



Mercury in Primary Teeth from Contemporary Norwegian Children

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1) INTRODUCTION

Primary teeth have been shown to act as indicators of mercury exposure. A pilot study of Norwegian primary teeth collected 25 years ago indicated a significant increase in mercury body burden compared with a material of preindustrial primary teeth analysed at the same time. Since then Norway has been deescalating the use of mercury. A new collection of teeth from 17 Norwegian counties has recently been performed and results from analyses of lead and cadmium have been presented.

2. OBJECTIVES

The objectives of our investigation were to measure mercury concentrations in the contemporary Norwegian primary teeth, study the geographical distribution of the metal in Norway on this basis and correlate the results with the concentrations of other metals from the same material.

3. METHODS

Eight hundred and twenty seven primary teeth, collected from seventeen Norwegian counties during 1990-94, were used (Fig 1). The teeth were ground to a tooth-powder and analysed for mercury in duplicate using cold vapor atomic absorption spectrophotometry. As the mercury values were not normally distributed, they were all logarithmically transformed before statistical treatment. The statistical analysis was done using SPSS for Windows version 6.01.

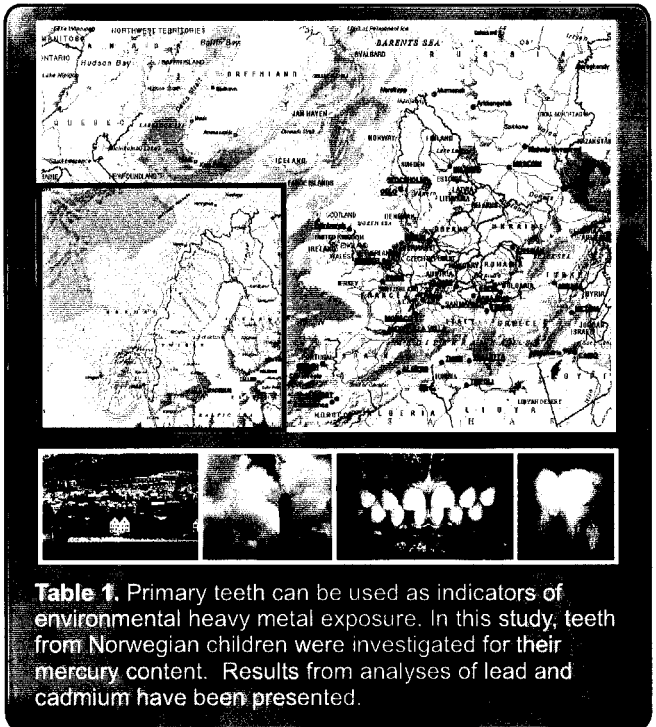


Table 1. Primary teeth can be used as indicators of environmental heavy metal exposure. In this study, teeth from Norwegian children were investigated for their mercury content. Results from analyses of lead and cadmium have been presented.

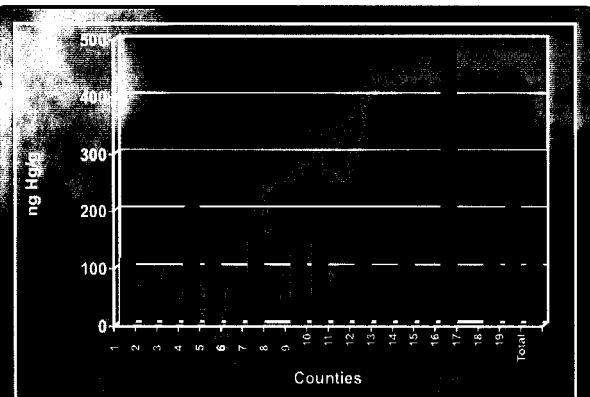


Fig. 2 Geometric mean concentrations in contemporary Norwegian primary teeth according to county of origin. All measured values are in ng Hg/g tooth-substance.

Table 1

No.	G.Mean	G.SD	Median	Min.	Max.
827	116.7	3.97	93.6	4.8	16880.4

Geometric mean (G.mean), geometric standard deviation (G.SD), median, minimum (Min.) and maximum (Max.) mercury concentrations in contemporary Norwegian primary teeth. All measured values are in ng Hg/g tooth-substance.

4. RESULTS AND DISCUSSION

The geometric mean (G.mean) for the whole material was 116.7 ng Hg/g tooth substance (Table 1). We found significant differences in mercury levels between the 17 counties investigated with the highest levels in Nord-Trøndelag ($p < 0.001$ by One-way ANOVA - Fig. 2). The communities with the highest mean mercury levels were Revetal and Stjørdal (G.mean=816.6 and 481.9 ng Hg/g tooth substance respectively). There were significant, positive correlations between mercury and lead ($r=0.21$, $p < 0.001$) and between mercury and cadmium ($r=0.17$, $p < 0.001$) by Pearson's correlation procedure. The levels found were considerably lower than in the 25 years old Norwegian material (3230.0 ng Hg/g tooth substance). However, they were comparable to values found in the material from preindustrial Norway and materials from Hungary and Chile. The Norwegian authorities have during the last decades conducted a deliberate campaign against the use and discharge of mercury. The results of the present study indicates that the efforts have led to a reduction in the human exposure to mercury.

5. CONCLUSIONS

- * Mercury levels in Norwegian primary teeth have been greatly reduced during the last twenty years.
- * The reduction may reflect a decrease in the environmental mercury burden in Norway.