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From victim blaming to upstream action: tackling the social determinants of oral health inequalities

Richard Geddie Watt

Department of Epidemiology and Public Health, University College London, London, UK

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Abstract – The persistent and universal nature of oral health inequalities presents a significant challenge to oral health policy makers. Inequalities in oral health mirror those in general health. The universal social gradient in both general and oral health highlights the underlying influence of psychosocial, economic, environmental and political determinants. The dominant preventive approach in dentistry, i.e. narrowly focusing on changing the behaviours of high-risk individuals, has failed to effectively reduce oral health inequalities, and may indeed have increased the oral health equity gap. A conceptual shift is needed away from this biomedical/behavioural 'downstream' approach, to one addressing the 'upstream' underlying social determinants of population oral health. Failure to change our preventive approach is a dereliction of ethical and scientific integrity. A range of complementary public health actions may be implemented at local, national and international levels to promote sustainable oral health improvements and reduce inequalities. The aim of this article is to stimulate discussion and debate on the future development of oral health improvement strategies.

Key words: oral health inequalities; social determinants

Richard Geddie Watt, Department of Epidemiology and Public Health University College London, 1-19 Torrington Place, London WC1E 6BT, UK
Tel: 020 7679 1699
Fax: 020 7813 0280
e-mail: r.watt@ucl.ac.uk

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A radical reorientation is required in oral disease prevention to achieve sustainable oral health improvements, and to reduce oral health inequalities, both between and within countries. The dominant oral health preventive model has evolved from the biomedical nature of dentistry, and an individual 'risk factor' focus of much of clinical oral epidemiology. It is increasingly recognized that this approach alone will not be effective in achieving sustainable oral health improvements across the population, nor in reducing the oral health equity gap (1–6). More of the same approach is no longer an option. A paradigm shift is therefore needed away from the biomedical and behavioural approach to one which addresses the underlying social determinants of oral health through a combination of complementary public health strategies. It is 20 years since the Ottawa Charter was first published to provide a vision for improving population health (7). Although some progress has been achieved in implementing the Ottawa Charter to improve oral health, a great deal more still needs to be carried out.

Contemporary public health research has made significant strides in identifying the nature and causal pathways for health inequalities (8–11). In 2005, WHO launched the Commission on Social Determinants of Health (12). The 17 appointed Commissioners, all of whom are prominent figures in international politics, research and social action, will be making practical recommendations about how to improve health by acting on its social determinants. This is an important time for public health. Efforts to promote oral health need to be informed and linked with developments in the broad field of public health. It is therefore essential

that dental public health researchers and practitioners are informed and engaged in current discussions over health determinants, and the actions needed to improve population health. This article will critique current approaches to improving oral health and advocate the need for a more radical public health agenda. The extent and nature of oral health inequalities will be outlined, and the emerging evidence on the social determinants of oral health highlighted. The limitations of the dominant 'lifestyle' model will then be reviewed, and options for an alterative more progressive approach considered. Finally, challenges that need to be addressed to facilitate such a change in strategy will be described. It is hoped that this article will stimulate and provoke a lively discussion and debate on the future development of oral health improvement strategies.

Health inequalities

A major problem facing dental policy makers is the persistent and universal challenge of how to effectively tackle oral health inequalities. A substantial body of dental scientific literature from many countries has shown that the oral health of lower socioeconomic status (SES) groups is worse than the oral health of their higher SES counterparts (13–16). Despite significant overall improvements in oral health in recent decades across the developed world, social inequalities in oral health have remained. Even in countries with well-developed dental health care systems, and where community water fluoridation programmes exist, oral health inequalities, although less marked, still persist (17–21).

Inequalities in oral health mirror those in general health. Research into general health inequalities has shown a social gradient in morbidity and mortality levels (9, 11, 22, 23). Individuals at the top of the social hierarchy enjoy better health than those immediately below them, and as one goes down the social scale, health deteriorates further. The social gradient is consistently found for most common diseases and causes of death, and for all age groups, sex, race and countries (24–27). Inequalities in health between and within countries are, however, avoidable (28). Indeed, the slope of the social gradient in health varies, being less steep in more egalitarian countries such as Sweden where there are fewer inequalities in income and social position. Reducing the avoidable differences in health status can be seen as an issue of social justice (26).

As in general health, a social gradient in oral health also exists. Research in the United Kingdom, New Zealand, Chile and Australia indicate a social gradient in a range of clinical and self-report oral health outcomes (29–33). For example, Lopez and colleagues recently reported a social gradient in a range of periodontal disease outcomes in a large sample of Chilean high school students (32). They showed that all periodontal outcomes investigated followed a stepwise social gradient with paternal income and parental education being the most influential variables assessed. These results demonstrated that social inequalities in periodontal health were discernible along the entire spectrum of socioeconomic position, not just between the top and bottom of the social hierarchy. In a representative sample of Australian adults, Sanders and colleagues also showed an inverse linear gradient between an index of multiple deprivation and two oral health outcomes, self-reported missing teeth and Oral Health Impact Profile (OHIP-14) scores. The gradient for both oral health outcomes remained after adjusting for age (33).

Social determinants of health inequalities

If social gradients in general and oral health are universal, then the determinants of the gradient needs to be addressed. Effective action to tackle oral health inequalities can only be developed when the underlying root causes of the problem are identified and understood. Clinical, and indeed much of modern epidemiological research, has concentrated on the individual 'lifestyle' and biological risk factors, what is referred to as the 'downstream' factors in disease aetiology (34–36). Indeed, the dominant scientific approach in biomedical research has focused upon teasing out the molecular and genetic basis of disease at the micro level. Political factors support this individualistic approach in determining global research priorities, and a research climate that considers the macro level and, in particular, socioeconomic factors as 'too sensitive and political' (34). Baelum and Lopez have eloquently reviewed how the biomedical approach in research has heavily influenced theoretical understanding of periodontal disease, and of its limitations in explaining periodontal disease patterns at the population level (37).

An impressive body of evidence now exists to demonstrate the underlying influence of the

psychosocial, economic, environmental and political determinants of health inequalities (8–12). The universality of the social gradient indicates the overriding influence of the social environment or social context on health. The circumstances in which people live and work has a profound impact on their health and well-being (11). In certain cases, absolute deprivation has a significant impact on health status but the social gradient indicates the importance of relative deprivation (9). Relative deprivation relates to a broader approach to social functioning and meeting of human needs and capabilities (26). Various theoretical models have been developed to explain the causal pathways and processes linking the biological, psychosocial, behavioural, environmental and political determinants of health inequalities (11, 38–41). These theoretical approaches describe how social structure and social environments influence health behaviours, and the psychological and pathophysiological changes in disease processes over the life course. Health behaviours such as smoking are socially patterned, and demonstrate the profound influence of broader social factors on individual behaviours (42). Evidence from longitudinal studies highlights the effect of early life circumstances and experiences on later adult health. Life course analysis has shown how social advantage and disadvantage accumulates or clusters at critical periods, particularly in early life, thus contributing to the creation of health inequalities (43). The social determinants approach is essentially a rediscovery of population public health, and highlights the need to examine, and ultimately tackle the underlying *causes of the causes*, what is called the 'upstream' social conditions that give rise to the unequal distribution of death and disease in modern society (44).

Although research into the social determinants of oral health inequalities is less well developed than that in general health (45), various theoretical approaches have been developed in relation to oral health outcomes (13, 46–49). Certain models have considered oral health behaviour as a key construct in explaining oral health inequalities (13, 48), whereas others have adopted more of a social determinants approach in which they place greater emphasis on the role of social structure and the social environment in determining oral health outcomes (46–47, 49–51). For example, in their investigation of the determinants of oral health inequalities in an Australian adult population, Sanders et al. showed that dental behaviours (dental visiting and dental self care) accounted for little, if any, of the socioeconomic gradient in oral health (33). The authors concluded that 'if oral health promotion is to reduce social inequalities in adult oral health, efforts need to be directed to factors other than the dental behaviours of individuals. Rather than focus on individuals alone, the approach needs to achieve a better balance of targeting both individual level factors and also the social environments in which health behaviours of individuals are developed and sustained'. The propensity for risk behaviours to cluster again indicates that they are embedded in the social environments and conditions in which people live (52–53). Oral and general health behaviours have also been shown to co-occur among certain population subgroups (54).

Evidence is emerging on the important role of psychosocial factors in oral diseases (55). Research exploring the pathways between psychological stress and periodontal disease (56, 57), sense of coherence and oral health behaviours and outcomes (58, 59) and marital quality, work stress and oral health status (60) all support the role of these psychosocial factors on oral health. Oral health life course studies have provided useful insights into explaining oral health inequalities (61–65). For example, Nicolau and colleagues demonstrated how socioeconomic, behavioural, psychosocial and biological factors in early childhood affected oral health outcomes in adolescence (61–63). Oral health data from the Dunedin Multidisciplinary Health and Development Study in New Zealand showed that low paternal socioeconomic position was significantly associated with higher caries and periodontal disease experience at 26 years (64). A relationship was found between the rearing style of parents and the impact of oral problems in adulthood, indicating that childhood circumstances may play a role in the pathway to adult oral health by influencing psychosocial development (65). Early life circumstances certainly appear to have a major influence over adult oral health status. Further research is needed, however, to uncover in detail the causal mechanisms and pathways between early life and later oral health.

Public health behaviourism

In the HIV/AIDS field the limitations of focusing on individual risk factors as a means of addressing health inequalities has been termed *public health*

behaviourism (66). This term could, however, equally be applied to oral disease prevention which has been dominated for decades by an individualistic behavioural approach (67). The underlying assumption in this approach is that once individuals acquire the relevant knowledge and skills, they will then alter their behaviour to maintain good oral health. What are the problems with this approach in tackling oral health inequalities? The limitations of the individual 'lifestyle' approach have been reviewed in detail by several eminent public health researchers (36, 38, 68–69), and in brief the key limitations include the following.

Lifestyle approach is ineffective and costly

Results from sophisticated, well-designed community interventions in the United States, aimed at preventing heart disease through 'lifestyle' changes, reported very disappointing results (70–73). If these 'top of the range' interventions with multi million dollar budgets failed to achieve major health gains, what are the prospects for other less well resourced 'lifestyle' interventions? Reviews of the oral disease preventive literature have indeed highlighted the limitations of educational interventions to produce sustained improvements in oral health, or for reducing oral health inequalities (1–6). Indeed, dental health education programmes may actually widen oral health inequalities by benefiting middle class families more than their poorer contemporaries (74). Although very limited evidence exists on the cost effectiveness of oral health preventive programmes (4, 5), in many cases clinical personnel are heavily involved in delivering these interventions, hence increasing their costs considerably.

Victim blaming reductionism

Narrowly focused 'lifestyle' interventions which fail to acknowledge and address the underlying social determinants of health inequalities are 'victim-blaming' in nature. The social patterning of health behaviours (42) demonstrates the overriding impact of social structure and conditions in determining and sustaining smoking, dietary habits and other behaviours. 'Lifestyle' interventions assume individual behaviours are freely chosen and therefore can be altered through the provision of new information or development of health skills. Choices are, however, largely determined and conditioned by the social environments in which individuals live and work. Unless action is focused upon improving the social conditions that determine behavioural patterns, oral health inequalities will persist and indeed may widen (50).

Lack of a theoretical base

Many dental health education interventions lack a sound theoretical basis (1–5, 51). Those that are developed upon a theoretical model tend to utilize psychological theories of change (75). These theories and models have limited utility in explaining behavioural intentions (76, 77). Theories of the social determinants of health are more likely to have value in designing and implementing effective public health actions (51).

Divert limited resources away from upstream factors

The dominant 'lifestyle' approach in prevention may seem benign and apolitical in nature. However, this approach is heavily influenced by a political and professional doctrine emphasizing individual choice and responsibility as core policy values (34). Diverting limited resources 'downstream' away from the true aetiological factors determining population health is a highly politicized approach, and as such should be resisted by public health advocates (68).

Reorientation of dental public health

Before his untimely death, Dr Lee Jong-wook, Director General of WHO called for a reorientation in public health action and policy (12). He stated that 'interventions aimed at reducing disease and saving lives succeed only when they take the social determinants of health adequately into account.' According to Marmot 'if the major determinants of health are social, so must be the remedies.' (26). Wider social policy will therefore be crucial in reducing health inequalities. In a review of policies to reduce health inequalities across 13 developed countries, Crombie and colleagues identified the following policies: taxation and tax credits, old age pensions, sickness and rehabilitation benefits, maternity and child benefits, unemployment benefits, housing policies, labour market, social inclusion and care facilities (78). These policies should enable the healthier choices to be the easier choices. The most recent public health strategy in Sweden aims to create social conditions that will ensure good health for the entire population (79). Five key policy domains focus upon the social determinants of health inequalities: participation in society,

economic and social security, conditions in childhood and adolescence, healthier working life and environmental change. What does this mean for dental public health policy and practice?

Sick teeth, sick individuals and sick populations

The first and most obvious point is that a change in approach in oral disease prevention is urgently required. To not do so is a dereliction of our ethical and scientific integrity. The high-risk approach has dominated oral disease prevention as the inception of clinical prevention. This approach aims to focus attention on high-risk individuals who have been identified through screening. To be effective, the screening test must have an acceptable level of sensitivity, specificity and high predictive power. Once identified, the high-risk individuals at the tail end of the disease distribution are then offered preventive support to alter their 'diseased lifestyle'. This approach is popular with both clinicians and health educators who espouse the behavioural origins of dental diseases. However, from a public health perspective, this high-risk approach has many limitations (44, 45, 80, 81). According to Burt 'identifying and then targeting individuals at high risk is not a recommended strategy in public health because the risk assessment models are far from precise at individual levels, and there are practical problems in treating the identified individuals successfully' (45). The high-risk approach is palliative in nature: action is not directed at the underlying causes of disease, so new high-risk individuals will therefore constantly emerge because the conditions creating disease have not been altered. Although extensive resources have been directed to investigating sophisticated means of identifying high-risk individuals, the predictive power of available screening tests are limited. Indeed, the best available predictor of future caries is still past caries. Recently, Milsom and colleagues have assessed in detail the effectiveness of school dental screening in the United Kingdom on dental attendance and dental treatment received (82). They showed that the screening programme had minimal impact on dental attendance and treatment of carious permanent teeth and concluded that 'school dental screening also fails to address inequalities in the prevalence of untreated disease and utilization of dental services.'

Based upon Rose's original analysis of available approaches in preventive medicine (44), Baelum and Lopez have coined a useful expression, 'sick teeth, sick individuals and sick populations' (37). This phrase encapsulates the way in which diseased teeth are 'nested' in 'sick individuals' who are 'nested' within 'sick populations'. Senior public health policy makers at WHO have criticized the dominance of the high-risk approach that it has 'overshadowed the more important population approach' (83). In the population approach, social, economic and public health measures such as those advocated in Sweden (79) are implemented to reduce the overall level of risk in the whole population, shifting the whole distribution of the disease to the left. This more radical approach aims to address the underlying causes of disease across the whole population. Another option, known as the geographic targeting or directed population approach, involves focusing action on higher risk groups, communities or subpopulations. These groups or communities are not identified by screening methods, but instead epidemiological and/or socio-demographic data are used to define a particular subpopulation. Internationally, a growing consensus recognizes the limitations of solely adopting a high-risk approach in oral disease prevention, and now advocates the need for a combination of both population-based and high-risk approaches (37, 44, 45, 83–86).

Upstream actions to promote oral health

Sustainable improvements in oral health and a reduction in inequalities require action to address the underlying determinants of oral diseases. The central focus for action needs to be the creation of a social environment which facilitates and maintains good oral health across the population. Based upon WHO recommendations on public health policy (87), a set of guiding principles on developing oral health strategies is summarized in Table 1.

All too frequently preventive and dental health education programmes have been implemented in isolation from other health initiatives. This narrow and compartmentalized approach, which essentially separates the mouth from the rest of the body, has led to a duplication of effort, is wasteful of limited resources and can lead to contradictory information being given to an increasingly sceptical public. The common risk factor approach, in which coordinated action is focused upon a set of shared risk conditions and their associated behaviours, aims to address the common determinants of chronic conditions, including oral diseases (88–89). Rather than focusing on the separate diseases in

Table 1. Guiding principles on developing oral health interventions

Empowerment: interventions should enable individuals and communities to exert more control over the personal, socioeconomic and environmental factors that affect their oral health
Participatory: key stakeholders should be encouraged to be actively involved in all stages of planning, implementing and evaluating interventions
Holistic: interventions should adopt a broad approach focusing upon the common risks and conditions that determine oral and general health
Intersectoral: partnership working across all relevant agencies and sectors is essential to ensure that oral health improvement is placed upon the wider public health agenda
Equity: the need to focus action on addressing oral health inequalities should be of paramount importance in the planning of interventions
Evidence base: existing knowledge of effectiveness and good practice should be the basis for developing future oral health improvement interventions
Sustainable: achieving long-term improvements in oral health which can be maintained by individuals and communities is crucial
Multi-strategy: tackling the underlying determinants of oral health requires a combination of complementary actions such as healthy public policies, community development and environmental change
Evaluation: sufficient resources and appropriate methods should be directed towards the evaluation and monitoring of oral health interventions

isolation, the common risk factor approach adopts a more holistic style of working which facilitates health partnerships and coalitions. This approach is now widely advocated, but changing to it from the isolated and individualistic pattern of working for many oral health practitioners remains a challenge because of many organizational and administrative constraints (85).

Over 20 years ago, the Ottawa Charter highlighted the need for a range of complementary public health actions to promote population health (7). Healthy public policy, creating supportive environments, strengthening community action, developing personal skills and reorienting health services are all approaches that can be used to improve population oral health (86).

Useful insights for oral health improvement can be gained from the field of tobacco control where in many parts of the developed world significant success has been achieved. In an expert review of tobacco control policy across 28 European countries, the relative value of different policy options were considered and ranked (90). Out of a possible score of 100, the following points were allocated to each policy

- Price/taxation policy (30 points)
- Workplace/public space smoking bans (22 points)
- Overall tobacco control budget (13 points)
- Labelling/health warning (10 points)
- Tobacco dependence treatment (10 points)

Experience in tobacco control demonstrates the value of developing policy and environmental measures aimed at regulating the upstream 'manufacturers of illness', in this case the activities of the tobacco industry, rather than only focusing on behavioural and clinical preventive measures targeted at smokers. The WHO Framework Convention on Tobacco Control is a good example of how coordinated global action can be harnessed to address significant threats to health through the implementation of policy and regulatory measures (91). In stark contrast, a recent analysis of how the top 25 global food companies have responded to international recommendations on nutrition indicate that progress has been very slow indeed (92). A great deal more needs to be carried out to achieve the desired gains in this important area of public health.

A range of options to promote oral health across the spectrum of action from upstream to downstream approaches are summarized in Fig. 1. Healthy public policies, legislation, regulation and fiscal measures can all be utilized to promote oral health either at local, national or indeed international levels (Table 2). For example, nutrition and oral health guidelines can be used by institutions such as nurseries, schools, hospitals and workplaces to create an environment where healthy food and drink options are widely available and affordable (93). Internationally, the Health Promoting Schools (HPS) initiative has emerged as an effective way of promoting the health of young people (94).

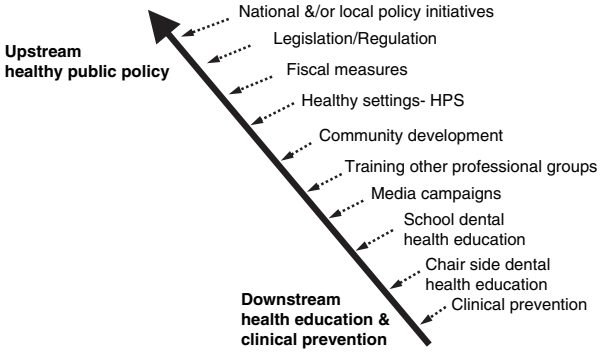

Fig. 1. Upstream/downstream: options for oral disease prevention.

Table 2. Examples of local and national upstream actions to promote oral health

Local level
Encourage schools to become part of the Health Promoting Schools Network
Develop oral health and nutrition policies in preschools and nurseries
Encourage sales of subsidized toothbrushes and toothpastes through community clinics
Encourage nurseries and schools to provide subsidies on healthy snacks and drinks
Encourage the engagement of community action groups in oral health projects
Support development of local infant feeding policies and ensure oral health messages included
Encourage development of oral health policies in older peoples residential homes and care centres
National level
Support regulation on content and timing of television adverts promoting children's foods and drinks
Encourage tighter legislation on food labelling and food claims on products
Encourage greater availability of sugar-free paediatric medicines
Support removal of VAT and other taxes on fluoride toothpastes and toothbrushes
Support legislation on water fluoridation
Support food and nutrient standards for school meals, and other foods and drinks sold in schools
Encourage safety standards for school play areas and other leisure facilities
Support legislation on wearing of seat belts, helmets and mouth guards

The concept of the HPS places emphasis upon developing a range of complementary policies and actions that create a health-promoting environment for students, staff and the wider community. Evaluation of HPS initiatives has demonstrated significant gains in a range of oral health outcomes including dental caries and dento-facial injuries (95–96).

A collection of national oral health strategies has been published in recent years to guide oral health practitioners in their efforts to promote oral health and reduce inequalities. Because of political and professional pressures, these strategies, in many cases, have tended to adopt a conventional and 'safe' approach in what they have advocated. In England, a more progressive approach has now been adopted in which a perspective based on determinants and population health emerges strongly (97). *Choosing Better Oral Health* (CBOH) links directly with the existing general public health policy framework in England. The CBOH policy outlines the need to address the determinants of oral health through the adoption of a common risk factor approach. The roles and responsibilities of key stakeholders are identified across a range of complementary actions. Greater emphasis could have been placed upon policy actions, and because no new resources were earmarked for the implementation of the strategy, it is unclear how much progress will be made in moving the agenda forwards. However, compared to the previous oral health plan for England, significant progress has been made in theory and policy terms in reorienting oral disease prevention to the main determinants.

Future challenges for improving population oral health

A range of challenges need to be tackled before significant progress is likely to be achieved in reorienting dental public health practice and policy towards a social determinants model. Although many talk about partnership working and claim to have established links with other professionals and agencies, too many dental public health practitioners remain isolated and detached in their working practices. At this crucial time of development in public health, closer collaboration and indeed integration of dental public health activities, needs to occur. However, many dental public health practitioners, policy makers and researchers have been trained in a bio-medical and behavioural paradigm, and fail to understand the philosophy underpinning the social determinants agenda. Building up suitable capacity among the dental public health workforce of personnel trained in a social determinants and population strategy framework is therefore a key priority. A need also exists for better co-ordination of efforts, both within and between countries. All too often encouraging results from innovative interventions are not disseminated to the appropriate groups. Sharing examples of good practice, or even lessons learnt from unsuccessful interventions, need to be shared and disseminated across the global dental public health community. The commonality of the challenge necessitates a more co-ordinated approach. International organizations such as WHO, IADR or FDI have important roles to play in disseminating resources and collective experience.

In terms of research, major gaps remain in our understanding of the social determinants of oral health and in particular of inequalities. The detailed nature and causal pathways linking

biological, psychosocial, behavioural, environmental and political determinants of oral health inequalities need to explored and researched in much greater depth. Rigorous, high-quality intervention studies need to be conducted and evaluated to identify effective measures to tackle oral health inequalities.

Conclusion

Action to reduce oral health inequalities remains a major dental public health challenge. A substantial body of evidence has shown the poorer oral health of lower SES groups compared with their higher social status counterparts. Recent research has highlighted a social gradient across the social hierarchy for a variety of oral health outcomes. Effective action to tackle oral health inequalities can only be developed when the underlying causes of the problem are identified and understood. Public health research into the social determinants of health inequalities has identified causal pathways linking the biological, psychosocial, behavioural, environmental and political factors to health and disease outcomes. Emerging evidence is beginning to map out the social determinants of oral health inequalities. Rather than implement narrowly focused preventive and educational 'downstream' interventions, future 'upstream' action is needed to create a social environment that supports and maintains good oral health. A range of complementary public health actions can be implemented at local, national or international levels to promote sustainable oral health improvements. A radical change in approach is needed. More of the same is no longer an option.

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