Childsmile: the national child oral health improvement programme in Scotland. Part 1: establishment and development

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IN BRIEF

- Describes the development of the child oral health improvement programme in Scotland.
- Outlines a model of service redesign with significant workforce development of the dental team.
- Suggests how a directed population approach to prevention may be developed.

PRACTICE

VERIFIABLE CPD PAPER

This paper is the first of two reviewing the Childsmile programme. It sets out to describe the development and implementation of this national oral health improvement programme for children in Scotland over its initial three-year period (January 2006 to December 2008) and into its second phase of development. It outlines the context in which the initiative was conceived, the initial development of its various components, and how monitoring and evaluation are shaping the delivery and direction of the programme.

BACKGROUND

National Health Demonstration Projects (NHDPs) were established in Scotland over ten years ago, following the publication of the UK Government Report 'Towards a Healthier Scotland'.[1] Four NHDPs were established in 1999 in the priority areas of child health, sexual health of young people, coronary heart disease and cancer. A second phase of the programme was established in 2003, and in 2005 child dental health was added to this portfolio. The purpose of all NHDPs is to act as testing grounds for national action, and to provide a learning resource for the rest of Scotland by combining the best existing evidence with innovative practice. Funded from 2003 by the (then) Scottish Executive, they all shared an initial three year lifespan and resources to support evaluation and embedded research projects.

The addition of a child oral health programme to the NHDP portfolio was a response to the persistently high rates of dental caries among children in Scotland. These high rates are compounded by significant inequalities in oral health[2] and poor use of and access to services. Annual reports of the Scottish Dental Practice Board[3] have shown low rates of NHS dental registration for young children (35% of 0-2 year-olds in 2004), and a review of the provision of dental care to children registered under the capitation payment system highlighted extremely limited preventive activity.[4] This paper describes the establishment and development of the new child oral health programme since 2005; its companion paper reviews monitoring arrangements and summarises programme activity data.[5]

ESTABLISHMENT OF THE PROGRAMME

The Childsmile programme was initiated by the Scottish Executive's 2005 policy document *An action plan for improving oral health and modernising dental services in Scotland*.[6] Its aim was to improve the oral health of children in Scotland and reduce inequalities both in dental health and in access to dental services by shifting the balance of care towards more preventive and anticipatory care and promoting health improvement from infancy. The programme was informed by published clinical guidelines[7,8] and by experience gained from previous child oral health improvement programmes in Scotland. These had a focus on health visitor-led health promotion,[9] clinical prevention within primary dental care,[10] and community development based initiatives.[11,12] Its emphasis on reducing inequalities in oral health is consistent with government policy in both the Scottish and English contexts.[1,6,13,14] The programme draws on the health promotion framework set out in the WHO *Ottawa Charter*,[15] ie building healthy public policy, creating supportive environments, strengthening community action, developing personal skills, and reorientating health services. Consultation with a wide range of groups and experts has been ongoing during the development of the demonstration programme (Fig. 1).

Initially two demonstration programmes were established in early 2006, one in the East of Scotland and one in the West. In the West, the programme was set up to target children from birth and to promote oral health improvement and caries prevention in dental practice/salaried primary care dental services and in local community settings. The East of Scotland programme was designed to deliver additional clinical prevention activities through salaried primary care dental services, aimed at children aged three years and above attending priority nursery and primary school establishments.

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The programmes had an initial three year demonstration phase, and were expected to evolve in response to ongoing monitoring, evaluation, and stakeholder feedback. Both followed a targeted approach to improving the oral health of young children, and complemented the established national toothpaste/toothbrushing scheme for all Scottish children up to six years of age.[16] This combination of targeted and population-based interventions and the rationale behind it are discussed further by Shaw *et al.*[17]

In 2008 these programmes were redesignated as four interlocking elements combining both targeted and population-based approaches: Childsmile Practice, Childsmile Nursery, Childsmile School, and Childsmile Core. The following year saw the start of a two year interim phase which would see the rollout of these integrated elements across Scotland, culminating at the end of that time in their adoption as mainstream child dental services.

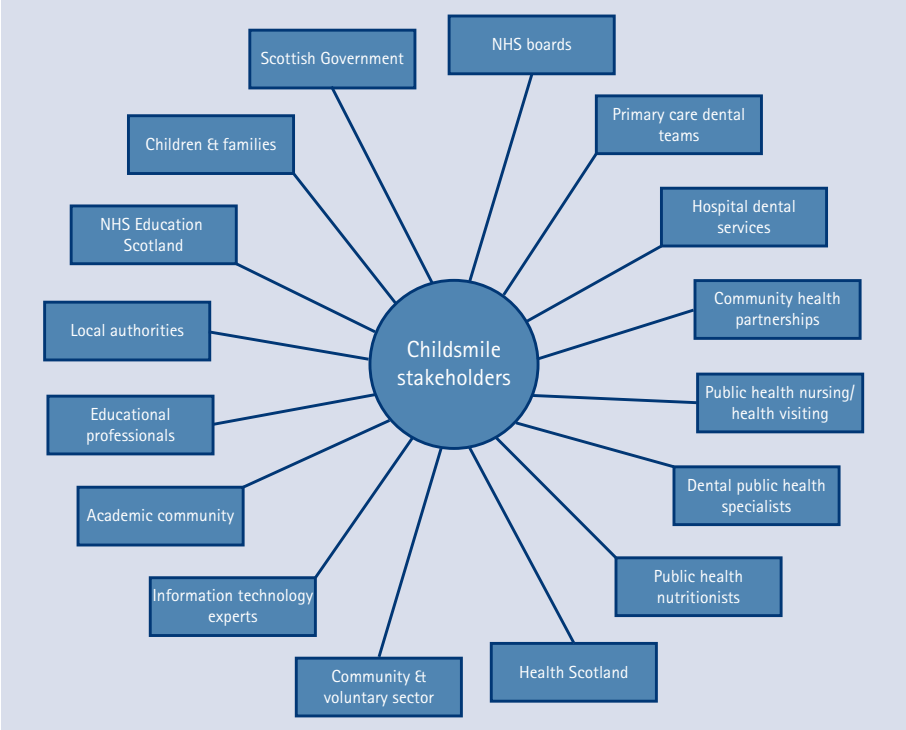

Fig. 1 Stakeholder map

Childsmile Practice

Childsmile Practice commenced in January 2006, operating from primary care dental services in deprived communities across the West of Scotland. It focused in the first instance on infants under 2-years-old, expanding to include older children as it developed. The initial aims of Childsmile Practice were to:

- Build on and establish formal links between primary care dental services and the public health nursing/health visiting service
- Raise parental awareness to support the development of good oral health behaviours in childhood
- Promote the provision of oral health promotion and clinical prevention within primary care dental services.

During the demonstration phase of the programme, health visitors in Childsmile Practice areas adopted a Caries Risk Assessment (CRA) protocol to identify infants (11 days - eight weeks old) at increased risk of developing dental caries. With parental consent, families of such infants were referred to Dental Health Support Workers (DHSWs) - a new group of staff recruited, trained and funded through Childsmile, and employed by Community Health (and Care) Partnerships (CH(C)Ps). DHSWs work closely with health visitors to provide a focus on community-based oral health improvement, one-to-one family support and liaison between health care services. They visit the Childsmile-enrolled families in their homes to encourage and facilitate attendance at Childsmile dental services, reinforce oral health messages between dental visits, and link families to other community activities or resources (eg weaning fairs, cooking on a budget skills, food cooperatives) that support oral health.

All dental practices within the target areas were invited to join the programme and those accepting were offered central support in the form of guidance, training and finance. The practice payments consisted of quarterly payments for ongoing delivery of the service; a training allowance granted either to reimburse the dental nurse for time spent and travel expenses incurred in attending evening training, or to allow the practice to backfill staff participating in daytime training; and a capitation payment for each child enrolled in Childsmile, payable in addition to existing NHS payments.

Families are encouraged by the DHSW to visit either a general dental service (GDS) practice or primary care salaried services, starting when their child is around six months of age, with at least six monthly intervals thereafter. Childsmile sessions in these settings include dietary advice, toothbrushing demonstrations and clinical prevention tailored to the needs of the child. The programme promotes skill mix and a team approach to the delivery of care, with sessions delivered by the most appropriate member of the dental team. Families requiring additional care are expected to receive longer or more regular appointments with dental services. This is usually delivered by an Extended Duty Dental Nurse (EDDN) trained by Childsmile in oral health promotion and fluoride varnish application (see below). When fluoride varnish is applied by an EDDN, a dentist must first review relevant aspects of the child's medical history and provide a written prescription for the varnish application. Any change to the child's medical history which may be relevant to fluoride varnish application also requires the EDDN to consult with the dentist. As the child gets older, other members of the dental team become more involved to ensure oral health assessments are conducted and appropriate preventive and restorative care is provided. The programme follows SIGN guidelines[7,8] and will incorporate any future guidance relevant to the Scottish context. [18]

Childsmile Nursery and Childsmile School

Childsmile Nursery and Childsmile School provide clinical prevention activities

delivered through salaried primary care dental services for children attending priority nursery and primary schools. 'Priority' is defined as the 20% of nursery and primary schools with the highest proportion of children living in the most deprived local quintile of postcode areas, identified through the Scottish Index of Multiple Deprivation (SIMD).[19]

Nursery and Childsmile School aim to:

- Improve the oral health of children aged three years and over who would most benefit from preventive dental care
- Facilitate further dental care for children deemed in need
- Promote awareness about sound oral health to help engender appropriate behavioural change in children.

Children attending priority nurseries or schools are offered twice-yearly fluoride varnish interventions, applied by EDDNs, and are helped to register with a dentist. As it is the establishment that is prioritised, as opposed to the identification of an individual child, all attending children are offered the intervention. This removes the need for individual treatment plans. A robust process of parental consent and validation for placement of the fluoride varnish is in place.

Unlike those staff working in Childsmile Practice, DHSWs working in this setting are largely employed via salaried primary care dental services. The role of the DHSW in Childsmile Nursery and Childsmile School is to liaise with nursery and school staff, meet parents, introduce the programme and seek consent which includes recording a basic medical history pertinent to oral health. They remain the main dental contact point and thus occupy an ideal position to introduce oral health promotion and clinical preventive care in the education setting.

On receipt of completed consent forms, the medical history of each child is reviewed by a nominated salaried dentist. Consented children whose medical history does not carry any contra-indication receive an individual prescription for fluoride varnish, which is recorded on the consent form. If a child has a contraindication they are excluded from fluoride varnish treatment within the educational setting but are offered the other benefits of the programme, for example help to find and register with a dentist.

As the companion paper[5] to this details, the programme has generated records relating to tens of thousands of individual children and their families. The Health Informatics Centre (HIC), working with the Dental Health Services & Research Unit, University of Dundee, was commissioned to develop an eHealth solution to capture routine data and related information about children enrolled in Childsmile Nursery and School, facilitating the monitoring of consent processes and fluoride applications. The flexibility of this infrastructure, together with the recording of the Community Health Index (CHI), allows for future linkages between Childsmile Nursery and School and other key databases.

Financial and workforce pressures would render the delivery of such a large scale fluoride varnish programme through the dentist or hygienist/therapist workforce alone unfeasible. The General Dental Council's (GDC's) inclusion of fluoride varnish application by the dental nurse in their Scope of Practice in 2007 allowed a public health intervention of this nature to take place, and offers dental nurses an additional skill which they can develop during their careers. As children progress through primary school they may also receive fissure sealants from a dentist, hygienist or therapist to provide additional protection against decay.

Childsmile Core

The Childsmile programme was designed to complement a national toothpaste/toothbrushing scheme which had been set up a few years previously. This initiative involves the free distribution of toothpaste/toothbrush packs to every child in Scotland on at least six occasions during their first five years, plus the offer of free daily toothbrushing to every 3 and 4-year-old child attending nursery in Scotland. Additionally, the toothbrushing programme is available to first and second year primary school children in schools situated in disadvantaged areas of NHS Boards across the country. Coordination of this programme, now referred to as Childsmile Core, has led to national procurement of supplies and the publication and implementation of national standards.[16]

DEVELOPMENT OF CHILDSMILE 2006–2009

Workforce development

It was recognised that staff delivering the Childsmile programme would require specific training. In January 2006 five courses were set up across the West of Scotland to deliver oral health promotion training to dental nurses nominated by their dental practice. Evaluation of this training indicated that a good understanding of oral health promotion was achieved. However, participants requested more focus on tailoring of key messages to the specific age at visit outlined in the care pathway and on practical preparation for delivering Childsmile in their clinics. This feedback resulted in further development of the training courses, combined with the production of a bespoke Childsmile care manual providing age-specific guidance to support health professionals to deliver Childsmile oral health sessions.

A similar training course was set up in the East of Scotland to train dental nurses in the principles of Childsmile and in the extended duty application of fluoride varnish. This extended duty dental nurse training course was approved by the Education Committee of the GDC in July 2007. Dental nurses receive clinical teaching in the application of fluoride varnish in phantom head clinics before carrying out supervised direct observational procedure assessments in their place of work. The course incorporates a nutrition and oral health promotion focus, supplemented by the Childsmile clinical manual's detailing of procedures and protocols for the application of fluoride varnish, and consent and data management processes. Once GDC approval for the course had been obtained, dental nurses working in dental practices in the West of Scotland who had trained initially in the oral health promotion aspects of Childsmile underwent further training in extended duty fluoride varnish application.

Additional training has been provided in relation to working with families, multi-agency working and data management processes to equip DHSWs with the knowledge and skills to best support children and families within the Childsmile care pathway. In December 2007 the training courses in the West and East of

Scotland were amalgamated to provide one Childsmile training course for both dental nurses and DHSWs encompassing all aspects of the programme.

Childsmile has provided the opportunity for workforce development and increased skill mix relating to the provision of oral health care for children. DHSWs have received a broad training to help them provide the link between families, primary care dental services and other community-based services and organisations. EDDNs have been able to develop additional skills, and for the first time have their own patient base, delivering both oral health promotion and clinical application of fluoride varnish to the teeth of young children as part of a community preventive programme.

Monitoring and evaluation

As a national health demonstration project, monitoring and evaluation are integral to Childsmile. Key evaluation questions include whether the programme does improve health and oral health; whether it can reduce health-related inequalities; and, if so, which components of the intervention are responsible for the biggest sustained improvements. Comprehensive monitoring and evaluation of Childsmile is led by the Community Oral Health Section, University of Glasgow Dental School, where the Childsmile Evaluation and Research Team (CERT) is based. The CERT team is responsible for overall monitoring and evaluation, and maintaining databases of caries risk assessments, practice visits and general dental practitioner payments. The evaluation is guided nationally by an Evaluation Board which includes representatives from the Universities of Dundee (Dental Health Services & Research Unit), and St Andrews (Health Psychology, Bute Medical School), as well as the host institution, the University of Glasgow.

While evaluation follows a 'theory-based model'[20,21] the complex and dynamic nature of the Childsmile intervention requires a multi-faceted, multi-level and evolving approach. Evaluation responds to issues emerging from programme implementation, while in turn the programme develops as a result of monitoring and evaluation findings. For example, it became evident during 2007 that, relative to the birth rate, assessments and invitations into Childsmile were lower than anticipated. Qualitative work carried out with health visitor staff suggested that this may relate to professional perceptions of the families 'most in need' or conversely that for some families the personal circumstances are too complex to introduce them to Childsmile. Families themselves may decline the invitation to enrol into Childsmile for a variety of reasons, including the way the programme was introduced to them by health staff, perhaps because they did not want to identify with a targeted service or because they wanted to obtain dental care from a practice known to them but which was not currently delivering Childsmile. To encourage enrolment rates, the CRA form was simplified and inserted directly into the child record via NHS Board Child Health Departments, promotion and discussion of Childsmile with health visitor teams and Community Health Partnership management strengthened, and the drive to recruit new practices maintained. An additional referral pathway was created for dental services to enrol children directly into Childsmile after dental practitioners suggested that they could identify children within general practice who would benefit from Childsmile, but had either missed the opportunity at birth or had not wanted to participate in the programme at that time.

Monitoring data on failed appointments at dental services and qualitative work undertaken with DHSW and health visitor staff has also highlighted challenges in maintaining contact with families following their initial enrolment. This led to changes to the timing of family visits to dental services, for example delaying the first appointment until six months of age, and greater flexibility for continued home support by the DHSW where required. It is considered that this evolved model will allow DHSWs to work with families more intensively, helping to build a rapport and to develop the family's capacity to engage with dental services.

Two pieces of embedded research also focus on barriers to and facilitators of uptake of Childsmile services. The first aimed to 'inform the communication strategy and the development of local social marketing campaigns designed to improve uptake of the Childsmile programme as the routine dental service from birth', and was undertaken by The Institute for Social Marketing, University of Stirling. The research adopted qualitative methods using focus groups and mini-groups of parents and relevant professionals.[22] Many of the most hard-to-reach families have serious health issues and possible psychopathology, including substance misuse and mental health problems. Faced with having to prioritise needs, these parents may understandably avoid or overlook Childsmile participation opportunities. This analysis also indicated that some parents are anxious and apprehensive about filling in forms and that others may experience linguistic difficulties either due to illiteracy or because English is not their first language. The response to these issues was to engage someone familiar with particular parents (for example a nursery school staff member working with the DHSW) to support families in form-filling and explaining the programme. In order to better understand the challenges in including 'hard-to-reach' families, a second embedded study focuses on this group. NHS Health Scotland, the Special NHS Board responsible for health improvement, is working with Childsmile to implement the recommendations of the Institute for Social Marketing Report in order to develop a comprehensive communications strategy, including the hosting and development of the Childsmile website.[23]

For Childsmile Nursery, the success of the fluoride varnish programme largely depends on gaining consent from parents. Routine monitoring via HIC/DHS&RU indicated that consent levels and number of successful applications varied considerably between individual nursery schools. Further examination of these discrepancies has led to the development of local responses to the consent-taking process. One example is the introduction of sessions to allow familiarisation of parents, children and teachers with both the varnish application procedure and Childsmile staff. A second is the provision to school staff of lists of children who are signed-up to Childsmile, allowing staff to 'chase up' unreturned consent forms. The consent form itself has been revised following local consultation.

INTERIM PHASE 2009–2011

In the 2007 Action Plan *Better health, better care*[24] the Scottish Government

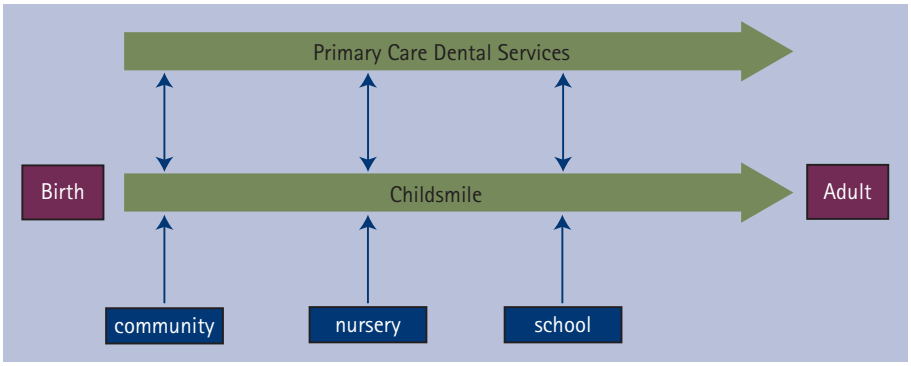

Fig. 2 Childsmile care pathway

confirmed the expansion of the integrated Childsmile model into the North of Scotland NHS Boards. This Interim Phase began in 2009, with all 14 NHS Boards in Scotland working towards developing a fully integrated model encompassing Childsmile Practice, Nursery, School and Core. To facilitate this development, programme management has been re-structured, with a national Childsmile Programme Board providing strategic direction and oversight of the integrated approach, and Local Implementation Groups continuing at an NHS Board level. Alongside these management changes, NHS Education for Scotland (NES) assumed responsibility for the training of all EDDNs and DHSWs delivering Childsmile and has convened a National Oral Health Improvement Team to develop, coordinate and deliver training across Scotland. This team is responsible for the further development of Childsmile training as the programme matures. In time, it is anticipated that this course will be put forward for formal accreditation.

Work led by the multidisciplinary national Dental Informatics Group is also underway to develop Information Management and Technology for Childsmile. These eHealth developments, including systems for data capture, transmission, and record linkage, are being piloted and evaluated in keeping with the wider evaluation strategy, and involve the HIC/DHS&RU facilities for some of the nursery/school elements. It is envisaged that this will result in a longitudinal record of patient care and robust electronic links to access dental services at various ages via health, community and education settings. This would include linking the National Dental Inspection Programme to Childsmile, with DHSWs available to follow up those children identified as being in need of dental care.

As part of the potential future NHS dental service for children in Scotland, Childsmile Practice must operate on the principle of universal access. However, this does not mean uniform provision of service. Childsmile is now moving to a model whereby the health visitor promotes the programme to the families of all newborn children. Families may also be enrolled directly into primary care dental services via dental practices themselves and DHSWs. More intensive support will be directed towards children and families most in need through community, primary care dental services, nurseries and schools. DHSWs will be concentrated in communities with higher need, where parents and carers will be supported and empowered to keep their children's teeth healthy. Clinical preventive activities will continue to be targeted towards priority nursery and primary schools, while still being available in primary dental care settings. Thus children may receive fluoride varnish treatment at their dental practice, clinic, nursery and/or school, maximising the opportunity for prevention. Over time, the integrated model should provide a continuum from birth through childhood, with appropriate care pathways for children with different levels of need (Fig. 2).

CONCLUSIONS

Childsmile continues to develop and evolve, and many challenges lie ahead as the new integrated programme rolls out across Scotland. Experience suggests that, while all components of this service development will be available in all NHS Boards, the balance in provision from practices and salaried services and within Community Health Partnerships will vary according to local circumstances.

The companion paper[5] details evidence that Childsmile has begun to establish a robust, flexible and effective model of child dental care with the potential for delivering sustained improvement in the dental health of children in Scotland and a reduction in oral health inequalities.

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