Re: Altitude as a Risk Indicator of Dental Fluorosis in Children Residing in Areas with 0.5 and 2.5 mg Fluoride per Litre in Drinking Water (Caries Res 1999;33:267–274)

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This paper states correctly in the Introduction, 'the role of altitude as a risk indicator of dental fluorosis seems to be undecided' [Manji et al., 1986; Mabelya et al., 1992, 1997]. The purpose of this study was to assess the association between altitude and dental fluorosis among Ugandan children in two fluoride districts while controlling for other factors related to fluorosis. The final conclusion in the paper is 'altitude was a significant risk indicator after controlling for possible confounders'.

We would like to comment since we have concern about the straightforward conclusion of this paper. Regression analyses were used to identify explaining variation in the percentage of teeth affected by fluorosis. Independent variables were fluoride intake, altitude, etc. However, the regression model is only valid if the independent variables are precise [Kleinbaum et al., 1998]. This is not the case with the fluoride intake, since the collected data from 10 to 14-year-old children and their mothers were extrapolated to 3-year-old children. Thus, controlling for confounders was not achieved and hence the correction was not complete, leaving 4–5% unexplained variance to the altitude, which is meaningless (biased). As it turns out from the only 28–51% explained variance to the fluoride intake, these data were really inaccurate. A valid estimate of the altitude inference may only be obtained after attenuation correction [Jöreskog, 1978] of the fluoride data, which cannot be applied in this case, because the method error is unknown.

Summarizing, it may be stated that the data of this paper do neither reject nor support the hypothesis of altitude as a risk indicator of dental fluorosis. A more careful conclusion would have been appropriate. Therefore, we raise objections to the formulation 'Altitude as a risk indicator of dental fluorosis...' in the title of the paper.

Reply

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We would like to thank Drs van Palenstein Helderman and van't Hof for their comment concerning our paper exploring the relationship between altitude and dental fluorosis. Needless to say, this was a cross-sectional study. Data were collected retrospectively and in no way could the method error pertaining to independent variables be known. To achieve attenuation correction of the data in identifying risk factors, prospective longitudinal studies need to be conducted. However, prevalence data can justifiably be used to detect *risk indicators* which may be disputed or confirmed by longitudinal studies [Beck, 1998]. Thus, formulation of the title 'Altitude as risk indicator of dental fluorosis...' was carefully chosen based on the prevalence data.

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