the basis upon which other preventative programmes should be built.

### **Ethical issues**

13. The ethical debate on fluoridation of water supplies is a highly contentious one. On the one hand, it is argued that fluoridation involves a loss of individual freedom of choice and the provision of mass medication (medication is generally seen as an important area for personal choice). On the other, the argument is about depriving those most at risk of dental decay of the known benefits of fluoridation.

14. It could be argued that enforced medication constitutes a breach of Article 8 of the Convention i.e. the right to respect for private life and therefore a breach of the Human Rights Act 1998. The Article provides for exception to this right where a public authority is acting "in accordance with the law and is necessary in a democratic society" for the protection of health.

15. The principle of proportionality is an important theme in Convention case law. The Court has reminded that

*"inherent in the whole of the Convention is a search for a fair balance between the demands of the general interest of the community and the requirements of the protection of the individual's fundamental rights"*

(Eur Court HR *Soering v UK*, judgement of 7 July 1989 Series A no 161, 11EHRR 439)

16. The principle of proportionality recognises that human rights are not absolute and that the exercise of an individual's rights must always be balanced by the broader public interest.

17. Most naturally occurring water supplies have some level of fluoride present. In some areas, such as Hartlepool, the natural concentration of fluoride occurs at the optimal level and benefits dental health. In view of this, it is difficult to argue that the right to a fluoride-free water supply is a basic civil right. The purpose of artificial fluoridation is to replicate the beneficial effects observed in communities receiving water with fluoride naturally present within the range 0.7 to 1 ppm.



18. It has been argued that fluoridation itself can cause harm to health. The conclusions of the York University Review of fluoride and health are set out in the previous paper, para 16 and 17, and the health advantages and disadvantages discussed in paragraphs 18-22. The evidence to date confirms that there is no major proven health risk but dental fluorosis, a mottling of the teeth is known to occur in a small proportion of people living in fluoridated areas.

19. It has further been argued that there are other equally effective methods of preventing dental decay. Behavioural change through education is, however, difficult, slow and expensive with children from disadvantaged backgrounds being least likely to benefit. There is very little evidence that education is effective.

20. On the other hand it can be argued that a public authority has an ethical responsibility to make available those measures which can achieve significant health gain. Why should those who insist on their individual freedom of choice be permitted to impose the pain and suffering of dental disease on others, and in particular the most disadvantaged ?

#### **Fluoridation - World-wide**

21. In 1958, a World Health Organisation (WHO) Expert Committee on Fluoridation summarised its findings by stating *'the effectiveness, safety and practicability of fluoridation as a means of preventing dental carries, one of the most prevalent and widespread diseases in the world, is now well established'*<sup>1</sup>

22. Today, there are 40 countries world wide with national water fluoridation programmes, with an additional 40 million people served by water which is naturally fluoridated at equivalent levels.<sup>2</sup> In the United States alone over 10,000 communities and 145 million Americans are served by fluoridated water supplies. One of the most recent U.S cities to fluoridate was Los Angeles with a population of 3.5 million.

#### **Fluoridation in Wales: Practical and Technical issues**

23. There are 3 water companies providing mains drinking water in Wales. Dwr Cymru Welsh Water ( DCWW) covers most of Wales and most of Herefordshire, a population of about 3 million. See the map at Annex B. Dee Valley Water supplies water in parts of North East Wales and Chester. The remaining area in central Wales is supplied by Severn Trent. Severn Trent already operate fluoridation plants for fluoridation schemes in England. Discussions would need to be held with the companies on any proposal to fluoridate and the areas to be covered. Welsh Water's policy has for a number of years been as follows:

*"Welsh Water's principal role is to provide supplies of wholesome water. We believe that any proposal to increase levels of fluoride does not contribute to the wholesomeness of the supply and currently we have not entered any agreements with health authorities to fluoridate water. However, if changes are made to legislation which requires the addition of*

*Fluoride and provide appropriate indemnification we would clearly comply with our legal requirements."*

24. Following an approach in the Spring of 1997, from the All Wales Fluoridation Steering Group of the Welsh Health authorities, Hyder Consulting has undertaken a study into the technical implications of fluoridating water supplies in the Dwr Cymru Welsh Water (DCWW) supply area in Wales and Herefordshire. This study has been provided to the National Assembly, courtesy of the Welsh health authorities, and the following is drawn from its conclusions.

i) Water Supply

25. In DCWW's supply area there are 204 water supply zones, 128 water treatment works and 5 bulk supplies from Severn Trent Water. The water supply zones are discrete areas throughout which the water quality is dependent on the same source or sources ie there are no cross-connections with other zones. Most areas are supplied by more than one water treatment works. To provide fluoridated water to a zone the fluoride must be added at all the water treatment works supplying the zone. The most complex relationship between a water supply zone and water treatment works is the Southern Conjunctive Use scheme serving Cardiff and the surrounding areas. To supply fluoridated water to any of the water supply zones in Cardiff, all water sources supplying the area would need to be equipped with a fluoridation plant.

26. Any proposal to fluoridate the bulk water supplies provided by Severn Trent Water would need to be considered by that water undertaker. A detailed investigation would be required to check on the feasibility to install a fluoridation plant on the pipelines that supply this area.

27. DCWW's 128 treatment works range in capacity from those serving 10 people to populations of about 700,000. They range from small springs and boreholes with simple chlorination as the only water treatment to others with complex processes. The equipment and space requirements for a fluoridation plant are similar at all installations regardless of the size or complexity of the supply to be fluoridated.

ii) cost

28. The cost of any fluoridation scheme can be broken down into capital costs for plant and for each water treatment works and operational costs of chemicals, electricity, equipment maintenance, monitoring, sampling analysis and reporting.

29. The estimated capital costs of fluoridating all the water in the DCWW area through each of its 121 water treatment works were £21.7 million with annual running costs of £1.3 million. Equivalent figures at current prices would be £24.3m capital and £1.5m running costs.

30. However, since the cost of installing fluoridation plant is the same for each water treatment works regardless of the size of population it serves,

the cost of supplying fluoridated water in some areas would be high relative to others. It plant were only provided at treatment works with a larger capacity (more than 2 megalitres (mld) per day) then the estimated capital costs would be £12.6m with annual operational costs of £1m. Equivalent figures at current prices would be £14.1m capital and £1.1m running costs.

### iii) Fluoridation process

31. The report takes account of the Code of Practice on fluoridation although it notes that this now needs updating. As far as the process is concerned, the report points out that many chemicals are used widely in the water industry, for example sulphuric acid, phosphoric acid, quick lime. Such chemicals present similar process problems to those associated with fluoride. These process problems include special requirements for handling and storage and high levels of reliability and accuracy in dosing and monitoring. The levels of technology are such that the risks of overdosing fluoride should be negligible if the installation is operated and maintained according to established guidelines. There are a number of precautions that can be taken against the accidental spillage or leakage of fluoridation chemicals, and to ensure the safety and protect the health of staff.

32. At a concentration of 1mg/l fluoride is completely soluble and remains constant throughout the distribution system. The taste, colour and odour of the water are not affected.

### Cost Benefits

33. The University of York Health Economics Consortium reported in 1998 on the costs and benefits of water fluoridation. It concluded :

studies comparing the cost-effectiveness of water fluoridation and other strategies for reducing caries carried out in many countries always conclude that water fluoridation is the most cost effective approach; calculating the costs of fluoridation is straightforward; calculating the benefits is less so but using population projections and knowledge of the underlying oral status it is possible to calculate the numbers of decayed teeth, fillings and extractions that will be prevented for children born after fluoridation. This calculation would, however, underestimate the benefits by excluding adults and children born before fluoridation; in areas where the average number of decayed, missing and filled teeth for 5 year olds is 2 or more and where the local treatment works serve populations of at least 200,000 people, the benefits of water fluoridation are likely to be significantly greater than the costs. Such areas include most or all of Wales, Scotland and parts of England. Even in areas where the costs and benefits are similar, or where the costs exceed the benefits, water fluoridation may be the most cost effective way to reduce caries.

Local studies comparing the costs and benefits can confirm these conclusions.

34. To give an indication of current expenditure on primary dental services dental treatment, the cost of the General Dental Service for adults in

2000/2001 is £60.8m, of which £24.6m is paid by patients. The cost of services to children is an additional £24.5m. In addition NHS Trusts in Wales reported expenditure of £17.2 million on dental specialities and a further £8.7 million on dental paediatric community services in 1999-2000.

### **Health restructuring**

35. The Water Industry Act 1991 provides for Health Authorities to request a water undertaker to increase the fluoride content of the water supplied by the undertaker. Before making or withdrawing such a request health authorities must give due notice to the local population and consult the relevant local authority or authorities. Restructuring of the health service, as announced on 15 November will result in the abolition of health authorities in March 2003. From then, these powers will be exercisable by the National Assembly for Wales either directly or through delegation to Local Health Boards.

36. In my announcement on 15 November, I made clear that public health capacity will be strengthened in Wales. I said that

*"At Assembly level this will be achieved under the leadership of the Chief Medical Officer, and thereafter NHS public health services will be organised on an all-Wales basis, located within an NHS Trust but with accountability to the Chief Medical Officer. Responsibility for the health of the population and for meeting statutory and operational requirements will be at the local health board level."*

37. This new structure would permit progress to be made in the further work needed at a national level to establish an all-Wales fluoridation programme with Local Health Boards closely involved in the plans and the consultation arrangements. The benefit of an all-Wales programme would lie in targeting the worst areas of dental ill-health first in order to maximise benefits and tackle the worst cases of disadvantage.

38. A number of issues would, however, need to be tackled, specifically

- the issue of statutory powers to require fluoridation if the water industry maintains its current position;
- the updating and implementation of a revised technical code of practice;
- the provision of indemnities to water undertakers in respect of fluoridation schemes.

### **Competition in the Water Industry**

39. Earlier this year central Government announced its proposals for boosting opportunities for competition in the water industry. A consultation paper giving further details of its proposals is awaited. Further consideration will need to be given to the possible impacts of competition and of 'common carriage' (the shared use of supply pipes and other infrastructure of an existing water supplier by a third party to enable the third party to provide water services in the supplier's area) on any fluoridation scheme.

## **Further Research**

40. In the light of the York review the Department of Health has asked the Medical Research Council to consider what further research might be required to improve the evidence base in the area of fluoride and health. The working group is likely to report early next year.

## **Environmental Impact**

41. As indicated in the previous paper to the Committee, further work is needed on the impact on fresh waters.

## **Conclusion**

42. In view of the poor dental health in Wales, the introduction of water fluoridation has the potential to deliver significant health gain and address health inequalities.

43. The recent study by Hyder Consulting, commissioned by the All Wales Fluoridation Steering Group of the Welsh Health Authorities suggests that a scheme or schemes in Wales are practicable and technically feasible. Cost benefit work suggests Wales would benefit significantly. Discussions with the water industry and further studies would be needed to take this work forward.

44. The structural changes to the NHS announced recently will facilitate an all-Wales approach to fluoridation in consultation with Local Health Boards.

## **Financial implications**

45. There are currently no plans to introduce fluoridation in Wales and no financial reserves within the provision of the Health and Social Services Main Expenditure Group for fluoridation. There are no additional financial implications for the Assembly as a result of this paper. Any decision to take forward further work on the possible introduction of fluoridation is subject to a successful bid through the annual budget planning round.

## **Compliance**

46. The Health and Social Services Committee can consider the issues in the paper under Standing Order 9.7.

## **References**

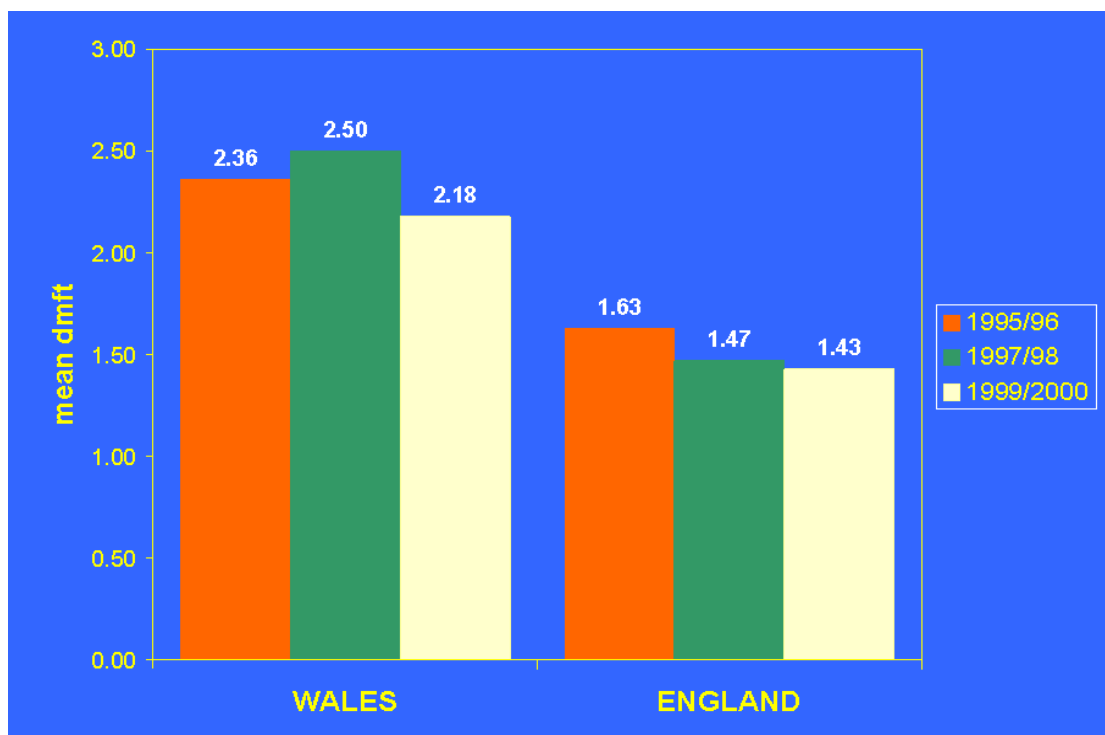
1. World Health Organisation 1958. Expert Committee on Fluoridation.
2. World Health Organisation. Fluorides and Oral Health: Report of a WHO Expert Committee on Oral Health Status and Fluoride Use. WHO Technical Report, Series 1994; 846.
3. British Association for the Study of Community Dentistry carries out childhood epidemiology programme targeted at different age groups each year, five-year-old children are surveyed in alternate years and 12 and 14 year-olds are surveyed every fourth year.

4. This paper has been drafted drawing on information contained in a Hyder Consulting "Water Fluoridation Technical Feasibility Study for Wales and Hereford" commissioned by Welsh Health Authorities and "Water Fluoridation and Public Health" published by Dental Health Foundation in Association with the Faculty of Public Health Medicine, The Royal College of Physicians of Ireland.

**Annex A**

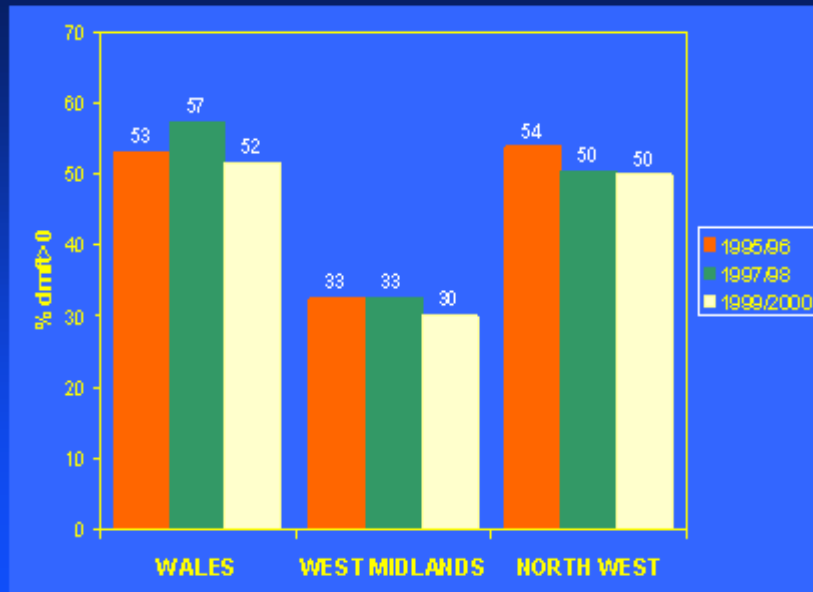
**Graph 1**

**Mean dmft survey of five year olds, Wales compared with England**



**Graph 2**

### Comparison of dmft>0 in Wales, the West Midlands and the North West of England

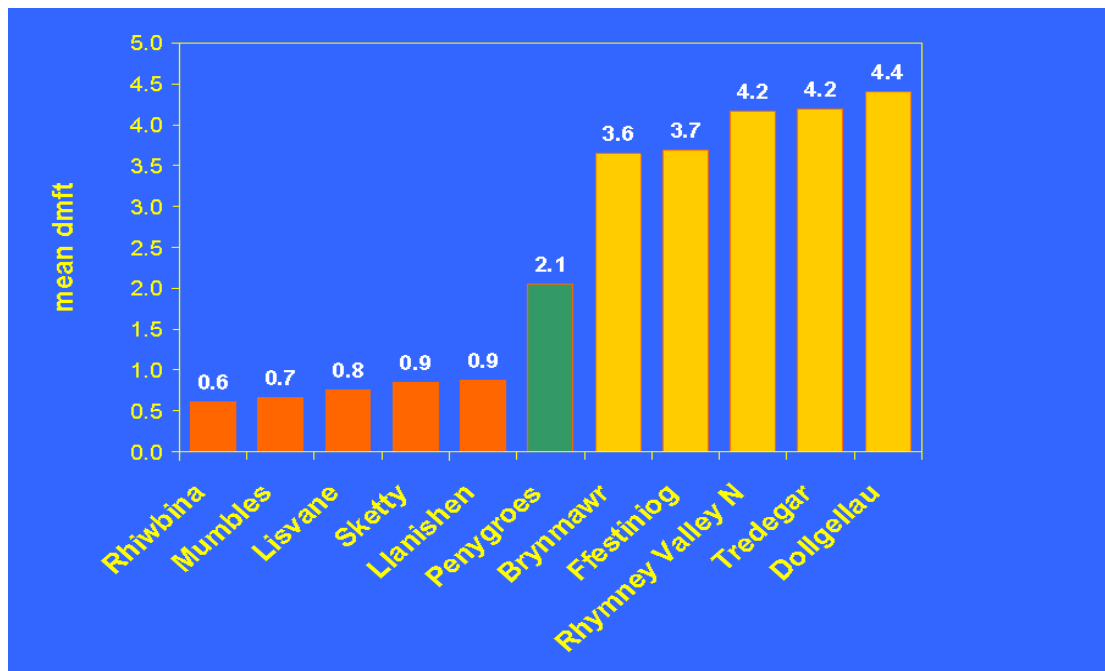


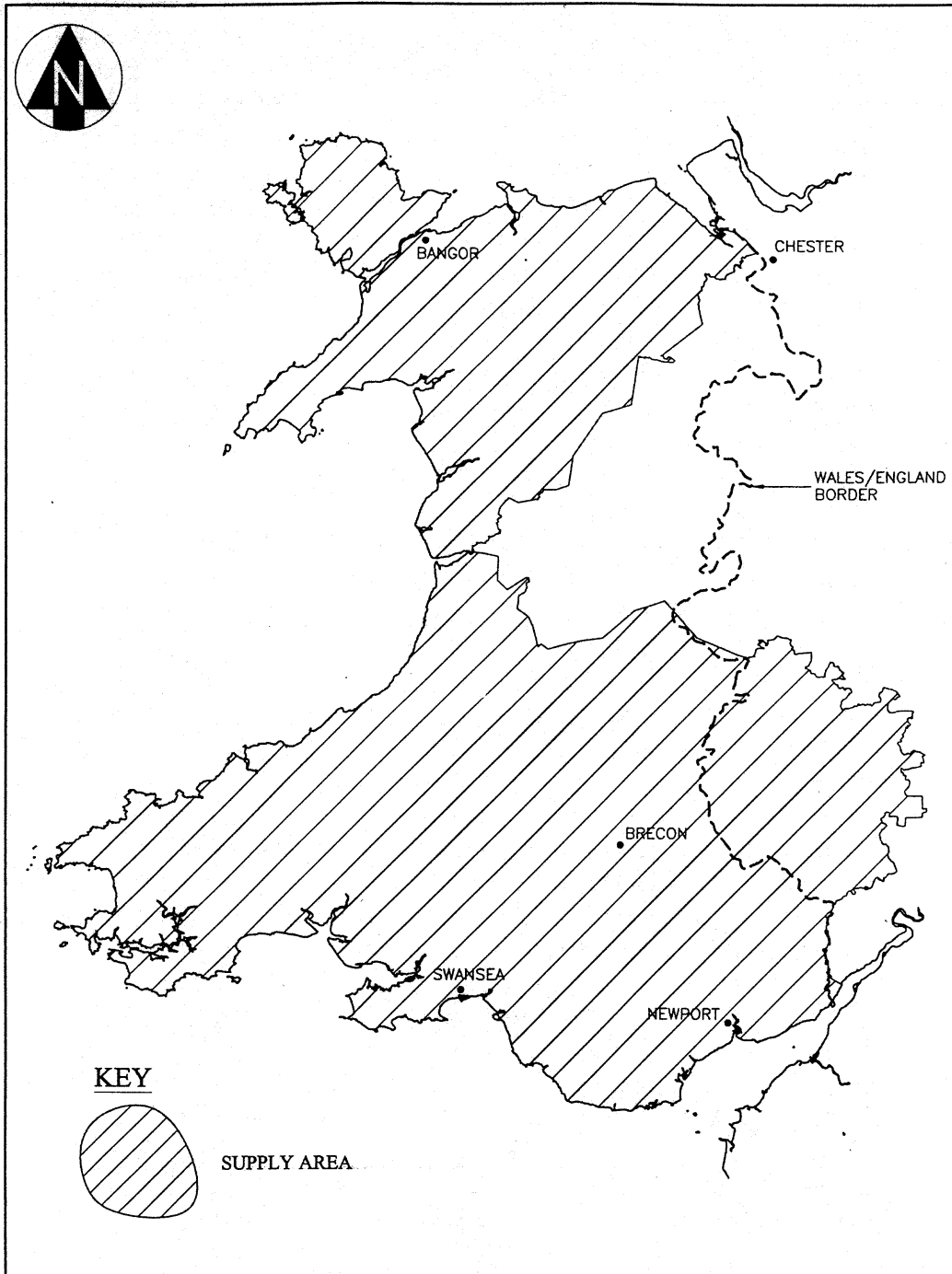
1

### Graph 3

#### Survey of five year olds 1999/2000 Mean dmft Dental Planning areas

Mean dmft 5 year olds 1999/2000, 5 best dpas, median dpa, 5 worst dpas





						Project		HYDER CONSULTING LIMITED 70 Redcliff Street Bristol BS1 6AL Tel: +44 (0)117 988 1881 Fax: +44 (0)117 988 1661		
						WATER FLOURIDATION TECHNICAL FEASIBILITY STUDY FOR WALES AND HEREFORD		Hyder Consulting		
A	FIRST ISSUE	PS	PAC	EXP	JAN 98	Title				
Issue	Description	Auth.	Dist.	Appd.	Date	DWR CYMRU WELSH WATER SUPPLY AREA				
Scale (A4)		Datum				Project Code		Drawing No.		Issue
N.T.S		LOCAL				WX00569		5.1		A





**2011/2012 Dental Survey Protocol  
Epidemiological survey of school year 1  
(5-year-old) children in Wales**

**Dental Public Health Team**

**Authors:** N Monaghan

**Date:** 27 June 2011

**Version:** 0c

**Publication/ Distribution:** (Delete as applicable)

- Public Health Wales (Intranet)

**Review Date:** N/A

**Purpose and Summary of Document:**

This protocol supports the planning and delivery of the NHS co-ordinated survey of school year 1 children in Wales. It outlines processes and standards to ensure that data collected is of high quality and is comparable across Wales, more widely across the UK and over time.

**Work Plan reference:**

<b>DENTAL SURVEY OF SCHOOL YEAR 1 CHILDREN IN WALES 2011/2012</b>
---

<b>Welsh Oral Health Information Unit</b>	Professor I Chestnutt	Dental School, Cardiff University, Heath Park, Cardiff	029 2074 4090
	Mrs M Morgan Lecturer in Dental Public Health	Dental School, Cardiff University, Heath Park, Cardiff	029 2074 4612
<b>All Wales Co-ordinator (also District Contact Cardiff)</b>	Mr N Monaghan Consultant in Public Health	NPWS Wales Temple of Peace & Health Cathays Park, Cardiff CF10 3NW	029 2040 2497
<b>Regional Contacts</b>	Mr Hugh Bennett	NPWS Wales Public Health Wales Oldway Centre 36 Orchard Street, Swansea SA1 5AQ	01792 607329
<b>Benchmark Examiner</b>	Julie Jobbins	Clytha Clinic, 27 Clytha Park Road, Newport, Gwent NP20 4PA	01633 435990
	Dr S Sandham DDPH	Clinical Director for NWCDSD/Director of Dental Public Health, Dental Administration Office, Royal Alexandra Hospital, Marine Drive, Rhyl LL18 3AS	01745 443104
<b>Local Organiser</b>	Mr W Challacombe Senior Dental Officer	Dental Department, Pontardawe Healthcare Centre, Alloy Industrial Estate, Pantardawe, Swansea, SA8 4US	01792 860819
	Ros Lewis	Senior Dental Officer, Dental Dept, Hollies Health Centre, Swan Street, Merthyr Tydfil, CF47 8ET	01685 359900 or 07968 300546
	Cara Lemon	Dental, Hywel Dda Health Board, Merlins Court, Winch Lane, Haverfordwest, Pembrokeshire SA61 1SB	01437-771220
	Mr J Clewett	Dr John Clewett Deputy Clinical Director North Wales Community Dental Service Dental Administration Royal Alexandra Hospital Marine Drive RHYL LL18 3AS	01745 443206

## **DENTAL SURVEY OF SCHOOL YEAR 1 CHILDREN IN WALES 2011/2012**

### **1 OBJECTIVES**

- 1.1 To record data for All Wales Common Minimum Data Set, 2012, from a sample of Year 1 (approximately School Year 1) children in areas in Wales in the school terms, Winter 2011/2012 and Spring 2012.
- 1.2 To obtain valid estimates of caries prevalence of Year 1 children which will be comparable within areas of Wales and with other areas of the UK where similar surveys are being carried out.
- 1.3 To evaluate new consent arrangements in line with newly issued guidance from the Welsh Assembly.

### **2 BACKGROUND**

- 2.1 The survey will follow BASCD guidelines given in "Guidelines for prevalence studies of dental caries" published in Community Dental Health 1.1 (1984) 55-56 and subsequently modified in Community Dental Health Volume 14 Supplement No. 1 March 1997 6-9.
- 2.2 Within Wales the survey findings will be used to aid procurement and provision of dental services.
- 2.3 The study will be the responsibility of Local Health Boards in Wales, and undertaken through their community dental service, with the channel of communication being through the Consultant in Dental Public Health and Local Organisers.
- 2.4 All-Wales co-ordination will be by the Public Health Wales, through Mr Nigel Monaghan. Data cleaning and analysis will be undertaken by the Welsh Oral Health Information Unit, through Mrs Maria Morgan.
- 2.5 Comparability will be achieved by examiners being trained and calibrated to the Wales benchmark examiner, Dr J Jobbins.

### **3 SAMPLING**

- 3.1 Estimated school year populations are required by local organisers in August/September for sampling. Accurate school year populations are needed for analysis of weighted means. Local Organisers will obtain accurate school year population figures in December to use in data analysis. These will be forwarded to the Welsh Oral Health Information Unit.
- 3.2 The sample will be randomly selected. The aim will be to randomly select 70 subjects from each Dental Planning so that, after allowing for absentees, refusals etc., at least 50 subjects should be examined in each Dental Planning Area. There will be no substitution for sampled children who cannot be examined.
- 3.3 Where Dental Planning Areas contain less than 70 children in the 5-yr-old group, all children will be examined. Detailed guidance on how to sample has been prepared and is attached as an appendix to this protocol.
- 3.4 Local organisers should use the method in the guidance to calculate sample size and randomly select schools. They should forward a copy of the completed paperwork to the Regional Contact for checking prior to data collection.
- 3.5 Only one school year will be sampled. The sampling frame will be School Year 1 (the school year in which the 6th birthday is achieved, the “rising sixes”).

### **4 CONSENT**

- 4.1 The survey for 2011/8 will use written positive parental consent. In an attempt to improve response rate for this survey there will be 2 separate mailings of the consent form. The first mailing of the consent form will be of the form printed on white paper. The second mailing of the consent form will be of the form printed on coloured paper.
- 4.2 For positive consent of parents access to school lists will be required. From

these lists an appropriate sample of children should be selected. Letters should be sent to the parents notifying them of the forthcoming survey, providing them with sufficient information to permit them to follow up any questions they may have and to provide consent. A sample letter is included at Appendix 1. The letter should include the planned date of examination and be sent enclosing an envelope addressed to the appropriate contact in the school. Only those children whose parents respond to the letter by completing a consent form should be examined.

4.3 It is possible that some schools will not co-operate with this process, for example by refusing to provide information to allow a random sample to be drawn. In these circumstances details of the schools and reasons given for not co-operating should be collected and provided to the Welsh Oral Health Information Unit.

4.4 The consent process within the school setting relies upon the Education Reform Act 1996 s 520 (2) which means any parental refusal notified must be respected. In addition parents are not consenting to coercion of children to co-operate. If either the parent refuses or the child refuses to co-operate then the child will not be examined.

## **5 EXAMINERS AND RECORDERS**

5.1 The number of examiners will be kept to a minimum as recommended in Community Dental Health, Volume 14 Supplement No. 1 March 1997, 18-29.

5.2 Each examiner will be accompanied by a recorder supplied by the provider Trust.

## **6 TRAINING AND STANDARDISATION**

- 6.1 All examiners and recorders will attend a training and calibration exercise to be based at the Marriott Hotel Swansea from the 12<sup>th</sup> – 14th October 2011. Examining teams need to bring their own approved light source, extension lead, computer, latex-free gloves and reclining chair to the calibration.
- 6.2 The cost of the training and calibration exercise will be borne by the Welsh Government.
- 6.3 For information purposes additional information on the examination aspects of the training and calibration exercise is included at Appendix 5.
- 6.4 Prior to the training and calibration exercise it is expected that all recorders will be trained in use of computers equivalent to the European Computer Driving Licence (ECDL) module 2, and following that training trained in data entry using Dental SurveyPlus 2.

## **7 THE EXAMINATIONS**

- 7.1 The examinations will take place in schools.
- 7.2 Subjects will be prone with the examiner seated behind them.
- 7.3 The recorder will be seated comfortably in a position to hear clearly what is said by the examiner.

## **8 EQUIPMENT REQUIRED**

- 8.1 A purpose built light yielding 4000 lux at 1 metre (e.g. Daray) or a similar protected light source will be used for illumination. In the interests of comparability, fibre-optic light sources should not be used to transilluminate approximal surfaces.
- 8.2 Extension flex and plug adapter for use when necessary with the lamp.
- 8.3 Disposable paper roll for laying out instruments.
- 8.4 Spare recording charts, pencils, rubber and sharpener for use in case of

computer failure.

- 8.5 Portable microcomputer using Dental SurveyPlus 2 and appropriate extension and adapter leads and plugs.
- 8.6 Materials to ensure cross-infection control including containers for clean instruments, containers for dirty instruments, disinfectant spray/wipes, clean latex-free gloves, eye protection for subjects, clinical waste bags together with sufficient cotton wool buds/rolls etc. for each child.

## **9 EXAMINATION PRINCIPLES**

- 9.1 Diagnoses will be visual using a plane mouth mirror. A blunt ball-ended probe (CIPTN) with an end diameter of 0.5mm will be used as described below.
- 9.2 All necessary steps must be taken to prevent cross-infection. A fresh set of previously sterilised instruments will be used for each subject.

## **10 EXAMINATION PROCEDURE**

- 10.1 On commencing the session ensure that the Caps Lock is turned on. This will ensure a consistent approach for surfaces coded T.
- 10.2 The standard sequence to be used in examination and collecting data is:-
- (a) Collection of standard data related to the session (examiner code, unitary authority, dental planning area code, school code, school postcode, date of examination)
  - (b) Collection of any personal information (consent sheet colour, pupil number, date of birth, gender).
  - (c) Oral examination.
- 10.3 Teeth will be examined for caries in the following order:
- (a) Upper Left to Upper Right
  - (b) Lower Right to Lower Left
- 10.4 Surfaces will be examined in the following order:-

Distal, Occlusal, Mesial, Buccal, Lingual

- 10.5 Each tooth will be identified and each surface recorded according to the diagnostic criteria for caries.
- 10.5 Teeth must not be brushed but may be rinsed prior to examination. Debris or moisture may be removed from individual sites where visibility is obscured, with cotton wool. Compressed air will not be used.
- 10.6 X-rays will not be taken.
- 10.7 Presence or absence of sepsis in the mouth will be noted and coded.

## **11 SESSION INFORMATION**

- 11.1 Examiner code: each examiner has a code of 1 letter (which must be entered, must be used consistently during the survey. Carried forward from previous record.
- 11.2 Unitary Authority: pull-down menu. Carried forward from previous record.
- 11.3 Dental Planning Area (historical health authority codes will be used for 2011/8 up to 5 letters/numbers. Carried forward from previous record.
- 11.4 School code: an alphanumeric code will be identified for each school, e.g. AO1, BO2, etc. according to area (up to 4 numbers/letters – must be entered). Carried forward from previous record.
- 11.5 School postcode, Alphanumeric up to 7 characters, must be completed (use dummy characters AAAAAAA if postcode needs to be added later) For postcodes with 6 characters enter as AB1 2CD. Carried forward from previous record.
- 11.6 Date of examination: must be entered as DD/MM/YYYY. Carried forward from previous record.

## **12 PERSONAL INFORMATION**

- 12.1 (If paper-recording sheets are used Child's surname and first name. These details must not be entered into a computer).
- 12.2 Consent sheet colour. Enter white or colour as appropriate.
- 12.3 Pupil Number: numerical, up to 5 digits, must be specified (can be considered as a record number).



- 12.3 Date of birth: must be entered as 11/MM/YYYY.
- 12.4 Gender: either Male or Female (or if unable to tell visually Indeterminate).

## **13 CARIES AND ORAL SEPSIS CRITERIA**

The diagnosis of the condition of tooth surfaces will be visual and the ball-ended probe will be used only for the removal of debris.

The tooth should be identified by quadrant and letter, A to E (or E to A), followed immediately by the appropriate surface codes which should be entered on the appropriate space on the dental chart.

### **13.1 Surface Code 1 - arrested dentinal decay**

Surfaces are regarded as falling into this category if the trained examiner there is of the opinion that there is hard arrested caries into dentine.

### **13.2 Surface Code 2 - decayed**

Surfaces are recorded in this category if the trained examiner is of the opinion that there is a carious lesion into dentine.

### **13.3 Surface Code 3 - decay with pulpal involvement**

Surfaces are regarded as falling into this category if the trained examiner is of the opinion that there is a carious lesion that involves the pulp, necessitating an extraction or pulp treatment. The examiner will not distinguish between different possibilities for treatment, e.g. pulp therapy or extraction, and involvement of the pulp will be the sole criteria. Use this code for all surfaces when a root only is present.

### **13.4 Surface Code 4 - filled and decayed**

A surface that has a filling (13.5) and a carious lesion (13.2), whether or not the lesion(s) are in physical association with the restoration(s), will fall into this category unless the lesion is so extensive as to be classified as "decay with pulpal involvement". In the latter case the filling is ignored and the surface classified Code 3.

### **13.5 Surface Code 5 - filled with no decay**

Surfaces containing a satisfactory permanent restoration (excluding crowns and bridge abutments) of any material will be coded under this category (with the exception of obvious sealant restorations which are coded separately as N).

### 13.6 **Surface Code R - filled, needs replacing (not carious)**

A filled surface is regarded as falling into this category if, in the opinion of the examiner, it is chipped or cracked and need replacing, but there is no “caries into dentine” present on the same surface. Lesions or cavities containing a temporary dressing or cavities from which a restoration has been lost will be regarded as “filled needs replacing”, unless there is also evidence of caries into dentine in which case they will be coded in the appropriate category of ‘decayed’.

Note: Tooth surfaces should be separately identified. Where categories are to be combined later, code R surfaces are part of the “Filled” component as no new caries is evident. This is a change from some previous conventions such as the inclusion of “unsound” surfaces with decay in the OPCS National Adult Dental Health Surveys.

### 13.7 **Tooth Code 6 - tooth extracted due to caries**

Surfaces are regarded as missing if the tooth of which they were a part has been extracted because it was carious. Surfaces which are absent for any other reason are not included in this category.

Missing deciduous canines and deciduous molars must be included in this category. Missing deciduous incisors will not be counted and should be coded as permanent teeth unerupted (Code 8).

### 13.8 **Tooth Code 7 - Extracted for orthodontic reasons**

This Code will not be used for School Year 1 children. Missing deciduous teeth will be assumed to be missing due to caries or natural exfoliation and coded accordingly. (See 13.7).

### 13.9 **Tooth Code 8 - Unerupted**

This code normally applies to permanent teeth. For School Year 1 children it is used where deciduous incisors are missing (See 13.7), and absent first permanent molars which will be assumed unerupted.

#### 13.10 **Surface Code 9 - Excluded**

When the examiner is unable to form a judgement on the state of a surface e.g. because more than half of it is obscured by orthodontic bands, Code 9 should be used. This code should only be used when strictly necessary due to obscuring of the whole of a tooth surface. (Note: For analysis purposes code 9 is interpreted as sound).

#### 13.11 **Surface Code C - crowned/advanced restorative procedures**

This code is used for all surfaces which have been permanently crowned (including stainless steel crowns) or which have received permanent items of advanced restorative care in the form of a veneer or a restoration constituting a bridge abutment. This is irrespective of the materials employed or of the reasons leading to the placement of the crown/veneer/bridge. (Note missing teeth replaced by a bridge are coded 6, 8 or all surfaces T).

(Note: The number of teeth (and surfaces) coded \$, N and C should be separately identifiable. Decayed "d" comprises codes 1 + 2 + 3 + 4. Filled "f" comprises codes 5 + R + N.)

#### 13.12 **Surface Code T - trauma**

A surface will fall into this category if, in the opinion of the examiner, the tooth/surface has been subject to a traumatic blow and as a result:

- Is fractured so as to expose dentine
- or
- has been treated (excluding crown/advanced restorative procedures)
- or
- a surface is significantly discoloured.

If any tooth surface is both carious and traumatised it should be recorded under the appropriate category of decayed. Fillings inserted after an anterior root filling will be ignored and the surface coded as T.

### 13.13 **Surface Code 0 - present and “sound”**

A surface is regarded as “sound” if it shows no evidence of treatment or untreated clinical caries at the “caries into dentine” diagnostic threshold. The early stages of caries, as well as other similar conditions, are excluded. Surfaces with the following defects, in the absence of other positive criteria, should be coded as present and “sound”.

- white or chalky spots;
- discoloured or rough spots;
- stained pits or fissures in the enamel that are not associated with a carious lesion into dentine;
  
- dark, shiny, hard, pitted areas of enamel in a tooth showing signs of moderate to severe fluorosis.

All questionable lesions should be coded as “sound”.

### 13.14 **Sealed Surfaces**

The ball-ended probe will be used to assist in the detection of sealants. Care should be taken to differentiate sealed surfaces from those restored with tooth coloured filling materials used in prepared cavities which have defined margins and no evidence of fissure sealant (the latter are regarded as fillings and are coded 5, 4 or R). Sealant codes should only be used if the surface contains evidence of sealant (including cases with partial loss of sealant), is otherwise sound and does not also contain an amalgam or conventional tooth coloured filling. Sealant codes are \$ and N.

### 13.15 **Surface Code \$ - sealed surface, type unknown**

All occlusal, buccal and lingual surfaces containing, in the opinion of the examiner, some types of fissure sealant, but where no evidence of a defined cavity margin can be seen. (Note: this category will inevitably include both preventive and therapeutic sealants).

**13.16 Surface Code N - obvious sealant restoration**

All occlusal, buccal and lingual surfaces containing, in the opinion of the examiner, a sealant restoration where there is evidence of a defined cavity margin and a sealed unrestored fissure. (If doubt exists as to whether a preventive sealant or a sealant restoration is present the surface should be regarded as being preventively sealed - Code \$).

**13.17 Sepsis in the mouth**

Following examination of the mouth, if, in the opinion of the trained examiner, the presence of an acute abscess or sinus has been noted, code 'Yes' for Sepsis. If no abscess or sinus has been seen, code 'No'.

**14 DATA COLLECTION**

14.1 Data will normally be recorded at school on a portable microcomputer using Dental Survey Plus 2.

14.2 A Dental Survey Plus 2 format will be supplied by Mr N Monaghan and must be used for data collection and analysis. The Dental Survey Plus 2 format will be available in June 2011. The format should not be altered. If additional data is to be collected locally it should be collected separately.

14.3 A separate format for recording of refusals by local authorities, by schools and by pupils/parents will be supplied. These should be completed by local organisers (including completion of nil returns) and returned to the WOHIU with the epidemiology data file.

14.4 Examiners and Recorders will have paper charts for recording data in case of malfunction of the computer.

14.5 Diagnostic criteria will be coded:

Sound	= Code 0
Hard arrested decay	= Code 1
Decayed into dentine	= Code 2
Decayed into pulp	= Code 3
Filled and decayed	= Code 4
Filled with no decay	= Code 5
Filled needs replacing (not carious)	= Code R
Extracted due to caries	= Code 6

<i>This code will not be used</i>	= Code 7
Unerupted	= Code 8
Tooth excluded	= Code 9
Crown	= Code C
Trauma	= Code T
Sealed surface, type unknown	= Code \$
Obvious sealant restoration	= Code N

## 15 QUESTIONNAIRE DATA

- 15.1 Non-clinical data required for the Wales Common Minimum Dental Data Set will be collected by a questionnaire sent to the parents of the sample children. The questionnaire contains questions used in the National Child Dental Health Surveys. The questionnaires are appended to this protocol. These should be copied for use locally.
- 15.2 The Betsi Cadwaladr University Local Health Board use a different questionnaire specific to their needs.
- 15.3 Examiners are strongly encouraged to enter answers directly onto the computer when examining children.
- 15.4 As positive consent is to be used the consent form should be sent to the parents attached to the questionnaire.

## 16 USE OF QUESTIONNAIRE

- 16.1 The questionnaire and consent form can be distributed to parents through the school. An envelope addressed to the appropriate school contact should be provided so that completed questionnaires and consent forms can be returned by parents.
- 16.2 Questionnaire data will be entered into the Dental SurveyPlus 2 format locally.

## 17 DATA CLEANING

- 17.1 The recent improvements in data quality across Wales can be attributed to an integrated team approach to quality assurance. This team consists of all data fieldworkers (i.e. dentists and dental nurses), the five local epidemiology co-ordinators, the WOHIU and the all Wales dental epidemiology co-ordinator.

To ensure continued data quality the **data must undergo the following three way data handling process:**

- Those collecting the data should adhere to the guidelines within this protocol and those distributed at the annual training and calibration exercise.
- The data must then be further processed by the Local Organiser to ensure consistency of approach across specific regions.

The data is processed once more by the WOHIU to ensure consistency of approach across the Principality.

- 17.2 Examiners and Local Organisers will check that dates of birth are in the range 5.00-6.99 years (note children should only be beyond this range if they have skipped a school year or been held back one year). Examiners and Local Organisers will also check for postcodes and insert them when they are missing.

12 Postcodes per day can also be found by using the following internet site: [www.royalmail.com](http://www.royalmail.com) by clicking "Find a Postcode".

## **18 DATA PROCESSING**

- 18.1 Local Organisers will assemble the clinical and questionnaire data in a single data file for each Unitary Authority and prepare summary data for each Dental Planning Area.

- 18.2 In order to ensure a common method is used, data for the Welsh Common Minimum Dental Data Set will be processed by the Welsh Oral Health Information Unit. Local Organisers must send a copy of each Unitary Authority data file, on disk to the Welsh Oral Health Information Unit at the Dental School, Cardiff. Maria Morgan can be contacted at the unit via telephone on 029 2074 4612. This does not stop Local Organisers carrying out their own analyses of their copy of the data.

- 18.3 Results will be prepared for Unitary Authorities by the Welsh Oral Health Information Unit in accordance with the headings of Tables 4 to 8 inclusive of the Common Minimum Data Set 2012. A copy of the results will be returned to each Local Organiser and Consultant in Dental Public Health.

## 19 BASCD DATA

19.1 A BASCD summary will be prepared for Mr Monaghan by the Welsh Oral Health Information Unit using the standard reporting form distributed by the Dental Health Services Research Unit, Dundee. Dental Planning Area data will be appropriately weighted to give the UA area data.

19.2 BASCD data will be co-ordinated by the All Wales Co-ordinator, working with the Welsh Oral Health Information Unit, for onward transmission to Dundee by 31 July 2012. Data will be forwarded at District and Unitary Authority levels. It is expected to cover:

### **Name of Unitary Authority**

Start and finish dates for examinations

Total population of age group

Total number of schools

Number of schools visited

Sample drawn

Number of children examined

Mean age in years and standard deviation

Mean number of dt, standard deviation and 95% confidence interval

Mean number of mt, standard deviation and 95% confidence interval

Mean number of ft, standard deviation and 95% confidence interval

Mean number of dmft teeth, standard deviation and 95% confidence interval

Number and percentage of children with caries experience,

(dmf > 0)

Number and percentage of children with current dentinal decay.

(d > 0)

For dt > 0, mean number of dt and standard deviation

For dmft > 0, mean number of dmft and standard deviation

19.3 All means and standard deviations should be recorded to two decimal places.



## **20 TIMETABLE AND DEADLINES FOR RESULTS**

- 20.1 Local Organisers should send their cleaned data file to the Welsh Oral Health Information Unit by 30 April 2012.
- 20.2 The Welsh Oral Health Information Unit will prepare data for Tables 4 to 8 of the Common Minimum Dental Data Set, by Dental Planning Area, for Public Health Wales by 31 December 2012.

## APPENDICES

- 1) Positive Consent Letter to Parents
- 2) All – Wales Questionnaire – English
- 3) All – Wales Questionnaire – Welsh
- 4) Sampling Guidance
- 5) Child Protection Resources

**Consent Letter**

Address  
Address  
Address  
STD Telephone Number  
[Date Stamp Desirable]

Dear Parent/Guardian,

**Re (name of child).....**

A dental inspection for year 1 pupils at your child's school has been arranged, commencing on *Day, NN of Month, Year*. This is part of a survey programme run in Wales on behalf of the National Assembly.

The inspection consists of a brief visual examination of the mouth using a sterile mirror and probe. No treatment will be carried out during this inspection. If a more detailed examination is indicated you will be informed and appropriate arrangements will be suggested.

The inspection process will allow us to plan the provision of dental services, to help ensure children have healthier teeth. We collect only the minimum of personal information (school postcode, gender, month and year of birth) with information on the state of children's teeth. We do not collect your child's name. Please help us by allowing and encouraging your child to participate and returning to us a completed questionnaire.

If you have any questions regarding the dental inspection please do not hesitate to contact me.

Please provide consent for your child to have their teeth examined using the form provided. Along with the form and questionnaire we have enclosed an addressed envelope. You can be reassured that we will only examine your child's teeth if they are happy for us to proceed on the day.

Thank you for your co-operation.

Yours sincerely,

**Name**

**Clinical Director/Senior Dental Officer/Community Dental Officer**

**Llythyr Traddodiadol i geisio Caniatâd Cadarnhaol**

Cyfeiriad  
 Cyfeiriad  
 Cyfeiriad  
 Rhif Ffôn STD  
 [Stamp Dyddiad yn Ddymunol]

Annwyl Rhiant / Gwarchodwr,

**Parthed (enw'r plentyn).....**

Trefnwyd archwiliadau deintyddol i ddisgyblion blwyddyn 1 yn ysgol eich plentyn. Byddant yn dechrau ar *Ddydd, NN Mis, Blwyddyn*. Mae hyn yn rhan o raglen arolygu a gynhelir yng Nghymru ar ran y Cynulliad Cenedlaethol.

Bydd ceg eich plentyn yn cael ei archwilio'n gyflym gan ddefnyddio drych a mewnwilydd di-haint. Ni chaiff y plentyn unrhyw driniaeth yn ystod yr archwiliad hwn. Os bydd arwyddion bod angen archwiliad mwy manwl fe gewch eich hysbysu a chewch awgrymiadau ar gyfer trefniadau addas.

Bydd y broses archwilio'n ein caniatáu i gynllunio'r ddarpariaeth gwasanaethau deintyddol, er mwyn sicrhau bod gan blant ddannedd iachach. Dim ond ychydig bach o wybodaeth bersonol rydym yn ei chasglu (cod post yr ysgol, rhyw, mis a blwyddyn geni) ynghyd â gwybodaeth am gyflwr dannedd y plant. Nid ydym yn casglu enw'ch plentyn. Rydym yn gofyn i chi ein helpu trwy ganiatáu i'ch plentyn gymryd rhan yn yr archwiliad a'i annog i wneud, a thrwy ddychwelyd holiadur wedi'i gwblhau.

Os oes gennych unrhyw gwestiynau ynghylch yr archwiliad deintyddol, mae croeso i chi gysylltu â mi.

Os gwelwch yn dda, rhowch eich caniatâd i'ch plentyn gael archwilio'i ddannedd trwy ddefnyddio'r ffurflen amgaeedig. Ynghyd â'r ffurflen a'r holiadur rydym wedi cynnwys amlen â chyfeiriad. Gellwch fod yn hollol sicr na fyddwn ond yn archwilio dannedd eich plentyn os yw'n fodlon i ni wneud hynny ar y diwrnod.

Diolch am eich cydweithrediad.

Yn gywir,

**Enw**  
**Cyfarwyddwr Clinigol/Uwch Swyddog Deintyddol/Swyddog Deintyddol**  
**Cymunedol**

### Dental Survey Inspection Consent Form

I .....do/do not  
*(name of parent)* *(delete as appropriate)*

give my consent to the participation of

.....  
*(name of child)*

in the All Wales Dental Survey of Year 1 pupils 2011/12

Signed .....

**Ffurflen Caniatâd ar gyfer Archwiliad  
Arolwg Deintyddol**

**Rwyf i / Nid wyf i .....**  
**(dilëir fel bo'n briodol) (enw'r rhiant)**

**yn caniatáu i**

.....  
**(enw'r plentyn)**

**gymryd rhan yn yr Arolwg Deintyddol Gymru gyfan o ddisgyblion  
Blwyddyn 1 2011/12**

**Llofnodwyd**

**CONFIDENTIAL****ALL-WALES DENTAL STUDY OF SCHOOL YEAR 1 CHILDREN 2011/2012**

NAME

SCHOOL

**Please tick the boxes below to give your answer ✓**

Please send the completed questionnaire and consent form back to school in the envelope provided.

1. In the last 12 months has your child had toothache (other than teething problems) **No**  **go to 8**  
**Yes**
2. If your child did have pain did they also have: **Tick all that apply**  
**Swelling** of the face or in the mouth?   
A high **temperature**
3. From whom did you seek help for toothache? **Tick one or more**  
**No-one**  **go to 8**  
**Doctor**   
**Dentist**   
**Pharmacist**   
**Other**

**Please specify for other.....**

4. On the day you first saw the doctor/dentist/pharmacist/other person what immediate treatment/advice was provided for the dental pain?

**Tick all that apply**

- Painkillers**   
**Antibiotics**   
**Extraction of tooth/teeth**   
**Filling(s)**   
**Other**

**Please specify for other.....**

5. If extraction or filling was part of the treatment **No**   
was this done under general anaesthetic? **Yes**

6. How was it between your first visit to the dentist and the visit when fillings were done or teeth extracted?

*Please tick one answer*

- Did not take to dentist**
- Same day**
- 1 day**
- 2-3 days**
- 4-7 days**
- More than 1 week**

7. When are your child's teeth brushed?

*Please tick all that apply*

- Does not have teeth brushed**
- Morning at home**
- Morning at school**
- Afternoon at school**
- Evening at home**
- Other**

*Please specify for other.....*

8. So far we have asked questions about your child. We'd also like to know a little about you, the parents or guardians. Would you please answer the following question about both the parents or guardians of the child, if they live in the household. If only one parent or guardian lives in the household, just answer for that parent

In general, do you go to the dentist for:

Mother/female guardian      Father/male guardian

Tick one

Tick one

A **regular** check up



An **occasional** check up



Or only when you are having **trouble** with your teeth?



End

Are there any questions you meant to go back to?

Please send this questionnaire with the consent form in the envelope provided?

Thank you



**CYFRINACHOL****ASTUDIAETH CYMRU GYFAN O DDANNEDD PLANT 5 OED 2011/2012**

ENW

YSGOL

**Ticiwch y blychau i ddangos eich ateb ü ✓**

A wnewch chi anfon y ffurflen wedi'i llenwi i'r ysgol yn yr amlen a ddarperir i chi.

1. In the last 12 months has your child had toothache (other than teething problems) **No**  **go to 8**  
**Yes**
2. If your child did have pain did they also have Swelling of the face or in the mouth? **No**   
**Yes**
3. From whom did you seek help for toothache? **Tick one or more**  
**No-one**  **go to 8**  
**Doctor**   
**Dentist**   
**Pharmacist**   
**Other**

**Please specify for other.....**

4. On the day you first saw the doctor/dentist/pharmacist/other person what immediate treatment/advice was provided for the dental pain?

**Tick all that apply**

- Painkillers**   
**Antibiotics**   
**Extraction of tooth/teeth**   
**Filling(s)**   
**Other**

**Please specify for other.....**

5. If extraction or filling was part of the treatment was this done under general anaesthetic? **No**   
**Yes**

6. How was it between your first visit to the dentist and the visit when fillings were done or teeth extracted? **Please tick one answer**

- Did not take to dentist**
- Same day**
- 1 day**
- 2-3 days**
- 4-7 days**
- More than 1 week**

7. Who brushes your child's teeth? **Please tick one answer**

- Does not have teeth brushed**
- Child brushes teeth**
- Parent brushes teeth**
- Child brushes, parent checks teeth are clean**
- Other**

**Please specify for other.....**

8. So far we have asked questions about your child. We'd also like to know a little about you, the parents or guardians. Would you please answer the following question about both the parents or guardians of the child, if they live in the household. If only one parent or guardian lives in the household, just answer for that parent

In general, do you go to the dentist for:

	Mother/female guardian	Father/male guardian
	Tick one	Tick one
A <b>regular</b> check up	<input type="checkbox"/>	<input type="checkbox"/>
An <b>occasional</b> check up	<input type="checkbox"/>	<input type="checkbox"/>
Or only when you are having <b>trouble</b> with your teeth?	<input type="checkbox"/>	<input type="checkbox"/>

End

A oes yna gwestiynau yr oeddech wedi bwriadu mynd yn ôl atyn nhw?

A wnewch chi anfon yr holiadur hwn i'r ysgol yn yr amlen a ddarperir i chi.

Diolch.

# **BASCD Co-ordinated Caries Prevalence Study, 2011/2012**

## **Guidance for Wales on Sampling Year 1 Pupils**

Children attending state funded primary schools (including grant maintained and church schools) in school year 1 will be surveyed. All dental planning areas contain at least one school. Schools are one of the environments in which children can be targeted for oral health initiatives. The sampling and reporting of the results of this years data will be on the school population of the dental planning area (i.e. sampling and analysis based on school postcode not home postcode).

### **Population**

The population under study is Children in school year 1.

### **Strata**

The first level strata for sampling are dental planning areas.

The second level strata for sampling are schools.

### **Information Required for Sampling**

A list of schools and the number of year 1 children expected in each school (August/September data).

### **Sample size per dental planning area**

70 children will be randomly selected from each dental planning area from an appropriate mix of small and large schools (see following page for method). In sampled schools all children in small schools will be examined and 1 in 2 children in large schools. However if there are less than 70 children in the dental planning area include all the children in the sample.

### **Minimum examination rates**

A minimum of 70 children will be examined in each dental planning area.

### **Data for planning samples and for weighting results**

The sample size will be calculated upon the expected school population (August/September data from schools). The weighting of results will not use

the expected school population but rather the actual school population (December data from schools).

**Completion of sampling tables**

For each dental planning area, complete Table 1 columns 1 to 4, allocating each school a number.

**Table 1: Schools in DPA**

(NAME) DPA						
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
DPA Schools	Schools with less than 30 children in Year One	Schools with 31 or more children in Year One	School's Number	Selected Yes/No	Selected Small Schools	Selected Large Schools (NB $\frac{1}{2}$ children)
First School Name	No. of children	No. of children	1			
-----	-----	-----	-----	-----	-----	-----
Last School Name	No. of children	No. of children	N			

Use the numbers in columns 1 and 2 of table 1 for a DPA to calculate the number of year 1 children in large schools, number of year 1 children in small schools and number of year 1 children in the DPA and enter these in Table 2 for the DPA.

**Table 2: Numbers and percentages of children in small and large schools**

(Name) DPA			
	No of children	% of Children	Minimum Sample
Small Schools			
Large Schools			
DPA Total			

Calculate the percentage of children in small and large schools and enter these in Table 2. Then multiply the percentage in small schools by 45 and divide by 100, round up any fraction to the next whole number and enter the result in the minimum sample box for small schools. Repeat this procedure to calculate the minimum sample for the larger schools.

Use the random number generator in Dental SurveyPlus 2 to generate a list of random numbers in the range of numbers allocated to the schools. Use these numbers to select small schools (tick in column 5) until there are enough pupils in those schools to match or exceed the minimum sample for small schools (put pupil numbers in column 6). Similarly select the large schools (tick in column 5) until there are enough pupils in those schools to match or exceed the minimum sample for large schools (put 50% of pupil numbers in column 7).

A worked example for Haverfordwest follows, and blank forms for photocopying follow the worked example.

**Worked Example for Haverfordwest****Table 1: Example schools in DPA**

Haverfordwest DPA						
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
DPA Schools	Schools with less than 30 children in Year One	Schools with 31 or more children in Year One	School's Number	Selected Yes/No	Selected Small Schools	Selected Large Schools (NB $\frac{1}{2}$ children)
Broad H	5		001			
Burton	12		002			
Fenton		39	003	Yes 1:2		
Hook	16		004			
Johnston		35	005	Yes 1:2		18
Llangwm	8		006			
Mary Immac	16		007			
Mt Airey		54	008	Yes 1:2		27
Penfordd	5		009	Yes	5	
Prend Inf		63	010			
Roch	18		011	Yes	18	
Rosemarket	3		012			
Spittal	16		013	Yes	16	
St Marks	24		014			
Wiston	20		015			
Ysgol Glan Cleddau	13		016			
Totals	156	191			= or >32	= or >39

**Table 2: Example numbers and percentages of children in small and large schools**

Haverfordwest DPA			
	No of children	% of Children	Minimum Sample
Small Schools	156	45%	32
Large Schools	191	55%	39
DPA Total	347	100%	70





Totals					= or >	= or >

**Table 2: Numbers and percentages of children in small and large schools**

..... DPA			
	No of children	% of Children	Minimum Sample
Small Schools			
Large Schools			
DPA Total			

# BASCD Co-ordinated Caries Prevalence Study, 2011/2012

## Child Protection Resources

## HOW TO MAKE A REFERRAL TO SOCIAL SERVICES

In any case where child abuse is suspected or apparent, the All Wales Child Protection Procedures **MUST** be followed (Pages 81-83)

### Q. When **MUST** a child protection referral be made?

A. As soon as you have significant child protection concerns about a child, a referral **MUST** be made to Social Services

### Q. Do I have to share my concerns with the parents/carers?

A. For a child protection referral obtaining parental consent is not obligatory, however it is good practice to share your concerns with the parents/carers unless to do so would put the child or you as a professional, at greater risk of harm.

### Q. Who is responsible for making the child protection referral?

A. The person who has the concerns **MUST** make the referral.

### Q. Can I access advice before making the child protection referral?

A. Yes, you can ask for advice, but **DO NOT** allow seeking advice to delay taking action to safeguard the child.

### Q. Should I make a child protection referral over the telephone?

A. Yes you should, but telephone referrals **MUST** be followed up in writing within 48 hours.

### Q. What if it is outside office hours?

A. Outside office hours, referrals should be made to the Emergency Duty Team, in exactly the same way, using the special contact number.

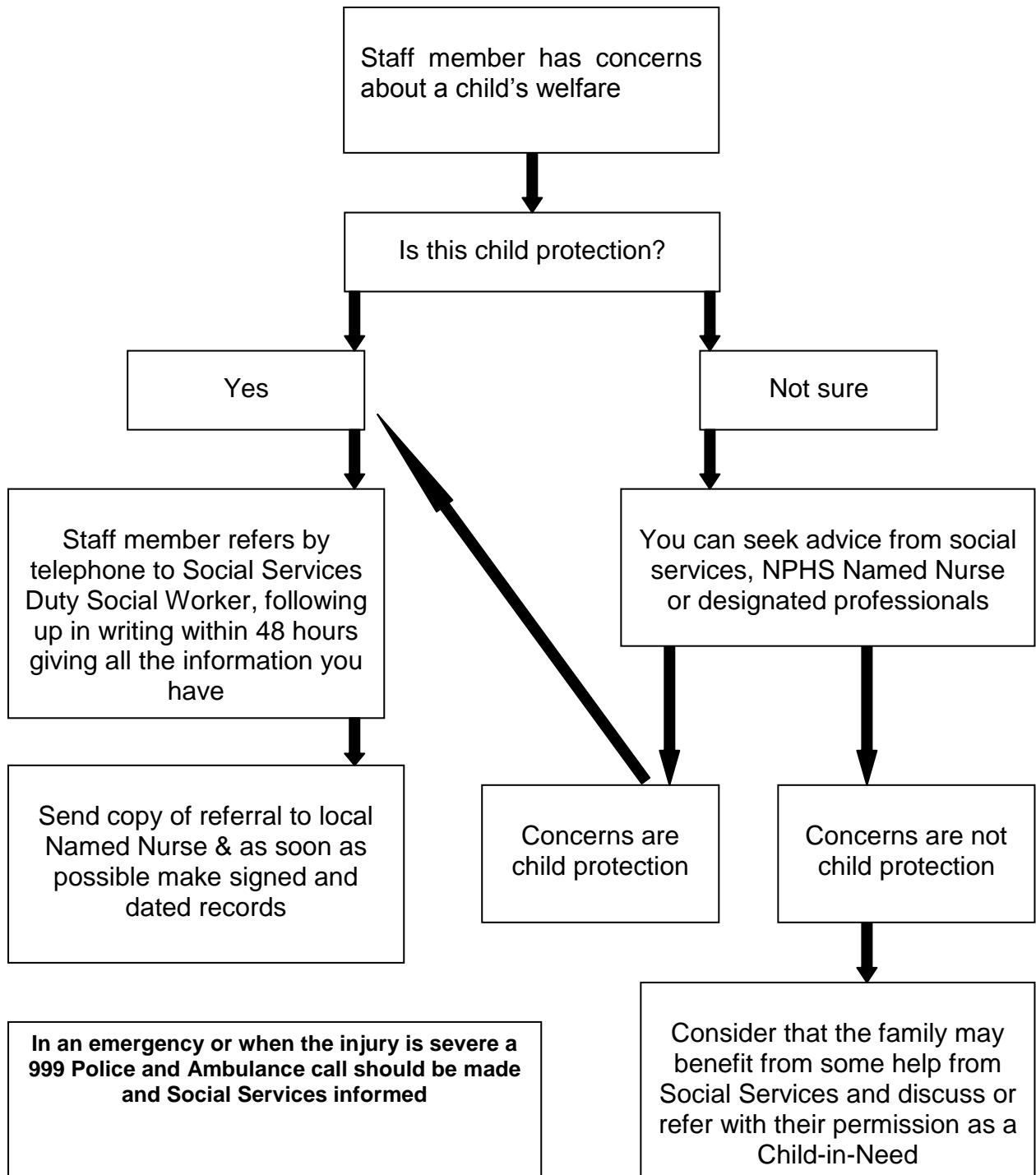
### Q. What about child in need referrals?

A. These may only need a written referral if there is no urgent need to be addressed and you should always have the consent of the parent.

They should give you feedback within 48 hours for child protection referrals, and 7 days for children in need referrals. However, if feedback is not received within these timescales it is good practice for the referrer to contact Social Services.

You may have limited knowledge of the family and feel unable to make a Child-in-Need referral. If this is the case you **Must** discuss your concerns with the Named Nurse.

# CHILD PROTECTION REFERRAL PATHWAY



**REMEMBER THE SAFETY OF THE CHILD IS PARAMOUNT – IF IN DOUBT SHARE YOUR CONCERNS WITHOUT DELAY**

Please refer to the All Wales Child Protection Procedures 2008 page 81-83

[www.awcpp.org.uk/9547.html?diablo.lang=eng](http://www.awcpp.org.uk/9547.html?diablo.lang=eng)

# 1.1 CONTACT TELEPHONE NUMBERS

**Kate McDonald Named Nurse Safeguarding Children**

**01352 803214**

\* EDT = Emergency Duty Team

NORTH WALES	MID AND WEST (DYFED POWYS)	MID AND WEST (SWANSEA)	SOUTH EAST WALES (BRO TAF)	SOUTH EAST WALES (GWENT)
<b>Designated Doctor</b>	<b>Designated Doctor</b> Dr Hywel Williams 02920 715081 (Powys)	<b>Designated Doctor</b>	<b>Designated Doctor</b> Dr Hywel Williams 02920 715081	<b>Designated Doctor</b> Dr Aideen Naughton 01873 732726
<b>Designated Nurse</b> Rachel Shaw 01352 803297	<b>Designated Nurse</b> Janet Evans 01267 225018	<b>Designated Nurse</b> Daphne Rose 01792 607536	<b>Designated Nurse</b> Caroline Jones 01443 824180	<b>Designated Nurse</b> Lin Slater 01495 332217
<b><u>Social Services</u></b>	<b><u>Social Services</u></b>	<b><u>Social Services</u></b>	<b><u>Social Services</u></b>	<b><u>Social Services</u></b>
<b>Flitshire</b>	<b>Carmarthenshire</b>	<b>Bridgend</b>	<b>Cardiff</b>	<b>Newport</b>
Day 01352 701000 EDT 0845 0533116	Day 01558 825485 EDT 01558 824283	Day 01656 642320 EDT 01443 849944	Day 02920 536400 EDT 02920 788570	Day 01633 656656
<b>Wrexham</b>	<b>Pembrokeshire</b>	<b>Swansea</b>	<b>Merthyr Tydfil</b>	<b>Caerphilly</b>
Day 01978 292039 EDT 0845 0533116	Day 01437 776325 EDT 08708 509508	Day 01792 635700 EDT 01792 775501	Day 01685 724506 EDT 01443 849944	Day 0808 1001727
<b>Conwy</b>	<b>Ceredigion</b>	<b>Neath Port Talbot</b>	<b>RCT</b>	<b>Blaenau Gwent</b>
Day 01492 575111 EDT 01492 515777	Day 01545 572616 EDT 0845 6015392	Day 01639 764523 EDT 01639 896525	<b>Rhondda</b> Day 01443 431513 EDT 01443 849944	Day 01495 315700
<b>Denbighshire</b>	<b>Powys</b>		<b>Taf Ely</b>	<b>Monmouthshire</b>
Day 01824 712900 EDT 0845 0533116	<i>Brecon</i> Day 01874 624298		Day 01443 486731 EDT 01443 849944	<b>Chepstow</b> Day 01291 635679
<b>Gwynedd</b>	<i>Ystradgynlais</i>		<b>Cynon Valley</b>	<b>Abergavenny</b>
Day 01758 704455 EDT 01286 675502	Day 01639 844595		Day 01685 888800 EDT 01443 849944	Day 01873 735908
<b>Ynys Mon</b>	<i>Welshpool</i>		<b>Vale of Glamorgan</b>	<b>Torfaen</b>
Day 01248 752733 EDT 01286 675502	Day 01938 552017		Day 01446 725202 EDT 02920 788570	Day (Customer Care) 01495 762200
	<i>Newtown</i>			<b>For ALL the above areas the EDT no is:</b> 0800 3284432
	<i>Llandrindod Wells</i>			
	Day 01597 827325			
	Powys ALL areas			
	EDT 0845 0544847			

## All Wales Named Nurses Contacts

### For All Public Health Wales Staff

#### Public Health Wales NHS Trust

Kate McDonald

Tel: 01352 803214

[kate.mcdonald@wales.nhs.uk](mailto:kate.mcdonald@wales.nhs.uk)

### For Staff Who Work In Health Boards ONLY

#### Cardiff & Vale University Health Board

Kathy Ellaway / Beverley Evans

Tel: 029 20 932628

[kathryn.ellaway@wales.nhs.uk](mailto:kathryn.ellaway@wales.nhs.uk)

[beverley.evans7@wales.nhs.uk](mailto:beverley.evans7@wales.nhs.uk)

#### Cwm Taf Health Board

Jane Randall

Tel: 01443 443763

[jane.randall@wales.nhs.uk](mailto:jane.randall@wales.nhs.uk)

#### Aneurin Bevan Health Board

Linda Brown

Tel: 01633 623623

[linda.brown3@wales.nhs.uk](mailto:linda.brown3@wales.nhs.uk)

#### Abertawe Bro Morgannwg Health Board

Kathryn Lewis

Tel: 01639 683164

[Kathryn.lewis@wales.nhs.uk](mailto:Kathryn.lewis@wales.nhs.uk)

#### Hywel Dda Health Board

Mrs Karen Toohey (Carmarthenshire)

Tel: 01267 227056

[Karen.toohey@wales.nhs.uk](mailto:Karen.toohey@wales.nhs.uk)

Mrs Ruth Harrison (Ceredigion)

Tel: 01970 635794

[ruth.harrison@wales.nhs.uk](mailto:ruth.harrison@wales.nhs.uk)

Mrs Julie Hughes (Pembrokeshire)

Tel: 01437 773851

[julie.hughes@wales.nhs.uk](mailto:julie.hughes@wales.nhs.uk)

#### Powys Teaching Health Board

Mrs Pauline Galluccio

Tel: 01686 617443

[pauline.galluccio@wales.nhs.uk](mailto:pauline.galluccio@wales.nhs.uk)

#### Betsi Cadwaladr University Health Board

Tel: 01978 725362

[michelle.denwood@wales.nhs.uk](mailto:michelle.denwood@wales.nhs.uk)