Reviewer's report

Title: Measles Vaccine Coverage and Factors Related to Delayed Immunization among 18-month-old and 36-month-old Children in Kyoto, Japan.

Version: 1 Date: 30 November 2004

Reviewer: Glenda Lawrence

Reviewer's report:

All of my comments in the report below that relate to data analysis and presentation, including issues around the validation of parent report of vaccination status are 'major compulsory revisions'. The others are at the authors' discretion.

Measles vaccine coverage and factors related to delayed immunization among 18-month-old and 36-month-old children in Kyoto, Japan
This paper describes a cross-sectional survey to assess measles vaccine coverage and related factors among a large sample of children presenting to health clinics in Kyoto for routine health checks at 18 and 36 months of age. Parents provided information, in a self-completed questionnaire, about their child's immunisation status, their knowledge and beliefs about immunisation and socio-demographic factors.
The study parallels similar studies in other affluent developed countries to identify factors related to the non-uptake of measles vaccine by parents. This has relevance both nationally and internationally because, since 1996, there has been a global initiative to eliminate measles. In this era of measles elimination, the paper provides some interesting and relevant information from a developed country that appears to have some way to go before they achieve measles elimination, which as many comparable countries have achieved.
The methods are generally well described and appropriate to answer the research question. The results section, and particularly the tables presenting the logistic regression results, requires some editing to assist the reader. The discussion is generally well balanced and is relevant. It would be improved if the results of this study were discussed more broadly in the international context (in addition to the USA).

Abstract
The authors conclude that a system to enhance access to vaccination is required. It seems to me from the paper, that other factors are also important, including communication with parents about the changing vaccination schedule.

Introduction
The authors imply that the global strategy for the elimination of measles commenced in 2001. This is not so – it commenced in the 1990s and many countries implemented immunisation and enhanced measles surveillance policies related to this during the late 1990’s. Some (e.g. the Americas) achieved measles elimination quite early. The two dose strategy came later, in 2000 when it was realized this would be necessary for elimination in many countries due to insufficient coverage with the first dose, plus failure by some vaccinees to seroconvert. Two doses prevents the build-up of number of people in the population who are susceptible to measles infection to a level that is able to sustain outbreaks of disease.
The phrase that 2 doses maximises “both individual and population immunity” could be misunderstood by readers not familiar with this subject. The purpose of the 2nd dose of measles-containing vaccine is not to increase the level of immunity, but to increase the total number
of people who are immune. A two dose policy provides an opportunity for vaccination of those who missed the first dose and to re-immunise those who failed to sero-convert with the first dose, usually because circulating maternal antibody levels inhibited sero-conversion.

It would also help readers if more information was included in the introduction about recent changes in measles immunisation policy in Japan as they affect the birth cohorts were selected for this study. It was only when I read the discussion section that I realised that at the time the study was conducted in late 2002, the children in the 18 month age-group may not have considered overdue for measles vaccine until they reached the age of 24 months.

The 2000 national survey – reference [9] is unlikely to be accessed by international readers. Could the authors please indicate how coverage was estimated in the national survey (parent-report, validation, reliability etc).

Methods
Parent questionnaires: what were the response options? Did they include ‘unsure’ and ‘refusal’?
Logistic regression analysis: there is no mention of the multivariate analysis or the methods used to construct the dummy of variables to combine knowledge and concern about adverse events (as reported in Table 4).
Validation study: how many records were assessed and on what basis were they selected (random sample, convenience sample etc)?

Results
Paragraph 1, lines 5,6: it would be clearer for readers if the authors specified that the response rates of 88% and 82.5% were for the immunisation survey (i.e. denominator is the number who attended for the health check).
Page 6: Quite a lot of the text describing measles coverage and incidence could be put into a table if the authors wished to reduce the amount of text. It may be easier to follow in a table..
Validation of vaccination status: did those who were included in the ‘validation’ group differ in characteristics compared to parents who were not included in the ‘validation’ group?
Page 6, paragraph 1, line 12: the authors indicate that measles incidence was ‘significantly’ higher among children who interacted with other children but no p value is provided to indicate whether the difference was statistically significant.
Reasons for not receiving measles vaccine: was the difference in the percentage reporting concern about adverse events in the unimmunised children statistically significantly different for the 18 month group (2.9%) versus the 36 month group (9.5%).
There is no reference to table 2 in the text (page 7)
Predictors of low coverage: This section is not written very clearly; there is no indication of the direction of association and the titles of paragraph and table appear to be contradictory i.e. are you focusing on factors associated with children being immunised or factors associated with incomplete immunisation? Was age mother’s age of <30 years associated with the child being immunised or not immunised? This is not clear from the table or the text.
Tables 3 and 4 would be clearer for readers if the direction of association was shown (see suggestion below)
Factors related to completed measles vaccination (18 month group)
Variable Prevalence Odds Ratio (95%CI) P value
(n=1836)
Mother’s age (>30 years) 63.3% 1.11 (0.93, 1.32) 0.26
Mother working 25.1 0.60 (0.50, 0.73) <0.0001
First born child 54.5 1.93 (1.62, 2.30) <0.001
Interact with other children 21.3 0.57 (0.46, 0.69) <0.001
Presence of allergy 17.8 1.11 (0.89, 1.40) 0.37
Concerned about adverse events 30.0 0.77 (0.64, 0.93) 0.007
Knowledge score: 7-12 points 39.3 2.09 (1.73, 2.53) <0.001

(Also, it is easier for the reader if all variables are in the same direction – i.e. No concern about
adverse events OR = 1.30; Mother not working OR= 1.67)
Table 4: It would be clearer to give the adjusted OR of G1 as 1.0 (referent) and to indicate what G1 is (i.e. low knowledge, high concern), then state the OR values for each of the other groups e.g.
Low knowledge, high concern (G1) 1.00 (referent)
High knowledge, high concern (G2) 2.70
Low knowledge, low concern (G3) 1.71
High knowledge, low concern (G4) 3.65

• How many respondents were in each of the 4 groups?
• These results suggest that the level of knowledge is more highly correlated with immunisation status than the level of concern about adverse events. Would the authors care to comment on this in the discussion?
• What happened to the adjusted OR values when the ‘child allergy’ variable was removed from the final model? It isn’t statistically significantly associated with measles immunisation status in the univariate or multivariate analyses.
• Did the authors check for colinearity in the multivariate regression model—eg mother’s age and first born child?

Discussion
The explanation of the coverage calculation used for the national survey (reference 9) is not clear. The denominator does not seem to be appropriate.

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

Level of interest: An article whose findings are important to those with closely related research interests

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

Statistical review: No

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