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## Effectiveness of measles vaccination and vitamin A treatment

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### CRD summary

The review concluded that measles vaccine and vitamin A treatment were effective interventions to prevent measles mortality in children. The review had some methodological problems and some of the studies were conducted over 50 years ago, thus a degree of caution is required when interpreting the authors' conclusions.

### Authors' objectives

To determine effect estimates of measles vaccine and vitamin A treatment for the Lives Saved Tool (LiST).

### Searching

PubMed, the Cochrane Library and all WHO regional databases were searched from 1960 to 2008 for articles in any language. Search terms were reported.

### Study selection

Randomised controlled trials (RCTs) or quasi-RCTs of measles vaccination and vitamin A treatment for measles were eligible for inclusion. Observational studies of all-cause mortality were also eligible for inclusion. Trials using high titre measles vaccination were excluded.

The included studies were published between 1932 and 1999 and included children aged between 6 months and 13 years (where stated). The vaccination trials provided outcome data on measles mortality and disease. The included vitamin A treatment trials provided outcome data on measles mortality following one dose, or two or more doses of vitamin A in predominantly African countries. Studies of measles vaccine were also conducted mainly in Africa.

The authors did not state how many reviewers performed study selection.

### Assessment of study quality

Quality assessment was undertaken using the CHERG (Child Health Epidemiology Research Group) adaptation of the GRADE (Grades of Recommendation Assessment, Development and Evaluation) checklist. Studies classified as low quality were excluded.

The authors did not state how many reviewers undertook the quality assessment.

### Data extraction

The data on measles disease and mortality were double extracted and used to calculate relative risks (RRs) and 95% confidence intervals (CIs).

### Methods of synthesis

The pooled relative risks, together with 95% confidence intervals, were calculated using the Mantel-Haenszel fixed-effect meta-analysis. If statistical heterogeneity was present, the DerSimonian-Laird meta-analysis was utilised. Statistical heterogeneity was assessed using the  $X^2$  and  $I^2$  statistic. Results were expressed as relative benefit (1-RR).

### Results of the review

Three high quality trials of measles-specific mortality following measles vaccine, five high quality trials of measles disease following measles vaccine, and 14 low quality studies of all-cause mortality were included in the measles vaccination review. Five moderate quality trials of measles mortality following one dose of vitamin A treatment and three moderate quality trials of at least two doses of vitamin A treatment were included in the vitamin A treatment review.

**Measles vaccine:** A single dose of vaccine reduced measles disease by 85% (95% CI 83 to 87; five studies; n appeared

to be 26,679 children).

Vitamins A treatment: One dose of vitamin A was not associated with a statistical benefit in terms of measles mortality (five trials). At least two doses of vitamin A (200,000 IU for children over one year and 100,000 for infants) were associated with a statistical benefit in terms of a 38% reduction in measles mortality (95% CI 18 to 81; three trials; n appeared to be 429).

No significant heterogeneity was found for any of the above analyses.

### **Authors' conclusions**

Measles vaccine and vitamin A treatment were effective interventions to prevent measles mortality in children.

### **CRD commentary**

Inclusion criteria for the review were broadly defined. Several relevant databases were searched without language restrictions. There was the potential for publication bias as the authors did not state if unpublished studies were searched for; publication bias was not assessed due to the small number of identified studies. The authors did not state how many reviewers performed study selection, and quality assessment, but did state that the CHERG guidelines were adhered to, which should minimise error and bias in the review.

The quality assessment indicated the moderate to high quality of the included studies, which strengthened the review. Trials were combined using meta-analysis; heterogeneity was assessed, which was appropriate. However, some of the studies were conducted over 50 years ago, thus the relevance of the review findings to the current situation was unclear.

This issue, together with some of the methodological problems within the review, necessitates caution when interpreting the authors' conclusions.

### **Implications of the review for practice and research**

Practice: The authors stated that the results of this review support the current WHO/UNICEF.

Research: The authors did not state any implications for research.

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