NHS Dental Epidemiology Programme for England

Report June 2010

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Introduction

This report summarises the activity undertaken by the North West Public Health Observatory (NWPHO) and The Dental Observatory (TDO) in the delivery of the NHS (England) Dental Epidemiology Programme.

Firstly it provides information on the development of the NHS (England) Dental Epidemiology Programme since its establishment in 2007, including the reasons for the establishment of the programme and the processes which have developed.

Secondly it provides an overview of the 5 year programme of dental epidemiology surveys which was established by Strategic Health Authority (SHA) Dental Public Health leads.

Finally, it gives a summary of the processes followed in each of the surveys undertaken, some of the methodological issues which have arisen, examples of outputs produced so far and learning points for future consideration.

Background

The reasons for oral health surveys

The regulatory framework for dentistry and oral health was reformed in 2006, placing new responsibilities on Primary Care Trusts (PCTs) to commission or secure dental services to meet local oral health needs. Having local oral health data is essential for PCTs to undertake oral health needs assessments, a crucial part of the world class commissioning process.

Additionally, SHAs and PCTs require epidemiological information in order to report on the health of their populations, and in those areas in receipt of fluoridated water there is a specific requirement to report on the health effects of water fluoridation under the provisions of the 2003 Water Act.

Oral health is an important indicator of the health of a population and in some areas oral health has been identified as a Local Area Agreement target. There is a need therefore for other partners in health such as Local Authorities and other community groups to have ready access to good quality comparative data on oral health.

For these reasons, regulations have been made under the NHS Act such that PCTs are required to undertake epidemiology surveys. This requirement is contained in the Dental Public Health regulations (Statutory Instruments 2006 No.185 - Appendix A) backed by accompanying Directions (Directions to Primary Care Trusts concerning the exercise of dental public health functions 2008 - Appendix B).

Previous programmes

Standardised and co-ordinated NHS epidemiology surveys of children's teeth have been undertaken nationally since 1985. As a result, the UK has one of the best oral health databases in the world. Data obtained from these local surveys, together with the centrally commissioned decennial national surveys of child and adult dental health, have been and continue to be used by the UK Department of Health and the NHS to set both national and local targets for health improvement, to target preventive resources to areas of highest need and to assist in workforce planning and research.

Operationally there was a loose agreement between the Department of Health in England (DH) and the British Association for the Study of Community Dentistry (BASCD) which had developed over a number of years and had delivered a national data set through surveys of the dental health of five, twelve and fourteen year old children.
BASCD had been responsible for setting standards, undertaking the training and calibration of examiners, arranging a network of regional survey coordinators and for arranging the collation and publication of the data through the University of Dundee.

Although this had worked well for a number of years, a number of difficulties had arisen between 2000 and 2006 which suggested that a change in direction was needed with regard to the overall organisation of the surveys. These can be summarised as follows:

- Lack of strategic direction for the programme.
- Difficulty in ensuring PCT compliance in all parts of the country.
- Lack of a national protocol in guiding survey methodology and minimum sampling size.
- Variable quality assurance with respect to the data collected.
- Problems in making the results available to a wider audience to inform policy and commissioning developments.
- Lack of integration with other health datasets.
- Shifting geographies of health care organisations leading to problems with comparability.

The survey of five year old children undertaken in 2005/06 had significant gaps in terms of PCT data. If this scenario had continued the value of the data at a local and national level would have been seriously compromised and thereby the data available for both local commissioning and for fluoride monitoring.

**A change in direction**

In order to address these issues a change of direction was proposed. Discussions took place between the Deputy Chief Dental Officer, the DH Public Health Division, SHA Dental Public Health leads representing Regional Directors of Public Health (RDsPH), the Director of Science & Strategy (NWPHO), the Director of The Dental Observatory and BASCD to consider improving and mainstreaming the national dental epidemiology programme in England.

It was agreed by the Association of Public Health Observatories (APHO) that the NWPHO would take the lead for dental health. The West Midlands PHO also takes the lead in relation to the collection of data for monitoring the health effects of fluoridation.

The Dental Observatory (TDO) in the North West is an NHS body funded by North West PCTs to support them in the delivery, analysis and presentation of the NHS dental epidemiology programme. The NWPHO and TDO had been working together to integrate the North West dental data within the NWPHO datasets and it was felt that this experience could be used to support a more robust national programme.

One of the key features of the reforms of NHS dental services was to mainstream dentistry and oral health within wider NHS and DH policy. It was agreed therefore that there should be much closer alignment with the PHOs in terms of the collection, collation and dissemination of oral health data which would place the data firmly within the Public Health Information Strategy.

Under the new arrangements, the SHAs, in association with the DH, have direct responsibility for the NHS surveys, directing PCTs to undertake the agreed dental survey activity each year. Through SHA performance management arrangements, PCTs are accountable for the delivery of this function in line with regulations and directions. These directions instruct PCTs in terms of what they need to do to comply with the regulations, including undertaking oral health surveys in accordance with the NHS (England) dental epidemiology programme and timetable.
The first stage in this new process was to develop a five year programme and timetable of surveys and outputs to follow the agreed 2007/08 survey of five year olds, which would give direction and stability. The NWPHO and TDO were commissioned to coordinate this and through a stakeholder workshop followed by final sign off by SHA Dental Public Health Leads, the following programme was established.

Table 1: Timetable of surveys and outputs

<table>
<thead>
<tr>
<th>Academic year</th>
<th>Proposed plan</th>
<th>Reasons</th>
<th>Other surveys in England</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007/08</td>
<td>5yr olds</td>
<td>Links with Wales Y1 and Scotland P1. Supports first SHA water fluoridation reports</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys</td>
</tr>
<tr>
<td>2008/09</td>
<td>12 yr olds caries, ortho and perceptions of enamel mottling</td>
<td>End of transitional commissioning – richer data required. Maximising yield from existing data sources Wales Y7 and Scotland P7</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys</td>
</tr>
<tr>
<td>2009/10</td>
<td>Collaborative work with ADHS eg, local ADH surveys</td>
<td>Links with ADHS Wales – planning survey of adults Scotland P1</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys, <strong>Decennial ADHS</strong></td>
</tr>
<tr>
<td>2010/11</td>
<td>SHA defined activities Advice and some core protocols to be provided by NWPHO/TDO</td>
<td>Links with WHO international comparison. Supports SHA water fluoridation reports – measurement of fluorosis Scotland P7</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys</td>
</tr>
<tr>
<td>2011/12</td>
<td>5 yr olds</td>
<td>Supports SHA water fluoridation reports Links with Wales Y1 and Scotland P1</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys</td>
</tr>
<tr>
<td>2012/13</td>
<td>12 yr olds caries, (ortho and) enamel mottling</td>
<td>Links with CDHS</td>
<td>APHO profiles Health Survey for England, Child height and weight measurement, local health and lifestyle surveys, <strong>Decennial CDHS</strong></td>
</tr>
</tbody>
</table>
The explanatory paragraphs below, outline the agreed process for the delivery of this programme which built on the original arrangements and placed it within the Public Health Information Strategy. The details of this new process were negotiated with other PHOs by NWPHO/TDO.

In each survey year:

- National protocols including sampling methodology will be developed on behalf of PCTs by NWPHO/TDO with appropriate advice from BASCD and made available to PCTs.
- As directed, PCTs should commission the relevant epidemiology activity from their provider arm or from a provider with the necessary skills and experience to undertake it.
- In order to ensure compliance with the protocol and to ensure the quality and comparability of the results, national training and calibration is provided in collaboration with BASCD regional examiners and trainers. This training and calibration is then cascaded to each of the ten SHA regions. Where new survey methods are developed NWPHO (with expert input from TDO) will commission or provide this training and calibration.
- In order to ensure compliance in each region, a regional coordinator who works closely with the SHA Dental Public Health Lead and SHAs should be appointed. These posts are very important in terms of quality assurance and data interpretation at a local level. In most cases the coordinators have been undertaking this role on a voluntary basis and consideration should be given to providing a firm financial basis for these posts together with an appropriate appointment process.
- PCTs are responsible for securing the provision of the data and sending the cleaned, raw data, via Regional Coordinators to the NWPHO/TDO to carry out the quality control and analysis.
- Following collation and analysis, NWPHO/TDO is responsible for disseminating the national analysis to DH and regional datasets to the SHAs and the other PHOs.
- A summary level report and data tables are published on the programme website.

**The expected benefits of the new arrangements**

As a result of these new arrangements it is expected that the new national datasets will provide:

- Quality assured information for the NHS to support oral health needs analysis and local commissioning.
- An ability to link dental health data with other datasets (eg. deprivation, geodemographics, public health common datasets etc.), to help inform national social marketing initiatives.
- An enhanced inclusion of dental health data in other national public health intelligence outputs (eg Health profiles).
- Information for SHAs in reporting the dental health data for the SHAs to monitor the health effects of water fluoridation.
- Greater dissemination of results to a wider audience to inform policy and commissioning.
- Support to SHAs in monitoring PCT compliance with surveys across England.
Financial Support and Sustainability

In order to ensure the delivery of the programme and realise the benefits, the Department of Health provided funding of £100,000 via the Public Health Information Strategy, subject to recurrent annual funding of £10,000 per SHA being agreed. This was to ensure that the surveys continued as outlined in the five year plan, and that the benefits of the new programme are realised.

Summary

The background to the establishment of the National Dental Epidemiology Programme has been explained and the new approach to delivering the programme has been described. Oral health data will be integrated within the general health datasets held by PHOs. This process will provide increased outputs for the NHS, including the localised socio-demographic dental data that SHAs and PCTs will need in terms of assessing oral health needs and commissioning the services required to meet local need.

Update on progress

Enabling work

To provide the necessary infrastructure to allow communication for a range of purposes, the NWPHO set up a dedicated web area within their website to fulfil the following functions:

- Provide access to the protocols and support materials.
- Allow secure uploading of data from PCTs via the regional coordinators.
- Allow progress tracking by regional coordinators.
- The publishing of results and analysis of the findings in narrative, tabular and interactive formats.

Figure 1: The Programme home page and the secure data interchange
2007/08 Survey of five year olds

A national protocol was developed for this survey by the TDO/NWPHO and made available to PCTs via the programme website. Training and calibration was undertaken in collaboration with BASCD.

The survey was undertaken during the school year 2007/08. The sampling frame was children attending mainstream schools who were aged five years at the time of the survey. Data was collected by trained and calibrated examiners employed by PCTs. The training and calibration of examiners was carried out using the methodology described by Pine (Pine et al, 1997a). BASCD criteria for clinical examination (Pitts et al, 1997) were employed as in previous surveys. This involves visual-only detection of missing teeth, filled teeth and teeth with obvious dentinal decay. The presence and absence of plaque and oral sepsis were also recorded.

The survey was conducted according to a standard protocol which gave details of the sampling methodology to be employed (based on Pine et al, 1997b). For the first time the primary sampling unit was Local Authority (LA). Samples were drawn for each LA in England using the same methods and similar sampling intensities as used in the past. The methodology also allowed for representative PCT samples.

Following guidance from the Deputy Chief Dental Officer in 2005, the protocol also required that positive consent was obtained prior to the survey from the child’s parent or from someone with the competence to give consent on behalf of the child. In previous surveys, parents were informed about the survey and unless the parents objected, children were examined.

The data was collected using the Dental Survey Plus 2 software and electronic files of the raw, anonymised data were sent to TDO via a secure web portal. Data cleaning and quality checks were undertaken before the data was transferred to the NWPHO for analysis.

Data was uploaded to the NWPHO website as required by the protocol and was cleaned and quality assured in the autumn of 2008. Analysis began in the spring of 2009 and it became clear that the response rate was very variable due to the requirement for positive consent.

Population weighting was used to calculate estimates of a range of measures of oral health for each LA and PCT. The postcode of residence for each record was used to assign a deprivation score and these were then used to allow weighting of the sample data to more closely match the actual distribution of deprivation quintiles in the source population.

In total 147 out of 152 PCTs took part in the survey covering 338 out of 354 Local Authorities. A total of 139,727 clinical examinations were included in the final analysis.

The overall response rate to the survey samples was 66.8%. Possible non response bias cannot be ruled out and comparisons with other surveys should not be made without reference to the response levels.

A narrative report and tables of results at PCT, LA and regional level are available on the programme website: http://www.nwph.info/dentalhealth/caveat.htm . Figure 2 shows the results page and an example data table.

This data is now being included in the Local Authority Health Profiles produced by the Association of Public Health Observatories.
Figure 2: Results page and example data table

Figure 3: Interactive mapping presentation of the data is also available on the website
2008/09 Survey of twelve year olds

A national protocol was developed to support the twelve year old survey and placed on the programme website. Training and calibration took place with the support of BASCD and the majority of the data has been uploaded and cleaned ready for analysis. In common with the process for the five year old survey the data, although collected by PCTs by the end of the summer term in 2009, was not uploaded by the expected date of the 31st of August 2009. This has meant a delay in the ability to analyse the data.

Figure 4: Profile of data upload

This is an issue which needs to be addressed if timely results of the surveys are to be published and requires SHAs to take a stronger role in managing the performance of PCTs.

Quality checks have been undertaken on the data received so far and the results are as follows:

- 122,531 records received & checked
- 35,073 errors

The identified and subsequently corrected errors relate in the main to the following issues

- Birth Details / Date of exam
- Consent / Examination status
- Postcode / PCT code / LA code
- Duplicate records
- Incorrect coding of Ortho / White marks
The expected outputs and time scale for the twelve year old survey are as follows:

- Web tables and short narrative - Autumn 2010.
- Caries levels, orthodontic need and demand, self perception of enamel opacities and self reporting of dental health impacts at LA and PCT level.

### Dental health profiles

Part of the programme for 2010 onwards was to undertake collaborative work with the NHS Information Centre to develop a single point of access to a range of data which are relevant to the commissioning of dentistry and oral health. The type of information is likely to include:

- Sociodemographic data
- Dental epidemiology data
- Treatment data
- Workforce

Work has been progressing with the information centre to agree the appropriate information, and to clarify governance issues with the aim of producing a web based product which would assist PCTs in understanding the oral health commissioning needs of their populations and in benchmarking their approach to commissioning and delivery.

**Figure 5: An example of linking data on oral health and obesity**
Collaborative work with the Adult Dental Health Survey (ADHS)

The programme for 2009/10 has involved a departure from the tried and tested methodologies of the five and twelve year old child surveys. It was agreed that supplementary surveys focussing on specific sub groups of the population would be conducted to complement the National Adult Dental Health Survey commissioned by the NHS Information Centre.

The NWPHO and TDO have been involved in the planning and commissioning of the ADHS and have facilitated agreement on the three adult subgroups to be covered by the supplementary surveys.

Detailed protocols for each of these three groups have been developed, maintaining methodologies where appropriate to allow comparison of results between the adult subgroup questionnaires and clinical examinations and the main adult survey.

Computer formats for data collection were developed by TDO and distributed to PCTs.

As these were new protocols which included new methodologies, three national training events for PCT epidemiology teams were provided in Birmingham, London and Leeds.

**Figure 6: Training in progress**

To support this training a re-edit of the training DVD for the main ADHS was commissioned which included specific details relating to the protocols for the adult sub groups. Copies of the DVD were provided to participating PCTs.

**Figure 7: Screen shot from the DVD**
Not all PCTs are taking part in the Adult Subgroup Surveys as a number are providing examiners for the main survey. Table 2 shows the number and distribution of the PCTs taking part in the training.

Table 2: Number of PCTs that attended training for the Survey of Supplementary Adult Sub Groups

<table>
<thead>
<tr>
<th>PCT</th>
<th>Total No. of PCTs</th>
<th>No. PCTs involved in main ADHS</th>
<th>No. of PCTs attended training for SASG surveys</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Midlands</td>
<td>9</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>East of England</td>
<td>14</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>London</td>
<td>31</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>North East</td>
<td>12</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>North West</td>
<td>24</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>South Central</td>
<td>9</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>South East Coast</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>South West</td>
<td>14</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>West Midlands</td>
<td>17</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Yorkshire &amp; the Humber</td>
<td>14</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>152</strong></td>
<td><strong>49</strong></td>
<td><strong>58</strong></td>
</tr>
</tbody>
</table>

Data collection is currently underway, upload to the NWPHO is expected by 31st August and results available (as agreed by protocol with the NHS IC and ADHS) in spring 2011.

Summary

This report has shown the range of activities taking place within the NHS (England) Dental Epidemiology Programme and the key roles The Dental Observatory and North West Public Health Observatory have played in revitalising the programme.

The new arrangements have worked well thus far and have resulted in:

- Increased clarity about the programme.
- Improved compliance by PCTs undertaking surveys.
- Improved quality due to the provision of national protocols.
- A broadening of approaches which include surveys of adults.
- The inclusion of dental health data in general health datasets.
Next steps

Further improvements will be gained from:

- Greater engagement with commissioners in both the commissioning of surveys and in use of the information produced.
- More active performance management of PCTs by SHAs with regard to taking part in surveys.
- Greater support for Regional Coordinators and trainers by SHAs.
- Clarity of programme activity beyond 2013.
 Appendices

Appendix A

STATUTORY INSTRUMENTS

2006 No. 185

NATIONAL HEALTH SERVICE, ENGLAND

The Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006

Made 26th January 2006

Laid before Parliament 6th February 2006

Coming into force 1st April 2006

The Secretary of State for Health makes the following Regulations in exercise of the powers conferred by section 16CB(1) of the National Health Service Act 1977[1]:

Citation, commencement and interpretation

1.—(1) These Regulations may be cited as the Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006 and shall come into force on 1st April 2006.

(2) In these Regulations—

"the Act" means the National Health Service Act 1977;
"oral health promotion programme" means a health promotion and disease prevention programme the underlying purpose of which is to educate and support members of the public about ways in which they may improve their oral health;
"oral health survey" means a survey to establish the prevalence and incidence of disease or abnormality of the oral cavity; and
"water fluoridation programme" means—
(a) until the coming into force of section 58 of the Water Act 2003[2] (fluoridation of water supplies), fluoridation arrangements made under section 87(5) of the Water Industry Act 1991 (fluoridation of water supplies at request of health authorities); and
(b) upon the coming into force of section 58 of the Water Act 2003, fluoridation arrangements made under new section 87(1) (fluoridation of water supplies at request of relevant authorities) of the Water Industry Act 1991.

Exercise of functions of Primary Care Trusts

2.—(1) A Primary Care Trust shall have the following functions in England.

(2) A Primary Care Trust shall provide, or secure the provision of, the following, to the extent that it considers necessary to meet all reasonable requirements within its area—

(a) oral health promotion programmes;
(b) dental inspection of pupils in attendance at schools maintained by local education authorities; and
(c) oral health surveys to facilitate—
   (i) the assessment and monitoring of oral health needs,
   (ii) the planning and evaluation of oral health promotion programmes,
   (iii) the planning and evaluation of the provision of primary and specialist dental services, and
   (iv) the monitoring and reporting of the effect of water fluoridation programmes.

(3) A Primary Care Trust shall participate in any oral health survey required by the Department of Health as part of a survey conducted or sponsored under section 5(2)(d) of the Act [1] (other services).

Rosie Winterton
Minister of State,

26th January 2006 Department of Health
Appendix B

Gateway No. 10639

DIRECTIONS

NATIONAL HEALTH SERVICE ACT 2006

Directions to Primary Care Trusts concerning the exercise of Dental Public Health functions 2008

The Secretary of State for Health makes the following Directions in exercise of the powers conferred by section 8 of the National Health Service Act 2006(a):

Citation, commencement, application and interpretation

1.—(1) These Directions may be cited as the Directions to Primary Care Trusts concerning the exercise of Dental Public Health functions 2008, are given to all Primary Care Trusts in England and come into force on 24th November 2008.

(2) These Directions apply to England only.

(3) In these Directions—

“Functions of PCTs Regulations” means the Functions of Primary Care Trusts (Dental Public Health) (England) Regulations 2006(b);

“oral health promotion programme” has the same meaning as in the Functions of PCTs Regulations;

“oral health survey” has the same meaning as in the Functions of PCTs Regulations.

Oral health promotion programme

2. In exercising the function set out in Regulation 2(2)(a) of the Functions of PCTs Regulations a Primary Care Trust must have regard to—

(a) the good practice guidance Choosing Better Oral Health — an Oral Health Plan for England published on 14 November 2005 (Gateway No. 4790(c) and

(b) Delivering Better Oral Health — An evidence-based toolkit for prevention published on 26 September 2007 (Gateway No. 8504(d)).

Dental inspections in schools

3. In exercising the function set out in Regulation 2(2)(b) of the Functions of PCTs Regulations a Primary Care Trust must have regard to the guidance on Dental Screening (inspection) in schools and consent for undertaking screening and epidemiological surveys issued on 18 January 2007 (Gateway No. 7698(e)).

(a) 2006 c. 41. There are no relevant amendments.

(b) S.I. 2006/183.


Oral health surveys

4.—(1) In exercising the function set out in Regulation 2(2)(c) of the Functions of PCTs Regulations a Primary Care Trust—

(a) must undertake oral health surveys in accordance with—
   (i) the NHS (England) dental epidemiology programme and timetable(a);
   (ii) nationally agreed protocols made available through the North West Public Health Observatory in association with the British Association for the Study of Community Dentistry(b).

(b) may additionally undertake any locally determined oral health survey it considers necessary to meet the reasonable requirements within its area.

(2) In exercising the function set out in Regulation 2(3) of the Functions of PCTs Regulations a Primary Care Trust must make available appropriate staff to participate in the oral health surveys mentioned in that provision.

Signed by authority of the Secretary of State for Health
Date 17 November 2008

Chris Audrey
A member of the Senior Civil Service

(a) http://www.pct.nhs.uk/135,
(b) http://www.dental-observatory.nhs.uk/Default.aspx?xnum0=0020800763C6108300019B,
Acknowledgements

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