Pre- & Post-Water Fluoridation
Oral Health Survey
in
Northland/Te Tai Tokerau

Considering fluoridation

- Effectiveness  Does fluoridation work? ✓
- Efficiency   Is fluoridation worth doing? ✓
- Equity      Is fluoridation fair? ✓
- Appropriateness  Is it suitable? ✓
- Acceptability  Does it upset anyone? ✓
- Safety      Is fluoridation safe? ✓
Acceptability

• Fluoridation can be controversial!
• Māori values with respect to water
  – Wai ora, wai kino, wai mate
• “Compulsory medication”
• Impurities
• Recent referenda
  – “No” in Westport, “Yes” in Hamilton
• Recent decisions
  – “Yes” in Dunedin and in Central Hawkes Bay

Background

• Tooth decay (dental caries) in Northland is very, very high
  – 88% of 5-6-year-olds
    • 6 affected teeth
  – 85% of 12-13-year-olds
    • 4 affected teeth

Gowda et al, New Zealand Dental Journal 105: 116-120, 2009
Background

• On 20 July 2006, the Far North District Council resolved to fluoridate Kaitaia and Kaikohe
  – The first such initiative by a TLA for 23 years

• Fluoridation was to begin in April 2007
  – Two-year trial
  – Effectiveness to be monitored by health authorities (NDHB and MoH)
The Northland surveys

Fluoridation undertaken

Baseline survey (pre-fluoridation)

Follow-up survey (post-fluoridation)

2007

2009

Fluoridation not undertaken

Kaikohe
Kaitaia

Dargaville
Kawakawa/Moerewa

5-6-year-olds – deciduous dentition
12-13-year-olds – permanent dentition

NB: the same children were not examined in 2007 and 2009

Caries at baseline: 5-6-yr-olds

• 88% had caries experience
  – 91% in Kaitaia, 96% in Kaikohe, 97% in Kawakawa/Moerewa, 74% in Dargaville

• An average 6 teeth affected per child
  – 23% had had teeth out
Caries at baseline: 12-13-yr-olds

- 85% had caries experience
  - 88% in Kaitaia, 85% in Kaikohe, 90% in Kawakawa/Moerewa, 78% in Dargaville

- An average 4 teeth affected per child

![Graph showing actual water fluoride levels](image)

Actual water fluoride levels

- Target concentration: 0.7 - 0.8 ppm F
- Graph showing fluoride levels from January to March 2007, 2008, and 2009?
Changes in average number of decayed surfaces – 12-13-year-olds

Changes in carious lesions on x-rays

The most obvious signs that the water F was having some effect on the smooth-surface caries

No change in these communities

Mean DS

Kaitaia Kaikohe Kawakawa Dargaville

2007 2009

Mean % R1 to R4

Kaitaia Kaikohe Kawakawa Dargaville

2007 2009

Effect sizes: 0.23 0.37 -0.08 0.01
Things to take into account

• Study design
  – Randomised control trial not ethically possible
  – Longitudinal study before and after would be better than 2 cross-sectional surveys, but time and funding constraints precluded that

• Fluoridation levels
  – Of the 2 Kaikohe plants, 1 managed to reach the target on only 4 occasions, the other not at all

• Sample representativeness

• Statistical power

• Length of the assessment period

Strengths of the study

• Surface-level caries information
  – Subtle differences able to be detected earlier than otherwise

• Use of radiography

• Robust survey methods used
  – Highly calibrated and reliable examiners
Concluding remarks

• FNDC to be commended for fluoridating the 2 communities
  – Some beneficial oral health effects were seen
    • 12-13-year-olds had less caries, as well as fewer lesions visible on x-rays

• However:
  – 2 years not long enough
  – The fluoridation needs to be consistent

• FNDC may wish to consider:
  – Continuation of fluoridation in Kaitaia and Kaikohe
  – Extension of it to other Northland communities