

**Editorial****Celebrating 50 years of water fluoridation in Birmingham – a time for decision-makers to tackle high tooth decay rates elsewhere**Councillor J. Cotton<sup>1</sup>, Alderman J.Charlton<sup>2</sup> and Councillor G. Harkin<sup>3</sup>

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Fifty years ago Birmingham became the first major city in England to fluoridate its water. Tooth decay among the city's children was rampant. Multiple extractions under a general anaesthetic were common.

Fortunately, a far-sighted public health doctor, Dr Leslie Millar, knew about the success of water fluoridation in the United States and Canada and advised councillors to introduce a scheme in Birmingham. Fortunately, the councillors listened and voted in favour of the proposal, despite the efforts of fluoridation's opponents to frighten the local population with horror stories about the nasty things that would supposedly happen to them.

**Significant dental health benefits**

In 1964, residents of Birmingham began consuming water whose natural fluoride content had been artificially adjusted to the optimum of one part of fluoride per million parts of water. Within six years, a study (Beal *et al.*, 1971) comparing the Northfield suburb of Birmingham with socially equivalent but (then) non-fluoridated Dudley showed that the council's bold decision was paying off. The average score for decayed, missing and filled teeth among 5-year old children had dropped by 46% in Northfield but had scarcely changed in Dudley. Science and reason had triumphed over scare-mongering.

In 1981, Birmingham's community dental service released figures confirming the benefits. Since fluoridation began, extractions of deciduous teeth in children aged under 15 had fallen from 35,000 per year to just over 9,000, and extractions of permanent teeth from around 11,000 to 3,500. General anaesthetics for tooth extractions in under-15s were down from 18,000 per year to 2,000, whilst emergency dental visits because of toothache had dropped from around 10,250 to 1,500. Within just 16 years of the start of water fluoridation, children's dental health in Birmingham had been transformed.

A later study (Riley *et al.*, 1991) found that decay levels were generally lower among children in fluoridated communities than among those from socially equivalent, but non-fluoridated, communities elsewhere. It also found that differences in decay levels between children from

the most and least affluent backgrounds were narrower in areas with fluoridated water.

**Extending the benefits to other communities**

Birmingham's pioneering move inspired many other places to follow suit. Between the late 1960s and mid-1970s new schemes were introduced in Warwickshire, Worcestershire, Tyneside, Cumbria, Cheshire and elsewhere. Then, between the early 1980s and mid-1990s, a further wave of schemes was introduced in Coventry, Dudley, Walsall, Wolverhampton and large areas of South Staffordshire.

Today, around 6 million people in England are supplied with fluoridated water. As a report by Public Health England (2014) has shown, children in fluoridated areas generally have fewer teeth affected by decay than those in non-fluoridated areas, and at the age of five and twelve years children in fluoridated areas are less likely to have had any decay than those in non-fluoridated areas. Significantly, the PHE analysis also found that 45% fewer children aged 1 to 4 years in fluoridated areas were admitted to hospital for dental decay – primarily to have decayed teeth extracted under a general anaesthetic – than in non-fluoridated areas.

**No evidence of harm to health**

What about the predictions of those who fought so hard to stop Birmingham from introducing fluoridation in the first place? Nothing has emerged, whether from routine public health monitoring or from specially commissioned studies, to suggest that fluoridation has caused harm to health in Birmingham or other parts of the West Midlands.

After reviewing a range of health indicators in all the fluoridated and non-fluoridated areas of the country, Public Health England (2014) found no differences in rates for hip fractures, Down's syndrome, osteosarcoma and all types of cancer. It did find lower rates of kidney stones, bladder cancer and all-cause mortality in fluoridated areas. However, unlike those opponents of fluoridation who tend to jump on the slightest of differences in health indicators

to ascribe cause and effect, PHE rightly points out that no presumptions can be made about the ability of water fluoridation to prevent these conditions.

### **Looking back with a sense of pride**

When Birmingham councillors and decision-makers of today look back at the decisions of their predecessors half a century ago, it must be with a sense of pride at the leadership displayed and the commitment to improving public health. When Birmingham compares itself with its North Western counterpart, Manchester, the dividends of that bold decision-making are clear to see. Surveys in recent years show that Birmingham 5-year olds experience, on average, 34% less tooth decay than their counterparts in Manchester (PHE NDEP, 2013). For 12-year olds, the difference is 42% (NHS DEP, 2010).

Hospital admissions of 0 to 19 year olds for tooth extractions under a general anaesthetic are several times higher in the mainly non-fluoridated North West than in the largely fluoridated West Midlands (Elmer *et al.*, 2014). At a cost of around £600 per general anaesthetic case, it is estimated that the NHS spends around £4 million a year more in the North West on extracting teeth from children and young people than it does in the West Midlands. As one of the authors of the York report has argued: “General anaesthesia for the extraction of teeth in children must surely represent the ultimate failure in dentistry” (Chestnutt, 2014).

### **The most cost-effective tool**

Fluoridation is not a total solution for reducing tooth decay. Rather, it should be seen as the most cost-effective tool in a range of solutions which also comprise brushing at least twice daily with a fluoride toothpaste, limiting consumption of sugary foods and drinks and, in some instances, applying fluoride varnish to teeth. These are complementary, not mutually exclusive, strategies.

Sadly, children in many communities still have unacceptably high levels of tooth decay – not only in Greater Manchester and other places in the North West but in parts of Yorkshire and cities in other regions of the country. Major dental health inequalities persist. Concerted action is needed to tackle them. Fluoridation is rightly at the top of the list of options for that.

### **Public health in action – a time for councillors to make the bold decisions**

Responsibilities for public health – including children’s oral health and water fluoridation – are once again vested in local government after a 40-year period in the NHS. That puts the spotlight very much on elected councillors and local health and wellbeing boards.

Will they act with the same fortitude and leadership as Birmingham councillors did in the early 1960s? Right now, there is a golden opportunity for local government to make a real difference for children in many of our most under-privileged communities.

Indeed, if we ask ourselves what single initiative would make the biggest impact on dental health inequalities in England over the next ten years, the answer has to be extending water fluoridation – where technically feasible – to those places with the highest rates of tooth decay.

So councillors are in the driving seat. They can and should demand reports from their professional advisers on the scale of the problem locally and the potential benefits of water fluoridation.

Of course there will be stamping of feet from small but highly vociferous opposition groups. But what matters most – placating individuals who have convinced themselves that adjusting the fluoride in water to a concentration of one part per million is an infringement of their human rights, or protecting hundreds of thousands of teeth from the ravages of decay?

When a councillor looks back in years to come on what he or she has achieved through public office, what greater satisfaction could there be than knowing that far fewer children in their early years have had to be put to sleep in a hospital operating theatre so that badly decayed teeth – often several at a time – can be removed? That is public health in action.

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