



Keeping up to date

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Addressing Oral Health Inequalities at the Population Level

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Nau mai, haere mai!

In this Keeping Up to Date paper Dr Kate Morgaine discusses how the fluoridation of community drinking water meets all the values and aims of health promotion.

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About the author

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Dr Morgaine was previously researcher and lecturer in public health and health promotion at the University of Otago. She has been a health educator and health promoter since 1985. She has worked in government and non-government organisations; primarily in sexual health and alcohol health promotion.

Introduction

Despite health being defined as a multi-dimensional construct by the World Health Organization¹ (WHO) and Te Whare Tapa Wha², oral health is often seen as uni-dimensional by many people; that is, only the health of the teeth and gums. However, oral health has been defined as that "...standard of the oral tissues which contributes to overall physical, psychological and social well-being by enabling individuals to eat, communicate and socialise without discomfort, embarrassment or distress and which enables them to fully participate in their chosen social roles."³ Oral health inequalities across the world are large and long standing, but not immutable.⁴ Within New Zealand, dental caries is a significant disease that impacts both physical health and quality of life. A clear social gradient is also evident, with the heaviest burden being borne by those who experience the most deprivation in our society.^{5,6,7} The Dunedin Multidisciplinary Health and Development Study (DMHDS) has followed a cohort of almost 1,000 New Zealanders from birth until their current age (38 years). Observations of their oral health status over this time has shown that those who were in the most deprived groups in both childhood and adulthood had three times the tooth loss at age 38 than those who were in the least deprived groups throughout their life. Similar

patterns of oral health quality of life were also found.⁸

Fundamental to health promotion theory and practice is the importance of reducing inequalities and disparities, and the right to health for all. While there is some debate about how to ensure these values are recognised in every action, they are cornerstone values of every health promotion programme. Influencing the determinants of health, such as poverty and income, employment, or education, is often beyond the everyday control of health promoters; however, a question remains: how can the underpinning principles be given effect in oral health?

Holes, cavities, tooth decay, caries: just some of the names for disease that affects the teeth. Caries occur when the teeth are exposed to bacteria in combination with food (especially various sugars) that creates acid. When we eat, the pH lowers in our mouths and our teeth demineralise; that is they lose some of the minerals from the enamel which protects them. In combination with the acid they become vulnerable to caries. Our saliva helps to remineralise the teeth over the next few hours restoring the pH balance, as long as there is no further consumption of food or drink for approximately two hours. This is a constant cycle.

There are few truly population level interventions available to reduce oral

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health inequalities and ensure the right to health. Universal access to care is an important aspect of reducing oral health inequalities and achieving health at a personal level, which requires population-level policy action. Current government policy and practice makes universal access to basic dental care available in New Zealand, if you are under 18 years of age. It is not available once you are an adult, and even for children and young people it is a downstream approach. An upstream action (literally) is fluoridation of community drinking water supplies. It is available to - and improves oral health for - all, it reduces decay for all, and is most beneficial for those who are most deprived.

Fluoride is a naturally occurring element in the environment, including surface water. This varies in concentration across the globe and within countries. In New Zealand it occurs at approximately 0.3ppm (parts per million); in some States in the USA it occurs at around 4ppm; and in other parts of the world, such as parts of India, it occurs at 15ppm. Fluoride is important in oral health and in the prevention of caries as it has three functions. It enhances remineralisation following consumption of food; once incorporated into the enamel it inhibits demineralisation; and it inhibits the ability of bacteria to adhere to, and thus attack, tooth enamel.⁹

Reducing oral health inequalities at a population level: Fluoridation of community drinking water supplies

Numerous studies have demonstrated the effectiveness of fluoridation in the community drinking water supply in preventing caries.¹⁰⁻¹³ A recent review of the scientific literature and government reports included 59 studies from 10 countries.¹⁰ In all studies the modal scores of percentage caries reduction able to be attributed to community water fluoridation (CWF) ranged from 30-60% in either primary or permanent teeth. The New Zealand Oral Health

Survey reported a 10% caries reduction in the overall population, attributable to CWF, with 40% less decay among children in fluoridated areas.⁷ In New Zealand a study comparing Wellington and Christchurch children, with and without CWF, showed that caries experience was lower for children in areas with CWF.¹⁴ Research has consistently shown that people who live in areas that have fluoridated community drinking water are less likely to experience caries.

The adjustment of fluoride levels to 0.7-1.0ppm in community drinking water has the additional benefit of providing dental protection to those who are least able to afford tooth-friendly food, toothbrushes, dental floss, and fluoride toothpaste, tablets, or dentist-based fluoride treatments. Several studies have reported on the impact of CWF on oral health inequalities as reflected in caries rates. A Southland study reported that the higher the socio-economic status of a child the lower the caries experience (measured by dmfs†) is. In addition, this study demonstrated that exposure to CWF reduced the effect of poor socio-economic status on oral health status.¹⁵ Studies from Great Britain have shown that the caries rate was higher for those children who live in deprived areas with no CWF.^{16,17} Analysis of the data from the British Dental Survey showed that the more deprived the area, the greater the effect of CWF in reducing dental decay.¹⁸ In almost all studies CWF has the effect of reducing the social gradient evident in caries rates.¹⁹⁻²²

Economic evaluations of CWF have been conducted in New Zealand, Australia, and South Africa, and demonstrate that it is cost-effective for populations greater than 1,000.²³⁻²⁶ The New Zealand study suggested that the 'break-even' point was a population of approximately 800-900.²⁷ Adjusting the community drinking water supply to contain the optimum level of fluoride is an important step in reducing oral health inequalities and achieving good oral health for all in the community.

There is no argument that, in excessive

doses, fluoride does cause harm. High doses over time do result in debilitating fluorosis of the bones, as seen in countries with high naturally occurring levels in community drinking water supplies (15ppm). Acute poisoning (resulting in digestive, cardiac, and respiratory abnormalities) is possible if an extremely high dose of fluoride is inhaled or ingested in one dose.²⁸ Communities with high levels of naturally occurring fluoride adjust it downwards in the community drinking water supplies rather than adjusting it upwards; as happens in New Zealand.²⁹ The issue of safety most often raised in New Zealand focuses on the regular everyday exposure to low doses of fluoride from community drinking water supplies.

One known effect of fluoride in low concentrations is fluorosis of the teeth, which can be mild, moderate, or severe. Teeth have a mottled appearance, ranging from white mottling in mild cases to dark brown mottling in severe cases. Not all mottled teeth are as a result of fluoride ingestion. There are several other explanations for it. The mottling can certainly affect appearance. In a number of studies of mild fluorosis participants were shown photos of people with and without white mottling of the teeth and asked to say which view of the teeth they preferred. For the most part either they considered the white mottled teeth (those with mild fluorosis) as more attractive as they were whiter or did not distinguish between unmottled teeth or those with mild fluorosis.³⁰⁻³³ While unsightly, fluorosis of the teeth is not harmful. Teeth are, in fact, more resistant to bacteria and subsequently caries. The WHO and the New Zealand Ministry of Health recommend that community drinking water be fluoridated at a concentration high enough to protect the teeth and low enough to minimise fluorosis of the teeth. In New Zealand, this amounts to ensuring the community drinking water has a fluoride concentration between 0.7 and 1.0ppm, or 0.7 – 1 milligram per litre of water. This recommended

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amount takes into account the amount of fluoride available from other sources in New Zealand such as toothpaste.

Statements by those who do not want to consume fluoride are frightening. They include such things as 1% of people are allergic to fluoride; fluoride lowers IQ and causes brain damage; it causes various kinds of cancers and especially bone cancer; and it is cumulative (personal communication: Bruce Spittle). The scientific evidence for those claims is very poor.^{34,35} If we look at communities in New Zealand whose drinking water has been fluoridated for decades (e.g. Hastings) there is no evidence that their population experiences any more allergies, cancer or, indeed, has a lower IQ than any other community in New Zealand which does not have fluoridated water.

A strong claim is made that fluoridating community drinking water supplies infringes the freedom of those who choose not to consume fluoride. It is true that there is an infringement of their freedom, just as the laws of the road infringe on our freedom to drive wherever and however we like. Health promotion has two important counter claims, based on core health promotion values, to the assertion of freedom by those who do not wish to consume fluoride.

First, fluoride in community drinking water supplies contributes to the protection of oral health for those in the consumption area, thus facilitating a right to health. Second, inequalities in oral health are addressed, as people who cannot afford access to tooth-friendly food, fluoride toothpaste, good dental care, or fluoride tablets, still receive an important preventive intervention. Removing fluoride from community drinking water supplies may address the issue of freedom for those who are opposed to fluoride, however, it infringes on the right to (or freedom to obtain) health of those who experience the most disadvantage in our society. Those who do not wish to have fluoride in their drinking water can exercise their right to do so by obtaining water without fluoride. While

some might say this comes at a cost, it is possible to collect rain water for free. For those who wish to exercise their right to have the protection fluoride use offers, the cost to do so when there is no CWF is far greater, is ongoing and susceptible to interruption.

Another claim is that it infringes their freedom to refuse medical treatment, that is, the mass medication argument. However, it can be argued that fluoridating the community drinking water supplies is not mass medication because it is not, actually, treating anything. Rather, it is preventing disease just as chlorine is preventing disease when it is added to the water.³⁶

Reducing oral health inequalities at a population level requires health promoters to join with, and support, their oral health colleagues in advocating for the fluoridation of community drinking water supplies throughout New Zealand, and supporting the retention of fluoride in those community drinking water supplies which already have it.

Reducing oral health inequalities at a personal level: Access-to-care

All children and young people in NZ have access to free, good basic oral health care and treatment until they are 18.³⁷ Children can be enrolled with the local Community Oral Health Service (COHS) or in some areas with iwi-based child oral health services, as soon as a parent or caregiver wishes, and certainly by the age of one. Once at school the COHS actively encourages enrolment and attendance. District Health Boards (DHB) estimate they see approximately 95% of eligible school children to Year 8. There have been changes in policy and provision of services in the last five years, which have consolidated dental services into larger hub clinics with mobile clinics servicing the wider district, rather than having clinics situated within school grounds. This may change the attendance rate as parents/caregivers are expected to bring the children to the clinics. The Ministry of Health is conducting a review of the change in service at

present, and results are not yet known.

At the end of Year 8 children are transferred to Government-funded services. All DHBs contract with local dentists, COHSs, or iwi providers to provide good, basic care for young people from Year 9 until they reach the age of 18. The current utilisation of this service nationally is 71%.³⁸ There is a wide variance in utilisation across the country, from 59% in Northland to 91% in South Canterbury.

Once people reach 18 years old they are expected to pay for their own dental care with no subsidy from the Government. If a person is on a Government benefit or has a Community Services Card, it is possible to apply for a small amount of money for 'relief of pain' dental care. The cheapest relief of pain is an extraction, whereas a full restoration, perhaps including a crown is at least four times that amount. Dental care is expensive, not least because there are no Government subsidies for the majority of adult care. This means that dentists must fully cost-recover for materials, rent, salaries, utilities, and safely disposing of medical waste. Primary health care from doctors has been subsidised for many years with Primary Health Organisations being the most recent and adequately funded of these. Unfortunately this support has not been extended to include dental primary health care for adults.

Reducing oral health access-to-care inequalities requires several steps:

- Health promoters recognise that oral health is an important aspect of general health and include oral health in all their health promotion programmes, especially where synergies are identified. For example: nutrition/tooth-friendly food, sports injury prevention/mouthguards, or smoking/oral cancer prevention;
- Health professionals (including health promoters) encourage their clients to access all the free care they are entitled to;

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- Health promoters advocate for provision of subsidised oral health care for adults; in line with other primary and secondary health care services.

Conclusion

Fluoridation of community drinking water meets all the values and aims of health promotion, in that it reduces inequalities and upholds the right to health, regardless of ability to pay.

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† Experience of caries is measured by the number of decayed, missing, or filled teeth or surfaces. It is referred to as DMFT (teeth) or DMFS (surfaces). If it is in upper case it refers to permanent or adult teeth. If it is in lower case (dmft, dmfs) it refers to primary or baby teeth.