

# Policy solutions for oral health inequalities

Edited by Marco Peres and Richard G Watt

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# Introduction

*Marco Peres & Richard G Watt*

**O**VER RECENT YEARS the oral health research community has been very successful at documenting the public health significance of oral diseases around the world. We now have high quality evidence on the global burden of oral diseases in terms of their prevalence, impact and costs to society. A considerable body of research has also highlighted the nature and extent of oral health inequalities. Epidemiological data from across the globe has highlighted the social patterning of oral conditions. The universal social gradient in oral health exists across the life course in diverse and varied populations around the world. Informed by World Health Organization (WHO) theoretical frameworks, researchers are increasingly exploring the underlying social determinants of oral health inequalities to identify potential opportunities for intervention.

It is now widely acknowledged that dental treatment and clinical prevention have a limited impact in tackling oral health inequalities and indeed may actually widen inequalities. Limited progress has however been made in developing and evaluating upstream interventions to address the underlying causes of oral health inequalities. It is clearly essential that future interventions are informed by relevant theoretical frameworks and also are linked to the broader public health policy agenda. Adopting the common risk approach is more than just adopting downstream clinical interventions such as smoking cessation interventions in clinical settings – it is fundamentally about integrating oral health across all relevant policies. For example, increasing public health interest in sugar reduction provides a wealth of upstream, midstream and downstream policy opportunities for oral health professionals to integrate oral health into the broader NCD agenda. How we ensure that (oral) health inequalities are successfully tackled in sugar reduction policies remains a major challenge.

**The International Centre for Oral Health Inequalities Research and Policy (ICOHIRP) was formed in 2013 and over the last four years has successfully raised the profile of oral health inequalities amongst academics, policy makers and clinicians across the globe.**

In May 2015, a launch conference took place in London which brought together over 150 participants from more than 20 countries to discuss the way ahead in tackling oral health inequalities. Quarterly ICOHIRP seminars have also been held in London with a wide range of high profile public health researchers and policy makers presenting their work. The ICOHIRP has also been very successful in engaging with professional groups including the British, Japanese and German Dental Associations. For example, in May 2017, the ICOHIRP held an interesting policy seminar in Berlin in partnership with the German Dental Association. ICOHIRP members have also been actively working with colleagues from the WHO, FDI (World Dental Federation) and International Association for Dental Research (IADR) to raise the health inequalities agenda.

On 24 September 2017, for the first time outside Europe, the Australian Research Centre for Population Oral Health (ARCPOH), at The University of Adelaide, an institutional founder member of ICOHIRP, hosted a one-day conference in Adelaide, South Australia. The aim of this conference was to assemble a group of multidisciplinary researchers, health professionals, students and policy makers and together present the ‘state of the art’ of Policy solutions for oral health inequalities. A selected group of invited speakers from Australia, UK, New Zealand and Brazil, with different backgrounds including population oral health and public health research, sociology, social science, epidemiology and health economics critically presented the best evidence on societal determinants and common risk factors approach, the role of health services and systems, the political economy of oral health inequalities and the role of place and race on oral health inequalities. This second ICOHIRP monograph presents an overview of the excellent presentations delivered in Adelaide. Across the day a cohesive range of outstanding presentations critically summarised the current state of knowledge on (oral) health inequalities and highlighted policy solutions to tackle the persistent socioeconomic inequalities in health.

# Addressing oral health inequalities - where do we stand?

Richard G Watt

## Introduction

**F**OR MANY DECADES scientific evidence has been mounting describing the nature and extent of oral health inequalities across the globe. Unfair, unjust and unacceptable differences in oral health status persist and in many settings are worsening. It is time for action to address this pressing public health challenge – we know what the problem is, we now need to deal with it.

This paper will use the Kingdon analytical framework to argue that more attention now needs to focus on mobilizing civil society (social power) and engaging with decision makers and politicians to achieve meaningful policy change (political power) to reduce oral health inequalities (1). Kingdon, a US political scientist has argued that to achieve meaningful improvements in population health and health equity, we need to consider three key issues – communicate the nature of the *problem* to be solved, identify appropriate evidence based *policies* and engage with politics to achieve the desired change (1) (Figure 1).

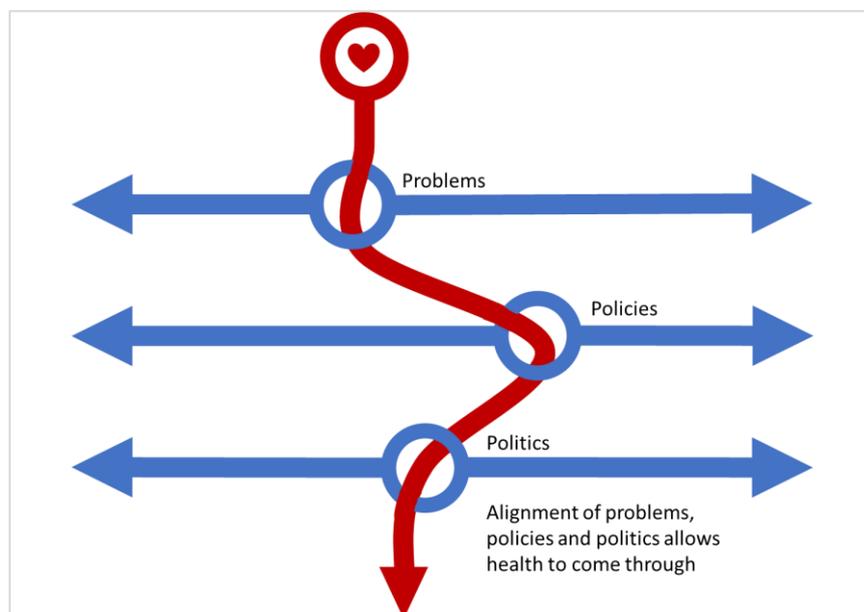


Figure 1: Modified Kingdon framework for policy making (Source Kingdon 2011)

## Problem - nature of oral health inequalities

In recent years major progress has been made in documenting the public health significance of oral diseases in terms of their high prevalence, significant impact on individuals and wider society and opportunities for preventive action. The WHO global burden of disease study has highlighted the prevalence of oral conditions across the globe (2) and increasingly the negative personal, social and economic impact of oral diseases has been convincingly demonstrated.

Oral diseases, just like other health conditions are socially patterned in society. Dental caries, periodontal diseases, tooth loss and oral cancers are all directly related to socioeconomic position in a stepwise graded fashion across the social hierarchy (3). Inequalities in oral health are a universal problem across the life course from early childhood to end of life, exist in diverse settings and affect populations in low, middle and high-income countries.

In addition to describing the nature and extent of oral health inequalities across the globe, significant progress has also been made in understanding the underlying causes of these inequalities, the social determinants of health inequalities. Solar and Irwin (4) have highlighted how health inequalities are

largely determined by patterns of social stratification arising from the systematic 'unequal distribution of power, prestige and resources in society'. Individuals from lower socioeconomic groups are born, live, work and age in less favourable circumstances than those from higher socioeconomic groups

We now have powerful evidence to demonstrate the public health significance of the problem of oral diseases and the nature oral health inequalities. What about the policy solutions needed to address this problem?

## **Policies – action to reduce oral health inequalities**

Dental treatment and clinical prevention are both important but have limited impact on reducing oral health inequalities. In addition, oral health education is key in improving oral health literacy but again has limited effect on tackling inequalities and indeed may increase, rather than decrease oral health differences in society (5, 6). Evidence reviews suggest that interventions to reduce health inequalities include (7, 8):

Structural changes in environment

Legislative and regulatory

Fiscal policies

Starting young

Community action

Prioritizing disadvantage population groups

There is a pressing need to improve the quality of the evidence base of these upstream interventions to determine the most effective and cost effective measures to tackle oral health inequalities.

## **Politics – engaging politicians in oral health action**

Clinicians, academics and public health professionals have limited direct control over the raft of policies that ultimately will influence population oral health. The key challenge is therefore engaging with civil society and both local and national politicians to ensure that the necessary actions are taken to promote population oral health and oral health equity – in other words, placing oral health in all policies.

Many health conditions such as cancers, cardiovascular disease and mental illnesses have successfully mobilized civil society through the formation of community advocacy groups and other third sector organizations. These groups have been highly influential in raising the public profile of their respective conditions and catching the attention of relevant decision makers and politicians. Unfortunately oral health has not received a similar level of public interest and engagement. Oral health professionals therefore need to raise the public profile of oral diseases through social media and other communication channels. Although rarely life threatening, oral conditions do have a profound impact on quality of life – future engagement with civil organizations needs to highlight these impacts to demonstrate the broader importance of oral health.

In terms of the political process, again oral health professionals need to place oral health on politicians agenda whenever relevant and appropriate. A useful narrative to engage local and/or national politicians is highlighting the social and economic impacts of oral diseases in society – the social and economic burden of oral diseases provides a powerful case for action. In addition the equity and rights agenda is a way of gaining political traction – the stark unfairness of disadvantaged preschool children suffering the acute pain associated with caries and experiencing the trauma of a

general anesthesia or neglected older people living in residential settings with oral infections, dental pain and unable to eat are nothing short of a scandal in modern society.

## Conclusion

Enough attention has been focused on describing and analysing the nature and extent of oral health inequalities. We know what the problem is, it is now time to take action. Mobilizing social power through the engagement of civil society and influencing politicians to make the necessary policy changes in state power are the key actions needed, in essence putting oral health in all policies.

## Policy implications

- Sufficient data has been analysed and presented on the nature and extent of oral health inequalities, it is now time for action to address this persistent and universal problem of fairness and social justice
- Current approaches to treating and preventing oral diseases are ineffective at reducing oral health inequalities
- Oral health advocates need to mobilize social power through engagement with civil society and community organisations to raise public awareness and influence future policy decisions
- Placing oral health in all policies requires political support from local and national politicians

## References

1. Kingdon JW. *Agendas, alternatives, and public policies*. Boston MA: Longman; 2011.
2. Marcenes W, Kassebaum NJ, Bernabé E, Flaxman A, Naghavi M, Lopez A, et al. Global burden of oral conditions in 1990-2010: a systematic analysis. *J Dent Res*. 2013;92(7):592-7.
3. Watt RG, Sheiham A. Integrating the common risk factor approach into a social determinants framework. *Community Dent Oral Epidemiol*. 2012;40(4):289-96.
4. Solar O, Irwin A. A conceptual framework for action on the social determinants of health. *Social determinants of health discussion paper 2. (Policy and Practice)*. Geneva: World Health Organization; 2010.
5. Government of Victoria. *Evidence-based oral health promotion resource*. Melbourne: Department of Health, Government of Victoria; 2011.
6. Public Health England. *Local authorities improving oral health: commissioning better oral health for children and young people*. London: Public Health England, 2014.
7. Macintyre S. *Inequalities in health in Scotland: what are they and what can we do about them?* Glasgow: MRC Social and Public Health Sciences Unit; 2007.
8. Bamba C, Gibson M, Sowden A, Wright K, Whitehead M, Petticrew M. Tackling the wider social determinants of health and health inequalities: evidence from systematic reviews. *J Epidemiol Community Health*. 2010;64(4):284-91.

### 1.1 Societal determinants of high sugar consumption

*Andrew Rugg-Gunn*

#### Introduction

**U**NDERSTANDING SOCIETAL DETERMINANTS of high sugar consumption is a really important step along the road to bring the population's consumption of free sugars down to levels recommended by WHO (1) and many national health authorities. First, high sugar consumption needs to be defined in order to examine the literature. A major difficulty is that few studies have specified 'free sugars' (as defined by WHO); some studies have listed 'added sugars' or 'non-milk extrinsic sugars' and these are nearly the same as free sugars (table 1). There is more research on societal determinants of purchase and consumption of sugar-sweetened beverages (SSB), which are a major source of dietary sugars, and more research still on fruit & vegetable (F&V) consumption: it has been necessary to expand the search for social determinants using these surrogates for high sugars intake. A moderately strong inverse relation between consumption of 'sugar' and F&V has been recorded in several studies. Sometimes 'purchase' has been recorded rather than 'consumption'.

#### Determinants of sugar consumption

At an intra- and inter-personal level, high sugars consumption has shown to be related to lower educational attainment and lower family income; with this research on 'socio-economic position' (SEP) coming from geographically diverse countries. Ethnicity is a determinant of high sugars consumption, particularly for new immigrants and particularly those from south Asia, and particularly affecting infants and young children (2).

The home environment is critical (3, 4); eating habits are forming and longitudinal studies have shown tracking of sugar consumption from childhood. The practice of eating meals is associated with healthier diets. Pre-schoolers in the USA were reported to watch an average of 4 hours of TV a day. TV advertisements and child pester-power are closely linked and results in purchase of high sugar products. Half of soft drinks are consumed at home, with SEP and TV viewing as important drivers of high purchase and consumption (5, 6). Higher consumption of SSB by children of low SEP mothers is likely to be mediated by parental intake of SSB and home availability of SSB.

#### School and community policy

School food policy is a really important issue (7). Not only is adolescence at time of high free sugars consumption, but we also know that diets track from adolescence to adulthood. School food policy should conform to national diet guidelines, covering meals provided in school (both nutrient and food guidance), as well as the contents of packed lunches, the contents of vending machines, and acceptance of sponsorship. In the UK, such a school food policy has been shown to not only improve diet within the school, but also the child's intake over the 24 hours.

In the wider community, in self-service cafés the order in which foods are offered and how far you have to go to get that food strongly influences choice (8, 9). In supermarkets, product pricing, product placement and 2-for-1 offers affect purchase. Nutrition ratings systems have been introduced into supermarkets, resulting in increased purchase of 'better' products and decreased purchase of nutritionally poor products. High-sugar items generally predominate at supermarket check-outs. Corner shops are associated with a high level of purchase of SSBs and they tend to exist in poor SEP areas.

## National policy

Moving now to consider national policies which encourage or discourage high sugars intake. First, agriculture policy. In many countries, production of sugar beet has been encouraged by subsidy and tariffs. Agriculture policy should facilitate national health policy not undermine it. Government can affect price of high-sugar drinks and foods by tax. High sugar drinks are now taxed in several countries (in place in France, Hungary and Mexico, and scheduled for Portugal, South Africa, UK), with price increase and purchase reduction being reported in Mexico. Advertising influences purchase (10). Governments have regulated to limit exposure of young children to TV advertisements of high sugar products, but the effectiveness of such regulations has become diluted by programme sponsorship, and much advertising is now on-line and through social media. Regulations aimed at encouraging healthy eating need to catch up with reality, and lack of ability to keep on top of advertising of products high in free sugars must be an up-stream risk.

A further way in which government can affect food choice is by labelling regulation, both nutrient labelling and front-of-pack labelling(11). In the UK, by far the most effective front-of-pack labelling has been traffic lights. High sugars content earns a red light. This is effective at influencing food choice but, very regrettably, in the UK, such labelling has been voluntary. Major sugar-related manufacturers did not like it and set up their own system, much diluting effectiveness. While nutrient labelling is compulsory for manufactured foods, inclusion of sugars is voluntary, resulting in manufacturers not listing sugars in their high sugars products. Also, this tends to be 'sugars' not 'free sugars'. Thus, weak labelling regulations are a risk for purchase and consumption of high sugars products. A further type of labelling is indicative labelling: in Europe, we have had a 'safe-for-teeth' logo applied, principally, to sugars-free confectionery, for some 30 years, to discourage purchase of high sugars confectionery by substitution.

Regrettably, 'war' must be added to the list of determinants, as national sugars consumption often decreases dramatically during time of conflict.

In summary, societal determinants of high sugars intake are many. As far as pathways are concerned, familial influences are strong but family members are influenced by circumstances and information they receive from the community and the media. Schools can affect food choice considerably, as can place of purchase of food, meals and snacks. The potential for government to influence purchase of healthier foods and discourage purchase of unhealthy foods is strong.

## Policy implications

- Research should focus on 'free sugars' consumption, as defined by WHO. This could be specified in research on SSB and F&V.
- Strong School Food Policies are essential, which conform with national nutrient and food intake guidelines. Pre-school and nurseries should be included within these regulations.
- Tax on high-sugars drinks and high-sugars discretionary foods, which increase price and decrease consumption, should be introduced. Money raised should be used to prevent dental caries as well as obesity.
- Effective 'traffic-light'-based front-of-pack labelling should be mandatory for manufactured foods/drinks. Labelling for 'percent of daily allowance' should be removed.
- National agricultural policy should favour and support national nutritional policy.

Table 1: Intake of free sugars, as g/d and as %Energy, for eight age-groups. Also given is the percentage of the population who obtained less than 10% of energy and less than 5% of energy from free sugars

Age	2-3y	4-8y	9-13y	14-18y	19-30y	31-50y	51-70y	71+y
Number	214	552	630	481	1523	2345	1792	666
Free sugars (g/d)	41	55	74	88	79	65	55	51
En from FS (%En)	12	13	14	15	13	11	10	11
"< 10% (%)	39	29	24	24	39	48	58	54
"< 5% (%)	6	4	2	3	10	11	15	9

Source: Lei L, Rangan A, Flood VM, Louie JCY. 2016. *Br J Nutr* 115: 868-877.

Data from the 2011-12 Australian Health Survey ( $n=8202$ ).

## References

1. Guideline: Sugars intake for adults and children. Geneva: World Health Organizations; 2015.
2. Vaitkeviciute R, Ball LE, Harris N. The relationship between food literacy and dietary intake in adolescents: a systematic review. *Public Health Nutr.* 2014;18(04):649-58.
3. van Ansem WJC, van Lenthe FJ, Schrijvers CTM, Rodenburg G, van de Mheen D. Socio-economic inequalities in children's snack consumption and sugar-sweetened beverage consumption: the contribution of home environmental factors. *Br J Nutr.* 2014;112(03):467-76.
4. Johnson BJ, Hendrie GA, Golley RK. Reducing discretionary food and beverage intake in early childhood: a systematic review within an ecological framework. *Public Health Nutr.* 2015;19(09):1684-95.
5. Mazarello Paes V, Hesketh K, O'Malley C, Moore H, Summerbell C, Griffin S, et al. Determinants of sugar-sweetened beverage consumption in young children: a systematic review. *Obes Rev.* 2015;16(11):903-13.
6. Hitchings E, Moynihan PJ. The relationship between television food advertisements recalled and actual foods consumed by children. *J Hum Nutr Diet.* 1998;11(6):511-7.
7. Niven P, Scully M, Morley B, Baur L, Crawford D, Pratt IS, et al. What factors are associated with frequent unhealthy snack-food consumption among Australian secondary-school students? *Public Health Nutr.* 2014;18(12):2153-60.
8. Kelly B, Freeman B, King L, Chapman K, Baur LA, Gill T. The normative power of food promotions: Australian children's attachments to unhealthy food brands. *Public Health Nutr.* 2016;19(16):2940-8.
9. Bucher T, Collins C, Rollo ME, McCaffrey TA, De Vlieger N, Van der Bend D, et al. Nudging consumers towards healthier choices: a systematic review of positional influences on food choice. *Br J Nutr.* 2016;115(12):2252-63.
10. Backholer K, Blake M, Vandevijvere S. Have we reached a tipping point for sugar-sweetened beverage taxes? *Public Health Nutr.* 2016;19(17):3057-61.
11. Waterlander WE, Zenk SN. Food labelling, food retail availability and food pricing - moving from research to action? *Public Health Nutr.* 2014;18(01):2-7.

## 1.2 Lessons from tobacco control: Population-wide strategies with social equity

Caroline Miller

### Introduction

**T**OBACCO SMOKING was the epidemic of the 20<sup>th</sup> century, a major threat to public health, and tobacco control has been a public health success story.

In the middle of last century smoking was ubiquitous in Australia, as well as in other Western countries. By the end of the second world war, three in four Australian men and one in four Australian women were regular smokers (1). Today smoking rates are the lowest ever recorded with one in eight Australian men smoke regularly (2). Uptake of smoking is declining with older (9%) and younger (3%) adolescent smoking rates (3).

Rising smoking and falling smoking rates have been influenced by opposing forces. There has been the systematic promotion, distribution, and glamorisation of smoking by the well-resourced, sophisticated multi-national tobacco industry. This, coupled with the highly addictive nature of tobacco lead to an increase in smoking rates. Then there was the subsequent emergent evidence that smoking kills, with the landmark 1964 US Surgeon General's report, through to our current knowledge that two in three long term users will die prematurely because of tobacco use (4). Scientists and medical authorities promoted this evidence, and the response has developed into a comprehensive public health response which we now call 'tobacco control' (5).

### History of tobacco control

In its beginnings, tobacco control was predominantly educative. A small group of doctors, health groups and religious groups promoted warning people about the dangers of smoking, encouraging quitting and trying to find ways to discourage children from experimenting with cigarettes. Advocacy was always important. Governments were pressured to reduce the wide scale promotion of tobacco. A discreet, faint warning that "smoking is a health hazard" first appeared on tobacco products in 1973. Direct tobacco advertising was banned from television at about the same time, but tobacco product marketing shifted to live sport sponsorship and print advertising. Quitting smoking was culturally equivalent to becoming a tee-totler or vegetarian, tobacco smoking was still allowed in public buildings, on aircraft, and tobacco company executives were given knighthoods for their services to the business community (5, 6).

In the early 1980s, Quit campaigns with paid televised campaigns were established in every state, professional PR strategies were used to popularise and promote a quit message. Governments began to seriously consider, and to enact from recommendations international health agencies to ban all forms of promotion of tobacco products, to mandate prominent health warnings, and to raise taxes on tobacco products with the dual objectives of making smoking less affordable and generating additional funds to fund quit smoking initiatives and also to replace tobacco sponsorship of sport. National helplines were established (known as Quitline), and education in schools was made routine (5).

In the 1990's, concern about passive smoking gained prominence and influenced public policy. It reframed the debate from one of 'personal choice/rights' and 'personal harm' to one of protection of citizens and led to progressively widespread restrictions on smoking in public places and workplaces (5).

### Defining elements of tobacco control

There are several defining elements to the approach that has been taken in tobacco control. Firstly, tobacco control takes a public health, or community-wide, approach. Secondly tobacco control has

always been underpinned by a very strong evidence base. Thirdly, tobacco control is a matter of health, but also economics and social justice.

Tobacco control has viewed tobacco as a threat to public health, which is propagated through community-wide and global promotion. Tobacco control's response has been in the same domain, with substantial mass-media quit smoking campaigns. Well-designed mass media campaigns are proven to increase quitting and reduce smoking rates in adults and young people. They prompt quitting, reduce the social acceptability of smoking and build public support for the implementation of other policies.

Education, including individually delivered and small group delivered education, has been an element of the approach in tobacco control, but it has been just that – one element. Recognition of the broader social and environmental drivers of health and health risk behaviours, has always been central. This has led to emphasis on the importance of regulatory interventions to create an environment that curbs the promotion of tobacco and reduces exposure to harm. This includes regulating the promotion of tobacco: on television, radio, in print, on outdoor signage, via sponsorship of sport, and at point of sale. It includes regulating the places where people can smoke.

Regulation influencing price, namely taxation, is a very important tobacco control measure. Increasing the rate of tax applicable to tobacco products allows governments to both reduce population consumption of tobacco and increase government revenue. The evidence for the effectiveness of tax and price policies is overwhelming (5).

Another important component of tobacco's control's approach is that it has worked within the domain of health, but not exclusively. Tobacco control has been successfully defined as a legal, economic, and social justice issue.

Smoking came to be understood not just a health issue but also a matter of consumer rights. Smokers and young people had a right, it was argued, to be informed about the health risks of smoking, as well as the addictive properties of nicotine. Smoking is also well understood as an economic issue. The direct and indirect health costs, and lost productivity associated with smoking related harm, underpins the case for government investment in smoking cessation interventions and mass media campaigns (5).

## **Smoking and social equity**

Reducing smoking is also a matter of social equity. Smoking rates have been substantially higher among groups who are educationally and socially disadvantaged. Smoking rates have been markedly higher among indigenous Australians, as well as among those living with moderate and severe mental illness, among people who are homeless, and those in correctional facilities. These groups have been identified as priorities and social marketing campaigns have been developed and tested to ensure that they influence lower-socio-economic groups. Reducing smoking, the personal and financial burden of health costs, financial stress, and intergenerational poverty associated with spending on tobacco products is a major social justice issue. Mainstream tobacco control interventions are designed and delivered with intent of reducing these disparities. Dedicated resources and interventions are also committed, notably in the case of Tackling Indigenous Smoking (5).

Smoking rates among those living in the most disadvantaged areas of Australia are unacceptably high and can be up to are double those living in the most advantaged areas. Nonetheless, smoking has declined in all socioeconomic groups over time; the absolute difference in smoking prevalence between the most and least disadvantaged has stayed fairly constant since 2004 (7). Victorian research has similarly found that the inequity gap in smoking appears to be narrowing, with the prevalence of regular smoking declining fastest among disadvantaged smokers in recent years (7).

Whether tobacco control strategies are as effective in reaching low socio-economic groups as they are in reducing smoking among more advantaged people, is central to tobacco control. There is robust evidence that population-wide strategies such as graphic anti-smoking advertisements and increases in taxes on cigarettes have reduced smoking across all socio-economic groups. Research in Europe concluded that tobacco control policies, both price and non-price related, have helped to reduce the

prevalence of smoking in the total population, particularly in lower socioeconomic groups. Such policies may therefore have contributed to a certain degree of narrowing in the gap between advantaged and disadvantaged groups (8). A recent review similarly concluded that increasing the price of tobacco through taxation policies and continuing anti-smoking mass media campaigns are the most effective strategies to reduce inequities in tobacco use (9). Controls on tobacco advertising, promotion, and marketing appear to be equally or more effective among disadvantaged groups (10).

## Policy implications

- Tobacco control is successfully curbing the greatest preventable burden of premature death and disability. Dietary risk is now overtaking tobacco.
- Tobacco control involves a comprehensive suite of interventions, and population-level interventions are central.
- Smoking rates are higher in disadvantaged groups, and tobacco also drives disadvantage.
- Tobacco control has targeted whole of population smoking rates, and simultaneously focussed on smoking in disadvantaged groups.
- This approach has yielded progress in all groups including the most disadvantaged.
- A population-level approach to public health threats, can successfully include a simultaneous focus on social equity.

## References

1. Woodward S. Trends in cigarette consumption in Australia. *Intern Med J.* 1984;14(4):405-7.
2. Australian Institute of Health and Welfare. National Drug Strategy Household Survey (NDSHS) 2016 key findings Canberra: AIHW; 2017. Available from: <https://www.aihw.gov.au/reports/illicit-use-of-drugs/ndshs-2016-key-findings/contents/summary>.
3. White V, Bariola E. Australian Secondary School Students' Use of Tobacco, Alcohol, and Over-The-counter and Illicit Substances in. 2011.
4. General S, editor *The health consequences of smoking – 50 years of progress: a report of the surgeon general.* US Department of Health and Human Services; 2014: Citeseer.
5. Scollo M, Winstanley M. *Tobacco in Australia: facts & issues:* Cancer Council Victoria; 2012.
6. Walker RB. *Under fire: a history of tobacco smoking in Australia:* Carlton, Vic.: Melbourne University Press; Beaverton, OR: International Scholarly Book Services; 1984.
7. Greenhalgh E, Scollo M, Pearce M. Are current strategies to discourage smoking in Australia inequitable? In: Scollo M, Winstanley M, editors. *Tobacco in Australia: Facts and issues.* Melbourne: Cancer Council Victoria; 2016.
8. Hu Y, van Lenthe FJ, Platt S, Bosdriesz JR, Lahelma E, Menvielle G, et al. The impact of tobacco control policies on smoking among socioeconomic groups in nine European countries, 1990-2007. *Nicotine Tob Res.* 2016:ntw210.
9. Purcell KR, O'Rourke K, Rivis M. Tobacco control approaches and inequity – how far have we come and where are we going? *Health Promot Int.* 2015;30(suppl\_2):ii89-ii101.
10. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: a systematic review. *Drug Alcohol Depend.* 2014;138:7-16.

For more information:

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### 2.1 Fluoride and oral health inequalities; childhood caries

*A John Spencer, Loc G Do, Diep Ha*

#### Introduction

**I**NEQUALITY IN CARIES is well established in most developed economies with children from lower socioeconomic status (SES) households experiencing more caries than those children from high SES households. Many national oral health plans call for a reduction in overall caries experience and inequality in caries experience by SES. Some possible interventions are aimed at reducing risk factors, others at increasing protective factors through fluorides.

#### Effectiveness of fluoride interventions

The efficacy or effectiveness of individual fluoride regimens varies. Fluoride regimens that maintain a low fluoride concentration at the tooth surface are preferred over those that have a periodic spike in fluoride concentration, suggesting a rank order of effectiveness. Even among those fluoride regimens with comparable efficacy or effectiveness, their impact on a community or population will be dependent on individual effort needed to obtain a benefit.

Frieden's health impact pyramid proposes an inverse relationship between individual effort needed to implement an intervention and community or population impact (1). Interventions which rely on changes to individual behaviour are generally less impressive in their outcomes at a population level (2). The social circumstances that constrain individual decisions and determine and stabilize behaviours resist individual behavioural change. These circumstances are the same as those that shape the social gradient in caries. Hence, the very circumstances that place low SES groups at greater likelihood of caries impede the population impact of fluoride interventions that rely on individual effort.

Hence, interventions involving fluorides can be placed into a Fluoride Impact Pyramid (Figure 2) based on the individual effort needed to obtain a benefit and potential population impact.

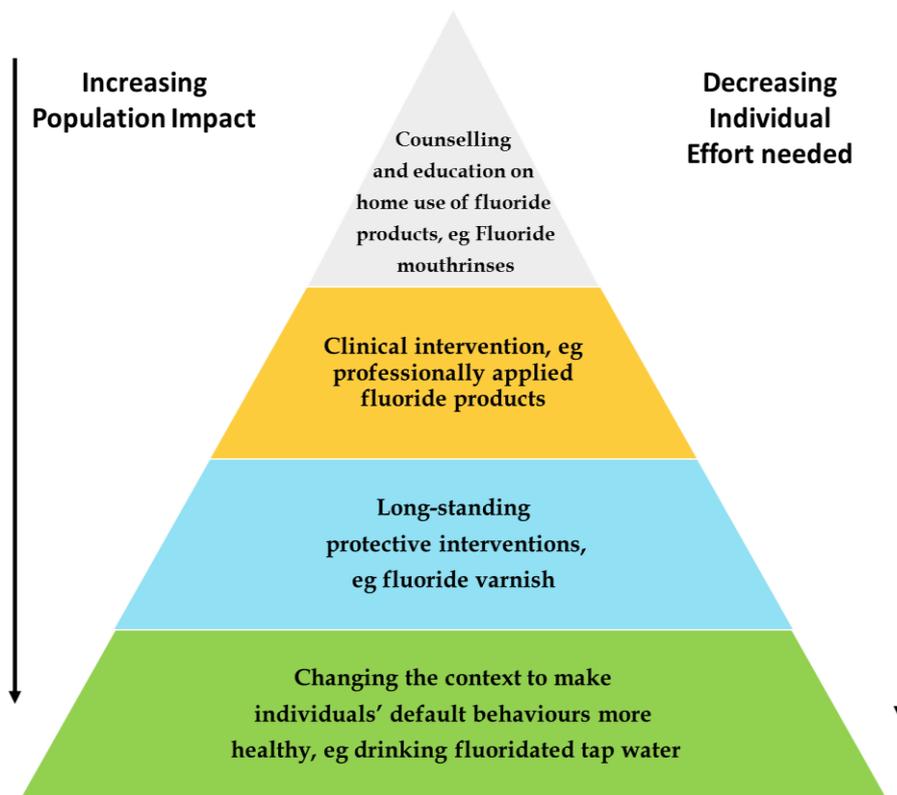


Figure 2: Fluoride Impact Pyramid

### Social distribution of fluoride interventions

The population impact of fluoride interventions on inequalities is also dependent on the social distribution of the uptake and intensity of the intervention. Interventions could be targeted or universal. A targeted intervention could aim to reduce caries only in lower SES sub-groups of the population. Most targeted interventions are well-intentioned demonstration programs in convenient settings. There is evidence that many can be effective in reducing caries, but usually no evidence exists as to whether such targeted programs have reduced inequalities across a population. Issues with a targeted approach predominantly lie with the requirement for system effort to sustain the intervention and difficulties in up-scaling.

Other interventions are universal. These could include fluoridated toothpaste or fluoridation of water or salt. While universal in availability, uptake and intensity might still be socially patterned. If the intervention requires individual effort, for instance brushing with a high fluoride toothpaste after a sustained social marketing intervention, the uptake of the behaviour may be greater among those whose social circumstances already promote tooth brushing. If the intervention applies a greater intensity among those whose social circumstances are damaging to their oral health, for instance reducing the cost of fluoridated toothpaste by removing certain taxes, the reduced cost may have a greater impact on consumer demand from low income households.

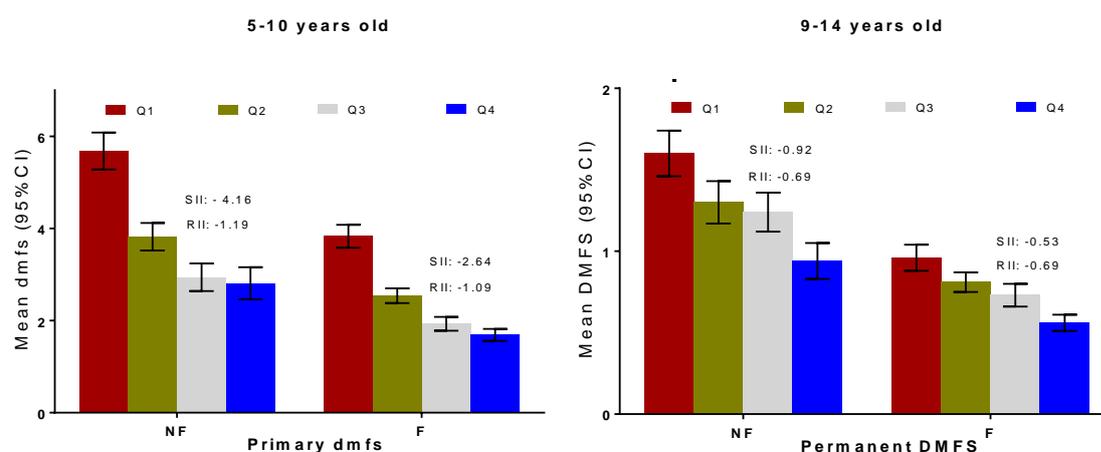
Thus, the outcome of fluoride interventions could be neutral, or they might increase or decrease inequalities in child caries, although measurement and interpretation of changes in absolute or relative inequalities is usually more complex (3).

### Evidence of fluorides reducing inequalities in child caries: water fluoridation

Two systematic reviews have explicitly addressed whether water fluoridation reduces inequalities in child caries. The York review (4) examined the evidence from UK based studies and concluded there was some evidence that it reduced caries measures in children. However, the more recent Cochrane

review (5), after applying harsher restrictions on the design of studies to be included, found insufficient evidence to determine whether water fluoridation results in a change in caries by SES. A recent Australian National Health and Medical Research Council (NHMRC) review (6) concluded that there was consistent evidence that water fluoridation reduces tooth decay across SES groups and that there was limited evidence that it reduces inequalities. However, NHMRC urged caution because of the limited number of studies, especially in the Australian context, and the low quality of studies and their varying results. There was a call for further high-quality research.

A national study of child oral health in Australia in 2012–14 (7) provides an opportunity to examine water fluoridation and income related inequalities. The outcomes presented in Figure 3 are primary caries experience (dmfs) of 5–10 year old children and permanent caries experience (DMFS) of 9–14 year old children by four equalized household income groups (EHI) between non-fluoridated and fluoridated areas (8). Caries experience was always greater in children in non-fluoridated areas. This supports universality. Absolute inequality (SII) in caries experience was greater in non-fluoridated than fluoridated areas. Relative inequality (RII) was similar. Inequality in child caries experience was reduced in fluoridated areas but not eliminated. A composite of additional targeted and universal fluoride interventions would be required to successfully eliminate child caries inequalities.



**Figure 3: Caries experience 5-10 year old (dmfs) and 9-14 year old (DMFS) Australian children by equalized household income quartiles (Q1 - low, Q4 - high) and water fluoridation status (NF – non-fluoridated, F – fluoridated)**

Water fluoridation delivers the same concentration or intensity of fluoride in the tap water supplied to households without any individual effort. A default behaviour, drinking tap water, becomes a positive preventive behaviour (9). The social distribution of fluoridated water is similar to the distribution of children by household income, but the intensity of the fluoride delivery, i.e. its concentration is not proportionate to the risk of caries. Yet, as some mechanisms of action of fluoride are related to the presence of sub-clinical caries activity, water fluoridation may favour a proportionate effect for low SES groups (10). Universalism assists in establishing a benefit for the many. Proportionality in the effect of reducing caries is consistent with social justice and equal opportunity for children.

## Policy implications

- Interventions using fluoride vary in population effectiveness depending on their need for individual effort.
- Fluoride interventions may be neutral, increase or decrease absolute and/or relative inequalities depending on the social distribution of their uptake and intensity.
- Recent findings show that water fluoridation reduces absolute inequalities in childhood caries, supporting social justice as a consideration in setting policy.

## References

1. Frieden TR. A Framework for Public Health Action: The Health Impact Pyramid. *Am J Public Health*. 2010;100(4):590–5.
2. Gochman DS (ed). *Handbook of health behavior research 1: personal and social determinants*. New York, NY, US: Springer; 1997.
3. Harper SAM, King NB, Meersman SC, Reichman ME, Breen N, Lynch J. Implicit value judgments in the measurement of health inequalities. *Milbank Q*. 2010;88(1):4–29.
4. McDonagh MS. Systematic review of water fluoridation. *BMJ*. 2000;321(7265):855–9.
5. Ihezor-Ejiofor Z, O'Malley LA, Glenny A-M, Macey R, Alam R, Tugwell P, et al. Water fluoridation for the prevention of dental caries. *Cochrane Database of Systematic Reviews*: John Wiley & Sons, Ltd; 2013.
6. National Health and Medical Research Council. *Draft Information Paper: Effects of water fluoridation on dental and other health outcomes*. Canberra: National Health and Medical Research Council; 2017.
7. Do LG, Spencer AJ. *Oral health of Australian children: the National Child Oral Health Study 2012–14*: University of Adelaide Press; 2016.
8. Do LG, Ha DH, Jamieson LM, Peres M, Roberts-Thomson K, Spencer AJ. Water fluoridation and income-related inequalities in oral health of Indigenous and non-Indigenous Australian children. Submitted to *JDR Clinical and Translational Health*. 2017.
9. Mechanic D. The social context of health and disease and choice among health interventions. In: Brandt AM, Rozin P, editors. *Morality and health*. New York: Routledge; 1997.
10. Macdonald W, Beeston C, McCullough S. *Proportionate universalism and health inequalities*. Edinburgh: NHS Health Scotland. 2014.

## 2.2 The role of oral health services in addressing oral health inequalities

Martin Dooland

### Introduction



CTIONS TO ATTEMPT TO REDUCE INEQUALITIES in oral health have ranged from population strategies (such as water fluoridation) to targeted health education and health promotion (such as improving the availability of fluoride toothpaste). However, clinical oral health services also have a role. This discussion focuses on publicly funded dental services.

### Inequalities in dental caries – adults

Typically in Australia, adults from a number disadvantaged backgrounds have more dental caries than the rest of the community. In the context of this analysis, adults from two ‘disadvantaged’ groups will be considered. These groups are:

- Those who are eligible for publicly funded dental care based on an income and assets test and
- People who report that they consider themselves to be "Indigenous"

In developing strategies to reduce this inequality, it is important to look into the components of the DMFT index to guide clinical priorities (Table 2). The age group 35–54 years for adults is selected to reduce the confounding effect of edentulism on the analysis.

The inequalities in untreated caries (D) and teeth missing due to pathology (M) are far greater than the inequality in total caries severity (DMFT) whereas the number of filled surfaces is lower among “eligible” and “indigenous’ adults than for the rest of the community.

**Table 2: Dental Caries in dentate 35–54 year olds, Australia 2004–2006(1)**

	D surfaces	M teeth	F surfaces	DMFT
Eligible	1.8	5.1	21.9	15.4
Non-eligible	0.7	3.7	24.9	14.2
% difference eligible to non-eligible	+157%	+38%	-12%	+8%
Indigenous	4.1	6.6	15.9	15.8
Non-indigenous	0.8	3.9	24.5	14.3
% difference indigenous to non-indigenous*	+413%	+69%	-35%	+10%

(eligible-non-eligible)\*100/(non-eligible) and (indigenous-non-indigenous)\*100/(non-indigenous)

Dental providers need to consider how much impact they can have on these inequalities, within the available resources, through:

- Primary preventive services to reduce the total caries experience in the disadvantaged groups
- Early intervention treatment to reduce untreated caries and tooth loss

## Inequalities in dental caries - children

There are also significant inequalities in dental caries levels between children from different social backgrounds. However, the components of dental caries experience show important differences from adults (Table 3).

**Table 3: Dental caries in deciduous teeth among Australian children aged 5-6 yrs (2)**

	<b>d (surfaces)</b>	<b>m (surfaces)</b>	<b>f (surfaces)</b>	<b>dmfs</b>
Low income	2.6	0.5	1.2	4.3
middle income	1.1	0.2	0.9	2.2
High income	0.6	0.1	1.1	1.3
% difference* Low to high income	+333%	+400%	+9%	+231%
Indigenous	3.4	0.8	1.1	5.9
Non-indigenous	1.2	0.2	0.9	2.5
% difference *indigenous to non- indigenous	+183%	+300%	+22%	+136%

\*(low income-high income)\*100/(high income) and (Indigenous-non-indigenous)\*100/(non-indigenous)

Children from low income or indigenous backgrounds show both elevated total dental caries experience (as measured by dmfs) as well as increased levels of untreated disease (d) and missing deciduous teeth (m). This reflects higher levels of underlying disease prevalence as well as less timely dental treatment.

Dental services will need to develop a suite of interventions that include both primary and secondary prevention.

### Characteristics of dental treatment programs

The nature of the treatment available to disadvantaged groups is likely to affect inequalities. For instance, reliance on problem-based dental visiting rather than regular check-ups is associated with poorer oral health outcomes (3).

Public dental services for low income adults in Australia tend to give priority treatment to people with dental emergencies/problems. The resources left over after this treatment are generally insufficient to provide timely treatment of non-emergency patients and waiting lists are established for these patients.

However, it is almost a cliché of health promotion that policy needs to make 'healthy choices the easy choices'. Yet the net effect of policies of priority for dental problems is to train disadvantaged groups to adopt an unfavourable pattern of dental care (i.e. problem-based visiting) while making timely check-ups and early dental treatment the least accessible. These approaches are probably widening the oral health inequalities in dental caries.

Many dental treatment programs include patient co-payments for the dental treatment. It is important that these co-payments do not reward problem-based visiting or suppress the seeking of check-ups and early treatment. For example, it may be better to have higher co-payments for problem-based visits with reduced or no co-payments for check-ups, preventive services and simple treatments.

Through its annual "Yearbook" South Australian public dental services have reported significant increases in the provision of non-emergency dental services for eligible adults through demand management strategies to suppress problem based visiting among eligible adults and increase the provision of check-ups and early interventive treatment (4).

Simply making timely dental care available to disadvantaged groups does not mean that the service will be accessed. For example, Indigenous people in Australia frequently report that they do not find mainstream dental services culturally sensitive (5). Significant efforts are likely to be needed to bridge

this gap. Similarly, disadvantaged groups have experienced many years of poor access to regular dental care and active programs to attract people to these clinical services are likely to be needed. South Australian public dental services have reported significant increases in the numbers of Indigenous people receiving publicly funded dental care through a liaison program with Indigenous communities and the removal of treatment co-payments (6). The oral health outcomes of these measures will be assessed as part of the forthcoming National Study of Adult Oral Health.

## Policy implications

- Dental Services need to apply evidence to develop suites of cost effective interventions for targeted disadvantaged groups that reflect both differences in underlying dental disease rates (primary prevention) as well as differential access to timely dental care (secondary prevention).
- Programs of dental treatment should be examined to ensure that they support desirable patterns of dental care (regular check-ups) rather than problem-based visiting.
- Active programs to seek out and treat disadvantaged groups are likely to be needed.
- Without additional funding of dental care for disadvantaged groups, reductions in inequalities in oral health are likely to require difficult decisions about clinical priorities. This challenge reinforces the importance of involving the full dental workforce in clinical strategies to reduce oral health inequalities.

## References

1. Roberts-Thomson K, Do L. Oral health status. In: Slade LG, Spencer AJ, Roberts-Thomson K, editors. Australia's dental generations: National Survey of Adult Oral Health 2004-2006. Canberra: Australian Institute of Health and Welfare (Dental Statistics and Research Series No. 34); 2007. p. 81-137.
2. Ha DH, Roberts-Thomson KF, Arrow P, Peres KG, Do LG. Children's oral health status in Australia, 2012-14. Oral health of Australian children: The National Child Oral Health Study 2012-14: University of Adelaide Press; 2016. p. 76-142.
3. Spencer J, Harford J. Improving oral health and dental care for Australians: University of Adelaide; 2008.
4. Government of South Australia. SA Dental Service Year Book 11-12. 2013.
5. Williams S, Jamieson LM, MacRae A, Gray C. Review of indigenous oral health [internet] [29/7/2017]. Available from: <http://healthinfolnet.ecu.edu.au/other-health-conditions/oral/reviews/our-review>.
6. Government of South Australia. SA Dental Service Year Book 14-15. 2016.

## 2.3 Challenges in demonstrating the value of successful oral health interventions

Jonathan Karnon

### Introduction

**T**HERE IS CLEARLY SIGNIFICANT room for improvement in the oral health of all populations, but should we spend more public money on oral health? Increased public funding of oral health interventions is likely to displace non-oral healthcare spending, and so the question might be reframed as do oral health interventions generate more highly valued outcomes than those generated by displaced health care?

This is same question that should be asked when any new and more expensive form of health care is introduced. It is not universally asked, but it is asked. To compare outcomes across interventions used to treat different conditions, health economists developed the Quality Adjusted Life Year (QALY). One QALY represents the equivalent of one year of life lived in perfect health.

As illustrated in Figure 4, quality of life weights are used to quality adjust life expectancy. A quality of life weight of zero is equivalent to being dead, a weight of one represents perfect health and values between 0 and 1 are interval measures, for example, values of 0.4 and 0.8 are 40% and 80% of perfect health. A person who spends two years with a quality of life weight of 0.8 gains 1.6 QALYs over that two-year period.

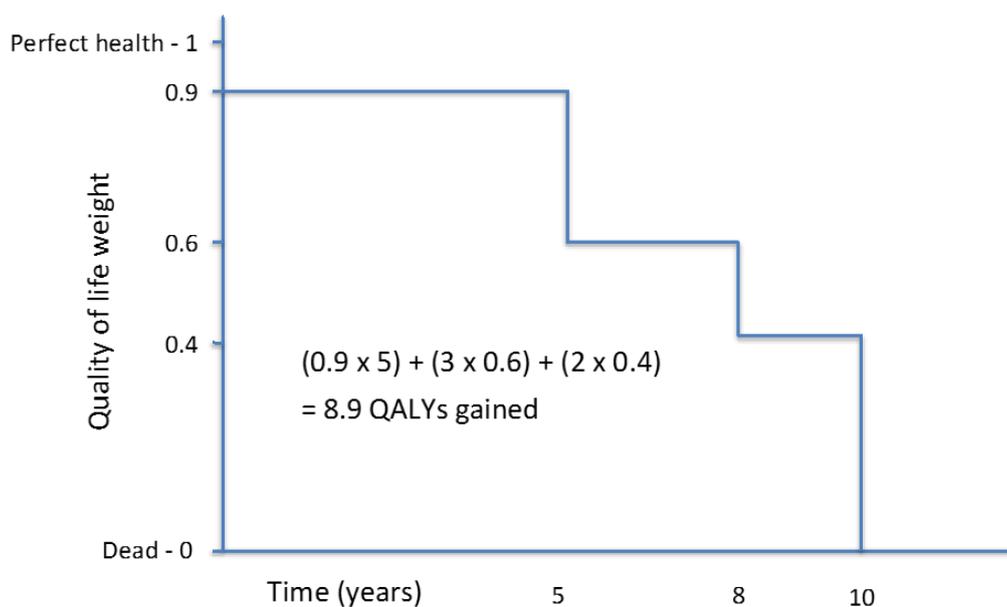


Figure 4: The QALY concept

Quality of life weights are most commonly generated by describing health as a function of multiple dimensions of health. The most frequently used instrument – the EQ5D – has five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression, with five levels for each dimension, ranging from no problems to extreme problems. Taking all possible combinations of levels, the instrument represents 3,125 alternative health states. Quality of life weights have been estimated via large surveys of the general population.

To inform funding decisions, economic evaluation describes the incremental costs and QALYs of a new health technology compared to current practice for a specified health condition. In Australia, we have estimated that the benefits of a new technology outweigh its opportunity costs of it gains additional QALYs at an incremental cost of less than \$28,000(1).

## Oral health interventions and QALY

So how do oral health interventions fare when evaluated using the QALY as a measure of outcome? Studies of water fluoridation show cost savings and huge QALY gains(2). The QALY has been used to evaluate orthognathic treatment for the management of dentofacial disharmony and for screening for oral cancer(3), but only one evaluation of dental care was identified, a recent English evaluation of a blended dental contract in which 40% of the contract value was linked to quality measures, including oral health improvements(4). The new contract showed an improvement of 1.65 points on the Oral Health Impact Profile-14 instrument (less than the specified minimally important difference of 5 points) and no difference in quality of life using the EQ5D instrument. Another study used an alternative generic quality of life instrument developed for use in children – the CHU9D – in New Zealand(5). Children who presented with caries had lower quality of life scores, but the effect was small, a difference of 0.01 on the 0 to 1 dead to perfect health scale.

## Modelling studies on oral health outcomes

Health economists have also undertaken modeling studies to estimate the longer-term costs and effects of dental care. A study of dental checks estimated that 6-monthly checks resulted in up to 1 fewer permanent tooth free from decay, fillings or extraction over 68 years compared to 3-yearly checks, at an additional cost to the patient of £47 (in 2003)(6). Converted to QALYs, such benefits may indicate that dental checks into adulthood are marginally cost-effective, but the high volume of dental checks likely precludes universal public funding due to the large budget impact. However, most governments and the societies they serve attach value to reducing inequities. Studies such as this may support the expansion of subsidized dental care to high-risk, low-income populations groups.

Noting the high estimated value of water fluoridation, population-based preventive oral health programs may also have potential to demonstrate value. Oral health education has been shown to be effective in improving oral health activities and outcomes, including reducing plaque, bleeding on probing of the gingiva and caries increment(7). At what cost?

There are significant challenges in demonstrating the value of oral health interventions, but the application of economic methods to their evaluation might best focus on two areas: the expansion of public subsidy for the provision of dental services to high-caries-risk, low-income populations and population-based preventive oral health programs. Such oral health interventions are most likely to generate health benefits at acceptable incremental costs in comparison to funding for non-oral health care. Combined with high potential to reduce health inequities, such economic evidence should provide a strong support for increased public funding of oral health interventions.

## Policy implications

- Expanded public funding of oral health interventions would displace public funding of non-oral health care.
- The same economic evaluation methods used to evaluate non-oral health care should be used to evaluate oral health interventions.
- Dental services for high-caries-risk, low-income populations and preventive oral health programs are most likely to generate health benefits at acceptable incremental costs, to reduce health inequities and to have manageable budget impacts.
- These factors will provide the best case for increased public funding of oral health interventions.

## References

1. Edney L et al. Estimating a reference ICER for the Australian health care system. *Pharmacoeconomics* (under review).
2. Ciketic S, Hayatbakhsh MR, Doran CM. Drinking water fluoridation in South East Queensland: a cost-effectiveness evaluation. *Health Promot J Austr.* 2010;21(1):51-6.
3. Tonmukayakul U, Calache H, Clark R, Wasiak J, Faggion Jr C. Systematic review and quality appraisal of economic evaluation publications in dentistry. *J Dent Res.* 2015;94(10):1348-54.
4. Hulme C, Robinson P, Saloniki E-C, Vinall-Collier K, Baxter P, Douglas G, et al. Shaping dental contract reform: a clinical and cost-effective analysis of incentive-driven commissioning for improved oral health in primary dental care. *BMJ open.* 2016;6(9):e013549.
5. Page LAF, Thomson WM, Marshman Z, Stevens KJ. The potential of the Child Health Utility 9D Index as an outcome measure for child dental health. *BMC Oral Health.* 2014;14(1):90.
6. Davenport C, Elley K, Salas C, Taylor-Weetman C, Fry-Smith A, Bryan S, et al. The clinical effectiveness and cost-effectiveness of routine dental checks: a systematic review and economic evaluation. 2003.
7. Nakre PD, Harikiran A. Effectiveness of oral health education programs: A systematic review. *Journal of International Society of Preventive & Community Dentistry.* 2013;3(2):103.

## 2.4 Political economy, trade relations and health inequalities: lessons from general health

Sharon Friel

### Introduction

**M**ACROECONOMIC POLICIES INFLUENCE the material and physical conditions in which people are born, grow, live, work and age. These ultimately affect how we feel and behave, and the acute and chronic suffering of disease and ultimately death (1). Trade liberalization is an integral part of most countries' macroeconomic policy, aiming to increase export and investment opportunities via trade and investment agreements (TIAs). Proponents maintain that this has resulted in higher average per capita incomes, and a diffusion of knowledge, services and technologies across borders, which have consequently improved health, labour and other living conditions (2, 3). Critics argue that the attendant gains in income have been uneven between countries and that some trade provisions restrict access to affordable medicines, and increase access to tobacco, alcohol, and ultra-processed foods – each of which is worrisome for oral health (4-6). Box 1 illustrates the many ways in which TIAs affect our everyday lives.

#### Box 1 - Living with trade liberalization

It is not unusual to start the day with generic vitamins produced locally without a patent protection while munching cereal that passed strict package labelling control, only to spend lunch-break at the dental clinic. At the clinic, a Filipino dental technician works with an X-ray machine imported from Germany, while the dentist prescribes a medication imported from the USA where it is produced under the patent protection. You return to the office while smoking a cigarette from a packet labelled with health warnings. On the way home, you stop for a Swedish massage (by a Swedish therapist) to improve circulation. Arriving home, you find last week's medical results (and a bill) that were transcribed and processed in India. You try to remember if your health insurance provided by an Australian-owned insurance company provides 75 or 80 per cent coverage. Settling down after dinner to watch a news programme on cable television, you catch an advertisement for reducing weight while being pampered in a luxurious resort and spa in Thailand. Immediately afterwards, the news begins with details about several more cases of avian 'flu and you cannot help but think how your government is unable to protect you from this disease.

Reproduced with permission from Mikic 2007.

#### How does trade and investment work?

While increased market access remains a key goal for export-oriented countries entering into TIAs, today's global economy is characterized by the use of global value chains (GVCs), via which different stages of the production process are conducted across different countries, and are typically coordinated by trans-national corporations (TNCs). Modern TIAs are explicitly aimed at supporting GVCs and TNCs. They typically provide strong investor protections; enable greater industry involvement in policy-making, and can require changes to domestic policies to enable, for example, regulatory coherence and harmonization. Such controls on government can limit the scope and mechanisms that they have to design and implement public policies that fulfil health goals (7). The most well-known example of this is the Australian Tobacco Plain Packaging case where the Australian parliament introduced laws that required the plain packaging of cigarettes in the interests of public health. Philip Morris (PM) and other tobacco companies first challenged this measure in the

Australian High Court and after losing the case there, PM lodged a dispute to be determined at international arbitration utilizing an investment dispute settlement clause found in a bilateral investment treaty signed by Australia and Hong Kong (7). The inclusion of investment protection clauses arguably privileges private rights over public interests and can lead to 'policy or regulatory chill' - discouraging governments from moving forward with policy measures, or encouraging them to hesitate while they await the outcomes of trade disputes (8).

## Unhealthy commodities

The rise in TIAs that include demands for alterations of domestic policy has also seen an increase in trade and investment in health-damaging commodities (particularly tobacco, alcohol, and high fat-, salt-, and sugary foods) (9). Across the Pacific Island nations, for instance, TIAs have undermined domestic agriculture and created a strong reliance on imports. This has led to high levels of fat consumption through cheap imports of margarine, butter, meat, chickens and canned meat (10). TIAs have enabled growing control over the food supply chain by transnational manufacturing, retail, and food service companies such as Pepsico, Carrefour and KFC (11). The upshot is the heavily marketed availability, affordability, and consumption of highly-processed foods (e.g. confectionery, fast food, and sugar-sweetened beverages) (11, 12).

## Policy implications

- Re-balancing industry influence in the trade negotiation process with input from the health sector is vital. Public health advocates and health policymakers must engage with trade negotiations to preserve policy space for public health goals.

## References

1. CSDH. Closing the gap in a generation: health equity through action on the social determinants of health. Final report of the Commission on Social Determinants of Health. Geneva: World Health Organisation, 2008.
2. Makki SS, Somwaru A. Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries. *Am J Agric Econ.* 2004;86(3):795-801.
3. Winters A. Trade Liberalisation and Economic Performance: An Overview. *The Economic Journal.* 2004;114:4-21.
4. Friel S, Hattersley L, Townsend R. Trade Policy and Public Health. *Annu Rev Public Health.* 2015;36(1):325-44.
5. Gleeson D, Friel S. Emerging threats to public health from regional trade agreements. *The Lancet.* 2013;1507-9.
6. Stiglitz JE. Trade agreements and health in developing countries. *The Lancet.* 2009;373(9661):363-5.
7. Koivusalo M, Schrecker T, Labonte R. Globalization and policy space for health and social determinants of health. Ottawa: University of Ottawa, 2008.
8. Lencucha R, Drope J. Plain packaging: an opportunity for improved international policy coherence? *Health Promot Int.* 2015;30(2):281-90.
9. Hawkes C, Murphy S. An overview of global food trade. In: Hawkes C, Blouin C, Henson S, Drager N, Dube L, editors. *Trade, Food, Diet and Health Perspectives and Policy Option: John Wiley & Sons Inc;* 2010.
10. Thow A, W Snowdon, . The effect of trade and trade policy on diet and health in the Pacific Islands. In: Hawkes C, Blouin C, Henson S, Drager N, Dubé L, editors. *Trade, Food, Diet and Health: Perspectives and Policy Options.* Oxford: Wiley Blackwell; 2010.
11. Baker P, Friel S. Transnational food and beverage corporations, ultra-processed food markets and the nutrition transition in Asia. *Global Health.* 2016;12(1):80.
12. Schram A, Labonte R, Baker P, Friel S, Reeves A, Stuckler D. The role of trade and investment liberalization in the sugar-sweetened carbonated beverages market: a natural experiment contrasting Vietnam and the Philippines. *Global Health.* 2015;11(1):41.

## Section 3: Political economy and (oral) health inequalities

### 3.1 The dental profession and advocacy

*Rob Beaglehole*



#### Introduction

**O**RAL HEALTH PROFESSIONALS are well placed to act as advocates. This article will highlight ways the oral health profession can use advocacy to reduce sugar, and sugary drink consumption in particular. Reducing sugar consumption across the population will ultimately lead to reducing other noncommunicable diseases (NCDs) as well as reducing oral health inequalities.

#### Sugary drinks and lessons from tobacco control

Strategies for tobacco control – taxation (1) advertising bans, sponsorship bans (2) and removing sugary drinks from settings such as hospitals, public spaces and schools (3) are powerful ways to reduce the consumption of sugary drinks. These actions have been successful in reducing tobacco consumption and where employed, have also helped to reduce sugar consumption.

#### Sugar – a common risk factor for NCDs & tooth decay

Sugary drinks are directly implicated in obesity, type 2 diabetes and a myriad of other NCDs, including dental caries. Oral health professionals, with their firsthand experience of the unnecessary pain and suffering that these drinks cause, are ideally placed to be involved in sugary drink advocacy. It makes sense for all of us working in the field of NCD advocacy to be targeting sugar, the common risk factor.

#### Health promoting settings: hospitals, councils and schools

With such a clear link between sugary drinks and tooth decay, obesity and type 2 diabetes, it is inappropriate for hospitals to be selling sugary drinks on hospital property. The Nelson Marlborough Hospital in New Zealand became the first hospital to ban the sale of sugar sweetened beverages (SSBs) after advocacy and discussion with the CEO in 2014 (4). This successful outcome had a domino effect and within 18 months, all hospitals in New Zealand had adopted similar policies.

Based on this success, the local Mayor and Council were approached with the suggestion that they follow suit with a SSB free policy. As a Council, such a policy aligned well with being a positive role model for the community they served. Again, leadership was key to the successful adoption of a SSB free policy where no SSBs are sold at Council premises, property or events (5). After a few more direct approaches to other Councils in New Zealand, a number have now also adopted SSB free policies.

Following the “settings” model, the next step in local advocacy action, was to encourage the local schools to initiate a water only policy in all school functions, sports trips and the annual school gala. Again, leadership by one principal provided a positive role model for other schools to follow suit. Subsequently, and on the back of national interest in sugary drinks and the damage they cause, the Ministry of Education encouraged all schools in New Zealand to consider adopting a water only policy (6).

### **Not to be ignored: juices and artificial sweetened beverages**

According to the World Health Organisation’s *Guidelines on Sugars*, juices (even 100% fruit juices) are classified as free sugars and as such should be treated like SSBs (7). With new and emerging evidence linking artificially sweetened beverages (ASBs) with weight gain and type II diabetes (8), as well as the acidic nature and subsequent erosion of teeth, the Nelson Marlborough Hospital modified their SSB free policy and removed sale of juices and ASBs on their premises – thus becoming a water and unflavoured milk only hospital. Many other hospitals are also realising the merits of such a policy because of the high sugar content in juice and the negative impacts of ASBs. ASBs may be free of calories but not of consequences.

Although tax is the hammer in the tool box of measures to reduce sugary drink consumption, other actions are also required. These include adherence to WHO’s recommendations on junk food marketing to children and advertising restrictions of junk food, water only policies at schools and public buildings (2). As with the removal of tobacco sponsorship of sporting events, another approach is to highlight the inappropriateness of sports stars being associated with sugary drinks. This has been done in New Zealand by calling out the All Blacks, our national rugby team, for accepting sponsorship by Gatorade.

Products that contribute to poor health have no place in settings and activities that are inherently about health, wellbeing and nourishment, particularly when the association sends mixed messages to children and adults.

### **Growing momentum – leadership, partnership & action**

Momentum against sugary drinks is gaining traction globally. Recently WHO released an important report on fiscal policies to reduce NCDs(1) which emphasised the value of taxes for reducing consumption of sugary drinks and subsidies to promote consumption of healthy foods, both of which can reduce oral health inequalities. At the same time, WHO adopted a sugary drink free policy at its headquarters in Geneva (9). Several regional offices of WHO have adopted similar policies, bringing true value to the mantra of “walk the talk”.

The technical report and the WHO sugary free policy highlight the urgent need for governments and other organisations (including national dental associations) to do all they can to reduce the pain, suffering and financial impacts these drinks are having on the population. Individual dentists (10) and dental associations around the world are beginning to stand up and speak out on the impact of sugary drinks. For example, the New Zealand Dental Association has launched a *Consensus Statement on Sugary Drinks* which outlines various measures to reduce sugary drink consumption (11).

The FDI World Dental Federation has also shown leadership in the area of sugar advocacy adopting a Policy Statement on free sugars and dental caries (12). FDI has also recently created a practical guide to reduce sugar consumption and curb the epidemic of dental caries (13).

Specific tools for engagement with the public and policy makers include effective use of social media, involvement with journalists resulting in extensive newspaper and TV coverage and partnership building with relevant stakeholders. These have proven to be vital ingredients for successful

advocacy campaigns such as the NZDA's Consensus Statement on Sugary Drinks, which has been endorsed by 14 health organisations.

## Challenges faced by advocates

Key challenges faced by those advocating for oral health promoting interventions are similar to the challenges faced by tobacco control advocates. A major issue is that public health advocacy confronts and questions cultural norms and threatens the status quo. Advocates may be ridiculed and targeted through social media by those working for the industry who will often use the term "nanny state" in their arguments promoting individual rights. It is a David versus Goliath situation.

## Policy implications

- Oral health advocacy needs to be integrated into other NCD advocacy strategies
- Common risk factor approach is required – sugar needs to be targeted
- Advocate for sugary drink free settings in the same way as tobacco free settings
- Taxation is a power tool to reduce sugar consumption
- National dental associations have a key role to play in advocacy

## References

1. World Health Organization. Fiscal policies for diet and prevention of noncommunicable diseases: technical meeting report, 5–6 May 2015, Geneva, Switzerland. 2016.
2. World Health Organization. Protecting children from the harmful effects of food and drink marketing. Features; 2014.
3. Thornley S, Marshall R, Reynolds G, Koopu P, Sundborn G, Schofield G. Low sugar nutrition policies and dental caries: A study of primary schools in South Auckland. *J Paediatr Child Health*. 2017;53(5):494–9.
4. NMDHB. Sugar Sweetened Beverages. Available from: <https://www.nmdhb.govt.nz/public-health-service/a-z-public-health-topics/oral-health/sugar-sweetened-beverages/>.
5. Nelson City Council. SUGAR SWEETENED BEVERAGES POLICY 2014. Available from: <http://nelson.govt.nz/assets/Our-council/Downloads/Plans-strategies-policies/2017/Sugar-Sweetened-Beverages-Policy-Amended-Nov2016-Approved-by-SLT-21Nov2016.pdf>.
6. Ministry of Education. Becoming a water only school 2016. Available from: <https://education.govt.nz/school/student-support/student-wellbeing/health-and-wellbeing-programmes/why-promote-healthy-lifestyles/>.
7. WHO. Guideline: sugars intake for adults and children: World Health Organization; 2015.
8. Imamura F, O'Connor L, Ye Z, Mursu J, Hayashino Y, Bhupathiraju SN, et al. Consumption of sugar sweetened beverages, artificially sweetened beverages, and fruit juice and incidence of type 2 diabetes: systematic review, meta-analysis, and estimation of population attributable fraction. *BMJ*. 2015;351:h3576.
9. World Health Organization. WHO's war on sugar. *Lancet*. 2016;388(10055):1956.
10. Beaglehole RH. Dentists and sugary drinks: a call to action. *J Am Dent Assoc*. 2015;146(2):73–4.
11. New Zealand Dental Association. Sugar Consensus Statement 2016. Available from: <http://www.healthysmiles.org.nz/assets/Final%20Consensus%20Statement%20on%20Sugary%20Drinks%20Jan%202017.pdf>.
12. FDI. Dietary free sugars and dental caries 2015. Available from: [http://www.fdiworlddental.org/sites/default/files/media/documents/3-fdi\\_ps\\_sugar\\_2015\\_hs.pdf](http://www.fdiworlddental.org/sites/default/files/media/documents/3-fdi_ps_sugar_2015_hs.pdf).
13. FDI. Sugars and dental caries: a practical guide to reduce sugar consumption and curb the epidemic of dental caries 2016. Available from: [https://www.fdiworlddental.org/sites/default/files/media/resources/sugar\\_toolkit-fdi-2016.pdf](https://www.fdiworlddental.org/sites/default/files/media/resources/sugar_toolkit-fdi-2016.pdf).

### 4.1 Addressing racial inequalities in oral health

João Luiz Bastos, Yin Carl Paradies

#### Introduction

**T**OGETHER WITH gender, sexuality, class, nationality, and other social categories, race has been at the core of much scholarly work not only in the area of humanities and social sciences, but also amongst a host of applied health disciplines. In the field of oral health, researchers and dental professionals have debated the use of race as a resource for clinical decision-making, (1) as well as a means of assessing inequalities in a range of outcomes, (2) including healthcare use/access, tooth decay, and periodontal disease. What is missing in these previous discussions, though, is a broader and consistent understanding of race, and how it could be interpreted in public health studies. This is not surprising, given that race has long been recognized as a particularly mutable category across time and space (3).

#### Racial inequalities in oral health

By conceptualizing *racial inequalities in oral health* as any difference in the frequency of oral diseases/outcomes between racial groups, we briefly reflect upon the use of race in oral health research, and make recommendations for future studies in the field. We view racial inequalities in oral health as essentially avoidable and unfair (i.e. health inequities (4)), as they stem from complex matrices of domination that include economic exploitation, social stigmatization, and political marginalization. Based on a broader and multidimensional concept (5) of race, we ask: 1) What is the prevailing theoretical framework amongst studies on racial inequalities in oral health?; 2) What can be learned and what is absent from the existing literature on the topic?; and 3) How can we enhance research and policy on racial inequalities in oral health? Our focus on oral health is backed by previous claims (2) that, while the field has recently incorporated new methodological approaches (e.g. multilevel modeling), robust theoretical formulations have yet to be extensively and rigorously used in explaining oral inequalities. We conclude with some policy considerations for addressing this type of racial inequity.

#### What is the prevailing theoretical framework amongst studies on racial inequalities in oral health?

While there is growing interest in understanding race from a broader multidimensional perspective, oral health researchers, dental professionals, and others responsible for the provision of oral health services usually draw from narrow definitions of race. There is ample literature on the links between race and oral health, such that systematically reviewing this scientific output is beyond the scope of the present analysis. Yet, simple tallies of publications indexed in one of the largest bibliographic databases – *Web of Science* – are suggestive of how race has been used and interpreted in oral health research. A search done on 7 September 2017 using the search terms “race” and “oral health,” “public health dentistry,” “oral pathology,” and “oral health promotion”<sup>1</sup> retrieves 4,391 publications. The bulk of studies come from the United States of America (USA), England, Brazil, and Canada, with 2,891, 154, 134, and 101 publications, respectively. When “race” is replaced with “racial discrimination,” only 42 studies are located, and as few as 33 papers are found when “race” is swapped for “racism.” Of note, merely three articles are found when “race” is replaced with “structural racism” or “systematic racism.” If we exclude duplicate results, the set of 59 papers

<sup>1</sup> The exact search query used was: TS=(race) AND TS=(oral health OR public health dentistry OR oral epidemiology OR dental public health OR dental health surveys OR oral surgery OR oral pathology OR periodontics OR oral diagnosis OR oral medicine OR oral surgical procedures OR oral health promotion OR dental care OR preventive dentistry OR dental health education).

derived from the last three search queries corresponds to roughly 1.3% of all those originally identified with the term “race.” Further inspection of these studies reveals only nine oral health investigations originating in Australia (n=3), USA (n=3), Canada (n=1), Brazil (n=1), and Spain (n=1); tooth brushing, toothache, tooth loss, oral health care use/access, and provision of specific dental exams/procedures are among the outcomes included in these publications.

The aforementioned bibliographic search is limited in that it does not effectively reveal how race has been used and interpreted in the field of oral health. On the other hand, these results do suggest that other relevant concepts (racial discrimination and structural racism, for example) have been hardly used in oral health research. What appears to be the prevailing theoretical framework in the field, then, is a narrow approach to race, for it does not explicitly recognize the broader historical and social processes to which it also refers (6, 7).

### **What can be learned and what is absent from the existing literature on the topic?**

While potentially limited in several respects, the existing literature on the topic has provided critical evidence on the distribution of oral health outcomes according to race. Drawing from other authors(8) and our own experience with research on health inequalities, we argue that knowledge gained from these studies has been useful in bringing to the fore some key features of the racial gaps in oral health: (1) with rare exceptions, racial minorities show the greatest burden of oral diseases, as well as restricted access to and use of oral health services; (2) although there is variation, the gaps between dominant and subordinate groups are large; and (3) racial health differentials persist over time.

Highlighting these ignominious aspects of racial inequalities in oral health is not enough, though, if narrow conceptions of race are used as a frame of reference. The problem arises when there is need to explain such inequalities and develop strategies to reduce them. Since narrow conceptualizations of race emphasize, more often than not, a short list of individual-level causes for racial health inequalities (mostly socio-economic status [SES], health behaviors, and genetic makeup), broader historical and social processes do not come into question. Based on uncontested associations between race and SES, researchers usually examine the extent to which individual SES explains the observed racial gaps in oral health. By so doing, scholars may be faced with at least two different scenarios. In some cases, they might conclude that the over-representation of racial minorities in lower socio-economic strata accounts for racial inequalities in oral health. In a number of instances, though, researchers might come across racial inequalities that persist even after adjusting for SES (9). Narrow conceptions of race would then point to other individual-level explanations for these inequalities, such as culturally shaped patterns of health behaviors or supposedly innate genetic differences. What would be absent from the existing literature on the topic, then, is a broader conception of race and its connection with upstream social determinants of health, for example, greater unmet need of minority populations (10).

### **How can we enhance research and policy on racial inequalities in oral health?**

Following Garcia, (5) as well as Phelan and Link, (6) we argue that race is linked to a range of broader factors that precede and shape SES, as well as other individual-level factors. Enhancing research and policy on racial inequalities in oral health thus has much to do with broadening the scope of race as a concept. A multidimensional perspective to race should take it as “a complex ‘assortment’ of distinguishing histories and specific life situations that bear on access, opportunities, differential treatment, and self-worth, which affects many facets of a person’s ‘lived experience’ as well as societal relationships and policies”(5). Social science scholarship indicates that race might even be conceived as synonymous with racism in defining individual resources, choices and opportunities, with extreme formulations suggesting that race *per se* precludes equality (11). Thus, all these factors should be considered in studies on racial inequalities in (oral) health if research and policy are to be effectively enhanced.

## Policy implications

- Due to their magnitude, persistence over time and unfair character, racial inequalities in oral health should be of primary concern for both policy makers and researchers in the field;
- Policy makers, researchers, dental professionals, and health care planners should be wary of the existing narrow conceptions of race, and their implications for initiatives at addressing racial inequalities in oral health;
- Although much of racial inequalities in oral health may be attributed to the over-representation of racial minorities in lower socio-economic strata, race also affects health via multiple interconnected non-economic pathways; and
- Viewing race from a broader multidimensional perspective has the potential to move the focus away from individual-level factors to the impact of wider social and historical processes, such as interpersonal and institutional discrimination, stress, and neighbourhood effects.

## References

1. Cabral ED, Caldas AF, Cabral HAM. Influence of the Patient's Race on the Dentist's Decision to Extract or Retain a Decayed Tooth. *Community Dent Oral Epidemiol* 2005;33(6):461-6.
2. Baker SR, Gibson BG. Social Oral Epidemiology Where Next: One Small Step or One Giant Leap? *Community Dent Oral Epidemiol*. 2014;42(6):481-94.
3. Gissis SB. When is 'race' a race? 1946-2003. *Studies in History and Philosophy of Science Part C: Stud Hist Philos Biol Biomed Sci*. 2008;39(4):437-50.
4. Whitehead M. The concepts and principles of equity and health. *Int J Health Serv*. 1992;22(3):429-45.
5. Garcia JA. The Race Project: Researching Race in the Social Sciences Researchers, Measures, and Scope of Studies. *JREP*. 2017:1-47.
6. Phelan JC, Link BG. Is Racism a Fundamental Cause of Inequalities in Health? *Annu Rev Sociol*. 2015;41(1):311-30.
7. Krieger N. *Discrimination and Health Inequities*. Social Epidemiology. New York: Oxford University Press; 2014. p. 63-125.
8. Williams DR. Miles to Go before We Sleep. *J Health Soc Behav*. 2012;53(3):279-95.
9. Kaufman JS, Cooper RS, McGee DL. Socioeconomic Status and Health in Blacks and Whites: the Problem of Residual Confounding and the Resiliency of Race. *Epidemiology (Cambridge, Mass)*. 1997;8(6):621-8.
10. Hone T, Rasella D, Barreto ML, Majeed A, Millett C. Association between expansion of primary healthcare and racial inequalities in mortality amenable to primary care in Brazil: A national longitudinal analysis. *PLoS Med*. 2017;14(5):e1002306.
11. Paradies Y. Whither anti-racism? *Ethn Racial Stud*. 2016;39(1):1-15.

## 4.2 Complex problems need complex solutions: Tackling inequality through integrated services

Tessa Boyd-Caine

### Introduction

‘Joint integrated action on the common risks for chronic diseases is therefore essential’ (1).

**A**S SIR MICHAEL MARMOT AND PROFESSOR KEVIN FENTON noted in the first monograph in this series, interconnectedness is central to understanding the social determinants of health (SDoH). The very notion of social determinants recognises that a person’s health is affected by structural, social and behavioural elements as well as medical. Conversely, the SDoH literature acknowledges that individual decisions and physiological attributes may outweigh wealth or education status as predictors of someone’s health and how they maintain it. Even when the conceptual frameworks shaping SDoH differ, interconnectedness has been a consistent theme across the literature for decades, as Figure 5 illustrates<sup>1</sup>.

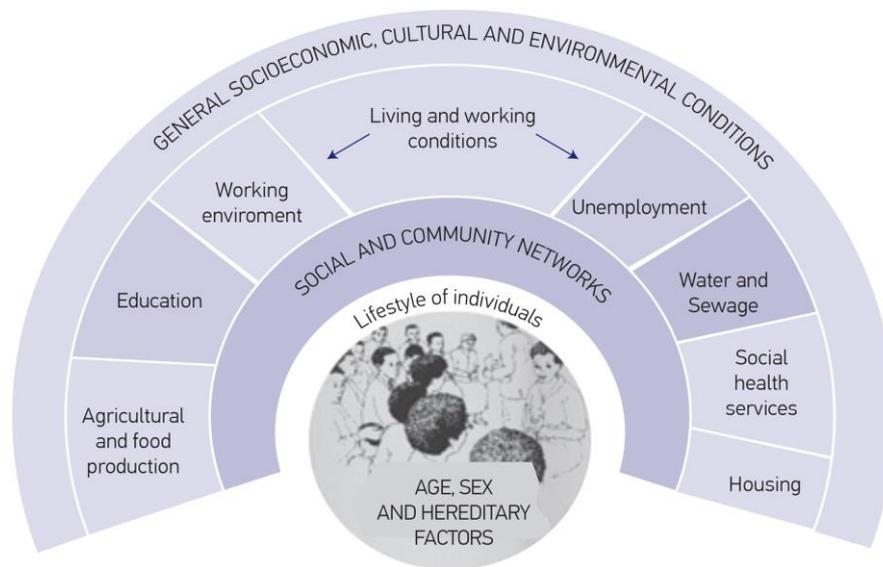


Figure 5: The determinants of health (2)

The Determinants of Health (1992) Dahlgren and Whitehead

### Interconnectedness in health policies and services

Why then do we continually fail to reflect this interconnectedness in health policies and services? For years following the World Health Organisation’s landmark study on the social determinants of health, it was difficult to engage Australian Government health officials in discussion about how their policies took account of the impact of housing, education or employment on people’s health. Only now are we seeing the concept of social determinants of health widely accepted within government. Even so, this broad acceptance translates to limited policy implementation. The Aboriginal Health Plan, a critical piece of Australian health policy, is an example where attention is currently being paid by government to the social and cultural determinants of health. A social determinants approach is being actively asserted in one of our greatest health priorities, the effort to improve the health and wellbeing of Australia’s First Peoples<sup>2</sup>. Yet this is one of the only policies within the Australian Government’s Health Department to engage closely with social determinants of health, despite a strong commitment to early intervention and prevention by the Federal Minister<sup>3</sup>.

<sup>1</sup> Notably, this illustration has gone on to inform visual representations of SDoH by many institutions, not least Australia’s own Institute of Health and Welfare.

<sup>2</sup> The review of the implementation plan for this policy notes, ‘the social and cultural determinants of Indigenous health are a key focus for this years’ online submission’. ‘My Life My Lead’ consultation process to shape the next Implementation Plan for the National Aboriginal and Torres Strait Islander Health Plan 2013-2023, <https://consultations.health.gov.au/indigenous-health/determinants/>.

<sup>3</sup> As identified by Bowles, M (2017) ‘A Vision for creating a healthy Australia’, The George Institute for Global Health, <http://www.georgeinstitute.org.au/news/a-vision-for-creating-a-healthy-australia-with-martin-bowles-psm-secretary-department-of-health>.

## Barriers to joint working

Policy siloes, where evidence is collected and policy decisions are taken in isolation, are one of the greatest barriers to fostering a policy environment conducive to the social determinants of health. The health system continues to focus primarily on services provided in hospitals and community health settings. It continues to assume its workforce comprises only health professionals and those who support them. While there has been a hard-fought effort to integrate services within health settings, this effort has focused on formalised health disciplines such as medicine, nursing and allied health. In the meantime, communities continue to struggle with poor health and wellbeing underpinned by factors that don't conform to neatly defined policy siloes.

But such siloing is not only a problem of policy-makers. It is reflected also in the way services are designed around professional expertise rather than community need. Routinely, our health and human services are structured around the professional expertise of their practitioners, not the needs of the communities accessing these services. Oral health is no different. The most hotly contested arguments in oral health are as often about which professionals are permitted to deliver which services, as they are about the best strategy to counter anti-flouridationists or to reduce the declining oral health of kids. While practitioners debate fee structures and who gets to regulate them, oral health inequalities grow; marked particularly by widening disparity in timely access to preventative services.

## Improving effectiveness

What is the lesson here for improving the effectiveness of oral health services? The first lesson is to recognise that oral health practitioners need to work together with other practitioners to address the individual circumstances that can impact upon – or undermine – a person's oral health. The following example from a health justice partnership I work with, demonstrates this.

Tanya is a 16 year old girl from a Cape York community. A dental health check through her school's Health and Wellbeing Program, identified significant infection in the gums above her front four teeth. Tanya required extensive dental care in order to avoid extraction of the four teeth. A home visit was arranged to discuss the situation with Tanya's mother. At the family home, staff met Tanya's father who was in a wheel chair having had both legs amputated due to diabetes. Tanya's mother was smoking out the front of the home and her 3 year old sister was drinking from a can of coke. While consent was provided for the dental treatment, it was evident that broader health education was required with the family across a range of areas<sup>4</sup>.

Oral health education alone is not going to improve the oral health of Tanya and her family. A nutritionist delivering education about the problems of sugar will have little impact if the alternatives are limited; if fresh, affordable food is not available. The intersection of Tanya's health, education and housing needs requires integrated responses from health and human service.

This should be no surprise to anyone informed by SDoH literature, which tells us that we often need to look over there for the solution to a health problem over here. But interconnectedness is not limited to people's individual behaviours. It extends to connections across the policy settings and program design that inform service delivery. This is particularly important where people experience a number of different problems that compound each other and drive particular vulnerabilities.

We know that changing community behaviour and attitudes is hard. We have much greater control over changing our own practices. If we can build integrated services that bring together the range of skillsets to meet people's varied and complex needs, we might have far greater success not just in responding when oral health problems present, but in preventing them in the first place.

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<sup>4</sup>This example was provided by a health justice partnership. Identifying details have been changed.

## Policy implications

- Researchers interested in understanding ongoing oral health inequalities should collaborate with researchers, policy-makers and practitioners in other fields to develop a truly comprehensive understanding of what's working; what's not; and how to improve it, to best address the health inequalities that are driving poor oral health.
- Professionals and practitioners who want to improve health and wellbeing, particularly in communities experiencing disadvantage, should reconfigure their services around the needs of the communities they are trying to serve. This may mean locating their services not in isolated shopfronts but within the settings that already have community trust. Examples of dental chairs in community health and school settings have already adopted this approach.

## References

1. Watt R, Listl S, Peres M, Heilmann A. Social inequalities in oral health: from evidence to action. London: International Centre for Oral Health Inequalities Research and Policy. 2015.
2. Dahlgren G, Whitehead M. Policies and strategies to promote social equity in health. Stockholm: Institute for future studies. 1991.

## 4.3 Geography matters to oral health and oral health inequalities

Mark Daniel

### Introduction

**G**EOGRAPHY MATTERS because the social health gradient and health status outcomes for a broad range of indicators exhibit geographic patterning (1). This reaches beyond widely known remote, rural and metropolitan variations in health and social status. Precisely stated, spatial variations in health and health inequalities exist between and within geographic areas, across a spectrum of scales from states to regions, communities, and local neighbourhoods (2, 3) (Figure 5).

Understanding spatial variations in health and social health gradients requires understanding how environments condition the expression of individual risk factors, namely, health-related behaviour, psychosocial and affective states, and allostatic load relevant to clinical outcomes(4). Environmental factors *indirectly* impact oral health outcomes through spatially-variable attributes that influence susceptibility to, and the impacts of, individual-level oral health risk factors. They *directly* impact oral health outcomes through policies on oral health services and broad-based supports, e.g. local fluoridation. The consequences of these effects are profound, especially where environmental factors shape health outcomes over time through cumulative responses to adverse spatially-specific exposures and related experiences at “critical periods” across developmental trajectories.

### Theory base

This framing is underpinned by Social Cognitive Theory, specifically, the concept of *reciprocal determinism* which posits that the constitution of any being is explained by a reciprocal interaction between cognitive, behavioural and environmental forces. People are thus neither powerless objects controlled by external environmental forces nor free agents who may achieve and be whatever they wish. People and environments being reciprocal, the limits of self-direction co-exist with opportunities for shaping destiny. This triad of cognitive, behavioural and environmental forces, and its ensuing outcomes, varies with place and time.

### Context and composition

Within and between geographic settings two forms of environments, context and composition are relevant to addressing spatial variations in health and social health gradients (4). *Context* pertains to (i) macro-level opportunities and resources including policies that affect the availability and affordability of health services and broad educational and economic conditions related to health, and (ii) meso-level conditions of living, including accessible *local* built and social environmental features that apply to a population in a given place. These features are ‘contextual’ as properties of places, rather than of individuals or aggregations of people. *Composition* in contrast is the collective features of a population in a given setting. Often expressed using aggregated socioeconomic or demographic data it also embodies lifestyle norms as defined by spatially aggregated collective behaviour which varies geographically (5). For example, positive local norms for daily oral hygiene (composition) might support lower oral health risk for individuals, yet oral health policy and accessible oral health services (context) will support both positive norms *and* directly reduce individual risk. Hence oral health and oral health inequalities can neither be understood nor systematically targeted using ecological strategies (co-ordinated multi-level and multi-sector actions) without knowledge of geographic variations in population context and composition.

### Risk conditions

Spatially-variable adverse population contexts and compositions are the ‘risk conditions’ that determine individual risk factors and disease outcomes for the people exposed to these places. Risk

factors in turn are the modifiable properties of individuals which exacerbate an essential biological vulnerability to disease. For oral health, spatially variable risk conditions *affect* the expression of individual risk factors. In so doing, they express through a greater prevalence of ill health the marginal position of exposed residents having sub-standard living conditions and poor quality environments and restricted health-related resources and life opportunities. In this sense 'the environment' reflects structural, social and economic policy decisions that manifest as regional and local variation in discrete, and measureable, contextual and compositional risk conditions (Figure 1). From the viewpoint of reciprocal determinism, this assessment situates oral health inequalities affecting disadvantaged people in terms of environmental forces which act upon them, not as arising only from the interplay of modifiable individual risk factors and non-modifiable markers (e.g. genes).

## Environments and oral health interventions

Heterogeneity in environmental factors has been shown to underpin population heterogeneity in relationships between behavioural risk factors, psychosocial status, allostatic loading and a breadth of health outcomes (6). Thus far, research on environments and oral health inequalities has shown only that geospatial variation exists in oral health (6) and that compositional risk conditions (socioeconomic differentials) are implicated in associations with oral health and oral health inequality within (7, 8) and between (9, 10) populations. Contextual risk conditions appear not to have been investigated. There is a need in oral health research to operationalise and analyse individual and *locally-specific* spatial environmental measures *including contextual factors* for evidence on how to support public health and optimal practices to reduce health inequalities. This requires employing in population oral health research the geospatial methodologies used in mainstream place and health research to better align with international recommendations (e.g. U.S. Centers for Disease Control & Prevention, Institute of Medicine) advising the collection of local-area data.

Optimal advances in population oral health will require recognising the masking of underlying heterogeneity that occurs when aggregating people into large geographic regions. Attenuating oral health inequalities requires elucidating the *locally-specific* environmental risk conditions shaping oral health. Describing pathways that connect these indicators to disease can provide knowledge relevant to planning, implementing and evaluating ecological interventions that go beyond risk factors in high-risk people to target factors that position, and shape, distributions of population risk. An understanding of environments and risk conditions can assist strategy for shifting entire distributions of antecedent factors that impact the clinical expression of oral health risk and disease. This is because, as for 'best practice' interventions for individuals, it is essential to tailor interventions to the characteristics of the target, in this case, for ecological phenomena, the built and social features of local areas where at-risk individuals reside, as well as broader macro-social aspects of policy and practice. Features of environments relevant to policy and ecological intervention must be explicated, weighed on importance, and assessed for changeability, as for individual risk factors. Attention must be directed to compositional and contextual risk conditions with interrelationships extending to behavioural, psychosocial, and pre-clinical antecedents of oral health risk and disease. Further research is also needed on the *joint influences* of these antecedents of poor oral health. This is vital to identify promising levers and strategies for geographically-tailored ecological and contextualised interventions.

## Policy implications

- Theory-driven conceptualisation of constructs, operationalisation and measurement development is needed to generate environmental indicators to capture variation in geographic features to better represent population context and composition.
- Use of geographic information systems, spatial statistics, and multi-level statistical methodologies is required to evaluate associations between environmental factors, individual-level antecedents, clinical risks and oral health and oral health inequalities.
- Integration into disease surveillance systems of compositional and contextual exposures as these vary over time with risk factors and oral health and oral health inequalities outcomes, referencing geographic locations.
- Ecological oral health intervention is warranted for different spatial settings within given populations, where meso-system changes can be effected against documented risk conditions to assess, over time, the joint impacts of environmental and behavioural interventions on oral health and oral health inequalities.
- International comparative research is needed to evaluate different policy environments that may underpin international differences and similarities in relationships between risk conditions, risk factors and oral health inequalities in different settings.

## References

1. Pickett KE. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *J Epidemiol Community Health*. 2001;55(2):111-22.
2. Galea S, Ahern J, Nandi A, Tracy M, Beard J, Vlahov D. Urban Neighborhood Poverty and the Incidence of Depression in a Population-Based Cohort Study. *Ann Epidemiol*. 2007;17(3):171-9.
3. Shouls S, Congdon P, Curtis S. Modelling inequality in reported long term illness in the UK: combining individual and area characteristics. *J Epidemiol Community Health*. 1996;50(3):366-76.
4. Daniel M, Moore S, Kestens Y. Framing the biosocial pathways underlying associations between place and cardiometabolic disease. *Health & Place*. 2008;14(2):117-32.
5. Carroll SJ, Paquet C, Howard NJ, Coffee NT, Taylor AW, Niyonsenga T, et al. Local descriptive norms for overweight/obesity and physical inactivity, features of the built environment, and 10-year change in glycosylated haemoglobin in an Australian population-based biomedical cohort. *Soc Sci Med*. 2016;166:233-43.
6. Eke PI, Zhang X, Lu H, Wei L, Thornton-Evans G, Greenlund KJ, et al. Predicting Periodontitis at State and Local Levels in the United States. *J Dent Res*. 2016;95(5):515-22.
7. Aida J, Ando Y, Oosaka M, Niimi K, Morita M. Contributions of social context to inequality in dental caries: a multilevel analysis of Japanese 3-year-old children. *Community Dent Oral Epidemiol*. 2008;36(2):149-56.
8. Ito K, Aida J, Yamamoto T, Ohtsuka R, Nakade M, Suzuki K, et al. Individual- and community-level social gradients of edentulousness. *BMC Oral Health*. 2015;15(1).
9. Guarnizo-Herreño CC, Tsakos G, Sheiham A, Marmot MG, Kawachi I, Watt RG. Austin Powers bites back: a cross sectional comparison of US and English national oral health surveys. *BMJ*. 2015:h6543.
10. Peres MA, Luzzi L, Peres KG, Sabbah W, Antunes JL, Do LG. Income-related inequalities in inadequate dentition over time in Australia, Brazil and USA adults. *Community Dent Oral Epidemiol*. 2015;43(3):217-25.

## Notes

## Notes



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