Reviewer's report

Title: Prevalence of anemia and deficiency of iron, folic acid, and zinc in children under 2 years of age and beneficiaries of the Mexican Social Security Institute.

Version: 1 Date: 12 July 2007

Reviewer: ann hill

Reviewer's report:

General
A nationwide health and nutrition survey of children under two years of age (n=35997) was conducted in Mexico between 1999 and 2001 and this article reports the iron, folate and zinc status of a sub-sample of children (n=4955) studied in 2000-01 who were beneficiaries of the Mexican Institute for Social Security. Benefits to families were delivered either through the ‘regular regimen’ (RR) for salaried non-government employees or though the ‘IMSS-Oportunidades’ (IO) for poor rural populations. The objective of the survey of the sub-sample was to determine the prevalences of anaemia and iron, folate and zinc deficiencies at national and regional levels. Although socioeconomic, dietary, anthropometric, and health status data were collected, no attempt is made to relate these factors to regional differences in prevalence. This article is thus essentially a database with descriptive statistics.

Sampling method: The aim was to study a sample that was representative of the national population of beneficiaries. The primary sampling appears to be sound, but the secondary sampling is beset with problems, only some of which the authors discuss. Of particular concern are the following:

a) the sub-sample was recruited from children attending clinic, rather than from the community
b) children with a history of illness in the previous two weeks were not included
c) the calculated sample size was not achieved, particularly in the South region (~50% achieved)
d) there was major under-representation of children aged 1-5 months and over-representation of children aged 6-11 months (e.g. 13% and 39% of the sub-sample were aged 1-5 and 6-11 months respectively compared with an expectation of ~21 and 25%)
e) in the IO sample, there were many missing data for ferritin and zinc (~50% missing).

These limitations cast doubt as to the representativeness of the sub-sample and prevalences.

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Major Compulsory Revisions (that the author must respond to before a decision
on publication can be reached)

In the Discussion, the authors should add a), b) and e) above to their list of limitations and discuss the implications.

Details of the methods: These are mostly clear, apart from the following, which should be clarified:

a) prevalences calculated for the sub-sample were expanded to regional and national levels but it is not clear how this was done and no reference is given. In the Tables it is not stated what ‘N’ represents and the regional and age group N vary in each of the Tables, both in absolute terms and as proportions. Presumably N is linked with the expansion factor and perhaps with a weighting factor but until this is clarified the variability of N will remain puzzling.

b) recruitment needs to be clarified as in the Methods it is said to be from outpatient, vaccination and well-baby clinics but in the Discussion it is said to be from well-baby clinics

c) the formula for adjusting Hb for altitude is unclear/incomplete

d) actions taken to ensure data quality should be added, particularly regarding blood sampling and blood analysis.

Results: The following should also be reported:

a) number (%) of children excluded because of illness in the previous 2 weeks

b) number (%) of refusals, and whether they differed in their social background etc from those who participated

c) the % of blood samples with missing data, and main reasons for loss

d) number (%) who had all four measurements (Hb, ferritin, folate and Zn).

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

The following should be inserted/corrected:

• in the Abstract: ‘Methods’ should be positioned before ‘Results’

• throughout the manuscript, the comparison group should always be specified when making comparative statements (e.g. the sentence ‘Children with anaemia have higher percentages of folic acid deficiency.’ is incomplete as it does not indicate the comparative group

• throughout the manuscript, the term ‘fewer than’ should be used instead of ‘less than’ when referring to children or cases

• Background p2: ‘erythropoesis’ (not erithropoyesis)

• Background p2: ‘preterm’ (not premature)

• Methods p1: the sub-sample was taken from a larger sample of children aged 1-23 months, yet Hb cut-offs include children <2 weeks and children aged 2-3 weeks. If the sample starts at age 1 month, then these cut-offs should be
removed from the text and Tables to avoid confusion.

- **Methods p2**: ‘immunoradiometric assay’ (not essay)
- **Results p2**: ‘overall prevalence of iron deficiency’ (not global prevalence...)
- **Results p4**: the relevant region needs to be inserted in the sentence ‘prevalence of iron deficiency in was 23.4%’
- **Results p5 and p6**: ‘significantly different when comparing RR with IO’ (not significant different..)
- **Discussion p1**: it is the age group 6-11 months that is notably over-represented (not those aged 12-23 months)
- **Discussion p2**: it is not possible to be confident that the sub-sample reflects the population that uses the IMSS health facilities, as children with recent illness were excluded and there is considerable under and over representation of certain age groups
- **Discussion p2**: ‘sensitivity’ (not sensibility)
- **Discussion p4**: ‘children 6-11 months old..had a prevalence.. of 20.9%’ (not ‘children 2 years old..’)
- **Discussion p4**: it is not possible to claim that anaemia at 1-5 months reflects poor iron stores as well as poor complementary foods, as no data are presented to support this.
- **References**: some errors exist e.g. spelling of names, and the references need careful checking.

When revising the manuscript, it would be helpful to insert page numbers.

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**Discretionary Revisions (which the author can choose to ignore)**

Although identification of explanatory factors is not an aim of this article, it would be helpful to readers unfamiliar with Mexico to include a brief description of i) key contextual differences that exist among the North, Central and South regions, and ii) any differences in the service packages provided by RR and IO, including provision of haematinics.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**
I declare that I have no competing interests.