Improving children's oral health in Wales through partnership

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RETHINKING SELF-CARE

Giving every child the best start in life is crucial to reduce poor oral health in later life. What is not generally appreciated, until confronted by the morbidity associated with untreated tooth decay, is how integral good oral health is to a child's overall health. As less than 3% of children in the UK visit a dentist before their first birthday, it is important for paediatricians to be aware of the risk factors for dental caries, particularly the structural determinants of oral health, and can provide evidence-based prevention advice.[1]

The aetiology of caries is complex, influenced by individual factors (primarily dietary and poor oral hygiene) and population level factors (socioeconomic status, ethnicity, health literacy, cultural practices and access to care). It remains the predominant oral disease of childhood, with links to free sugar consumption in supplementary foods, and behaviours such as nocturnal bottle feeding. Early childhood caries experience is reflected by an elevated risk into adulthood, indicating that caries is a 'legacy disease'. Low income and educational attainment levels are associated with widening the health literacy gap, which further influences access to dental services.

In Wales, there has been an ambitious policy directive, underpinned by primary legislation, to improve well-being and oral health. The Dental Epidemiology Programme for Wales, working alongside the Oral Health Information Unit, conduct regular surveys of dental disease in 5-year-old and 12-year-old cohorts, which informs policy, local dental service planning and educational programmes.

Despite a global decline in caries prevalence, inequities persist among children living in poverty or socially marginalised groups.[2] While the steady improvement over the last 50 years reflects greater public awareness, exposure to fluoride and better diets, Wales National Dental Epidemiology (DEP) data recognises that a third of 5 year olds in Wales continue to experience advanced tooth decay. Dental extractions continually remain the most common reason for hospital admissions in this age group, despite public health messaging, professional intervention and policy influences.[3]

Poverty is a significant health determinant, while the prevalence of tooth decay, a preventable condition, remains an undisputed marker of inequity across the UK. Untreated dental disease not only impairs a child's general development, a consequence of sleep disturbance, impaired nutrition or disrupted schooling, but it also understates the wider psychological, social and financial harm on families, as identified within DEP data.

Parental involvement in establishing good oral hygiene habits is key, and the preschool years are an essential period for establishing lifelong behaviours. Promoting parental supervised toothbrushing is crucial but is influenced by a complex set of associated factors, including health literacy, motivation, parental habits, attitudes, beliefs, self-efficacy, family dynamics, social norms and the child's behaviour. In response to the prevailing oral health status gaps between the most and least well-off families, the Welsh Government published an Oral Health Action Plan in 2007. This outlined a commitment to tackle inequalities by improving children's oral health through a nationally co-ordinated prevention programme termed Designed to Smile (D2S).

FOCUS ON PREVENTION

The premise for D2S (figure 1) was to implement a sustainable supervised toothbrushing programme in nurseries and primary schools, providing free toothbrushes and fluoride toothpaste packs to families, with supplementary fluoride varnish applications for high risk children. The programme scope serves the partnership ambition outlined in the National Institute for Health and Care Excellence(NICE) Public Health Guidance (PH55), using local population demographic data to direct evidence-based resources through the Community Dental Services with strategic support and monitoring provided by Public Health Wales.[4]

The programme incorporates further preventive measures such as topical fluoride applications in non-clinical settings which, in addition to regular toothbrushing, optimises caries reduction. However the underpinning principle of behaviour change is integral, which requires regular educational support for teachers and children, with a focus on the importance of self-care. Enhancing partnership working develops confidence, knowledge and skills to better self-maintain regular oral health practices, which reduces reliance on professional services. D2S has been widely accepted by primary care dental practices, as it has enabled meaningful, prevention focused, conversations with the public.

By 2017, based on epidemiological and research evidence, the programme was revised to ensure it targeted those children at greatest risk of dental decay. This introduced proportionate universalism, based on the premise that help is directed to those in most need to address inequalities. Preventive activity was reprioritised for younger children through collaboration with early years health professionals and integration with the Healthy Child Wales Programme.

IMPLICATIONS FOR PAEDIATRIC PRACTICE

As general and community paediatricians are the forefront of health provision for a wide range of chronic conditions, this provides an opportunity for early identification of those at higher risk of dental disease and incorporating prevention into every consultation. Advocating for greater universal dental care for children assists in embedding existing policy direction.

Supervised toothbrushing programmes are cost-effective in areas of high caries prevalence, where community water fluoridation does not exist or when children are not brushing two times per day with a fluoride toothpaste. Health economic evaluation of the Scottish ChildSmile programme showed a convincing return on investment with respect to oral health improvement, reduced treatment needs and, importantly, a lowering of dental care

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- Oral health prevention programme for nursery and primary school children up to age 7
- Targeted at schools and nurseries in disadvantaged areas
- Encourages supervised daily tooth-brushing and twice yearly fluoride varnish application
- Provides toothbrush and fluoride toothpaste packs to reduce inequalities
- Encourages a visit to the dentist before a child's first birthday
- Signposts children with active tooth decay to primary care dental services

Figure 1 Designed to Smile principles.

under general anaesthetic.[5] The greatest impact on caries reduction is seen in children living within the most deprived quintile, showing an inverse social gradient across all quintiles particularly when participation is maintained over more than one school year.

Toothbrushing programmes have the greatest impact in schools that embrace the philosophy that it is improving both children's health and social skills, alongside educational attainment. Gaining headteacher backing is fundamental, as children enjoy participating and parents report that toothbrushing at school had increased their children's awareness of oral health. However, it is the daily timetabled activity that is critical to success.

Formal oral health education within schools, delivered by trained educators, shows improved outcomes compared with control groups. These sessions need to be regularly reinforced with teachers and caregivers to maintain the benefit, as one-time sessions do not influence behaviour. Importantly, the encouragement of teachers and peers appear to be as effective as dentist-provided education sessions in improving oral hygiene practice, underlining the benefit of non-dentist engagement in oral health programmes.

While existing evaluations of multicomponent child oral health improvement programmes have primarily focused on the impact on caries prevalence and healthcare utilisation, there may be additional benefits of these programmes for siblings and family members.

ADVOCATING FOR ORAL HEALTH

As early childhood caries is preventable, it should be the collective ambition of health professionals to ensure every child grows up free from tooth decay. Paediatricians can support this ambition through awareness of the importance of frequent toothbrushing, offering advice within Delivering Better Oral Health guidance, prescribing non-sugar medications, timely signposting to local dental services and advocating for supervised toothbrushing schemes.

With finite funding, it is important that resource allocation is guided by values-based evidence and health economic modelling. All stakeholders involved with young children (healthcare and allied healthcare professions, paediatricians and educators) have a central role in supporting this prevention approach within a shared-care philosophy, along with population-based prevention programmes such as D2S.

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REFERENCES

1 Tsakos G, Watt RG, Guarnizo-Herreño CC. Reflections on oral health inequalities: Theories, pathways and next steps for research priorities. *Comm Dent Oral Epidemiol* 2023;51:17–27.
2 Peres MA, Macpherson LMD, Weyant RJ, *et al*. Oral diseases: a global public health challenge. *The Lancet* 2019;394:249–60.
3 Broomhead T, Baker SR. From micro to macro: Structural determinants and oral health. *Community Dent Oral Epidemiol* 2023;51:85–8.
4 Nic Iomhair A, Wilson M, Morgan M. Ten years of Designed to Smile in Wales. *BDJ Team* 2020;7:12–5.
5 Kidd JB, McMahon AD, Sherriff A, *et al*. Evaluation of a national complex oral health improvement programme: a population data linkage cohort study in Scotland. *BMJ Open* 2020;10:e038116.