

Preventive zinc supplementation: current evidence, programmatic recommendations and research needs

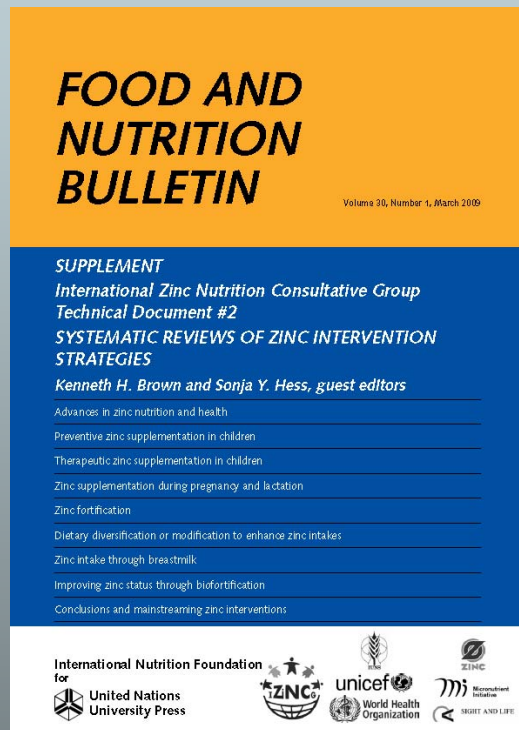
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IZiNCG Satellite Session on Implementing Zinc Intervention Strategies
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Overview of presentation

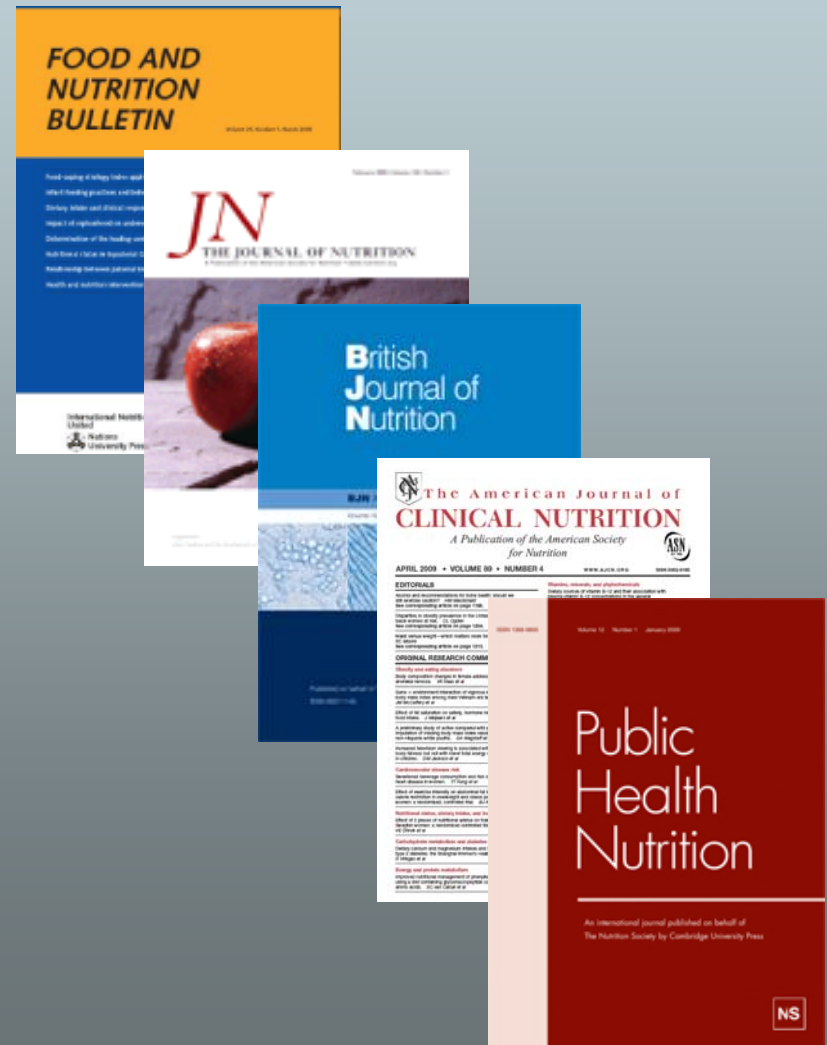


- Methods for systematic review and meta-analyses
- Summary of results
- Implications for zinc intervention programs
- Research needs

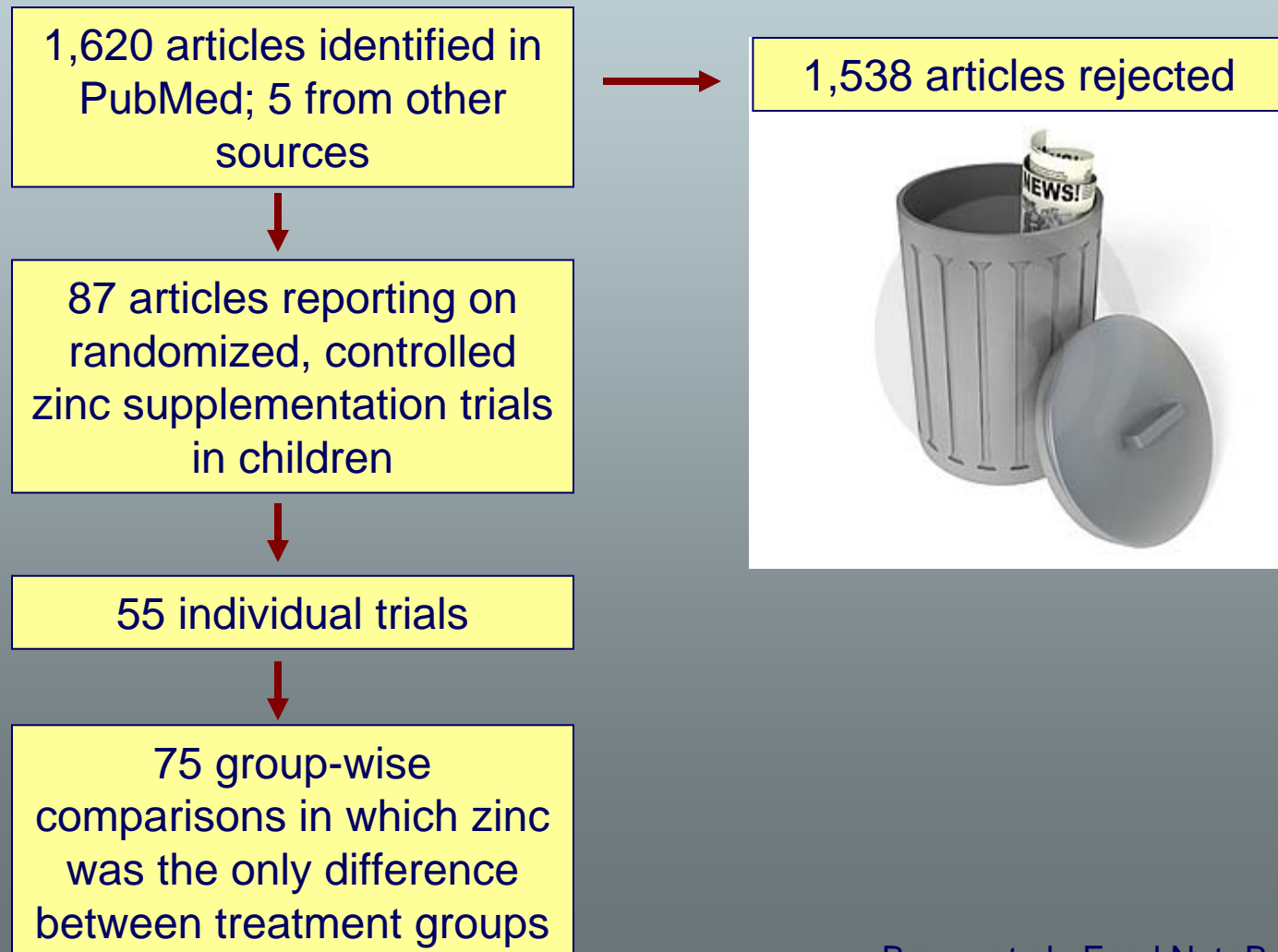
Methods



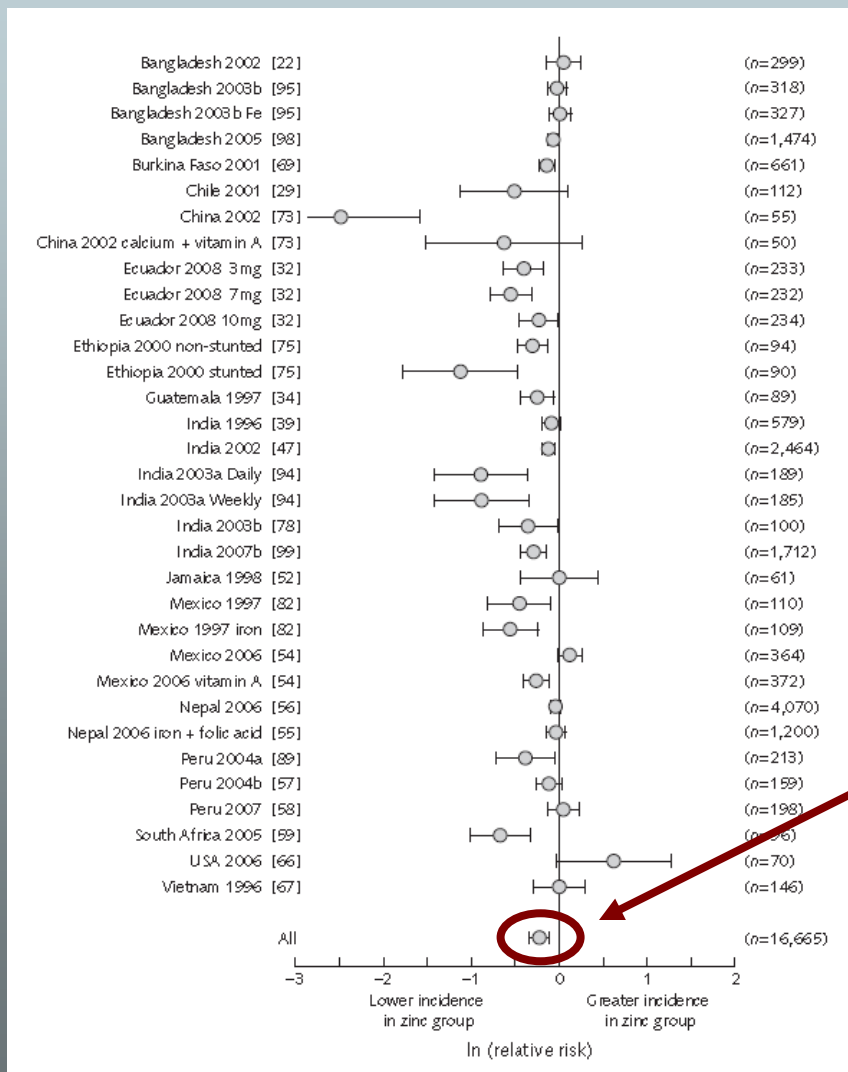
- PubMed search for key word “zinc” – limiting for human studies, clinical trials, and English language
- Abstracts or articles scanned to assess relevance and ensure that zinc was only factor that differed between treatment groups



Selection of articles for systematic reviews



Effect of zinc supplementation on diarrhea incidence (n = 33 comparisons; 16,665 children)

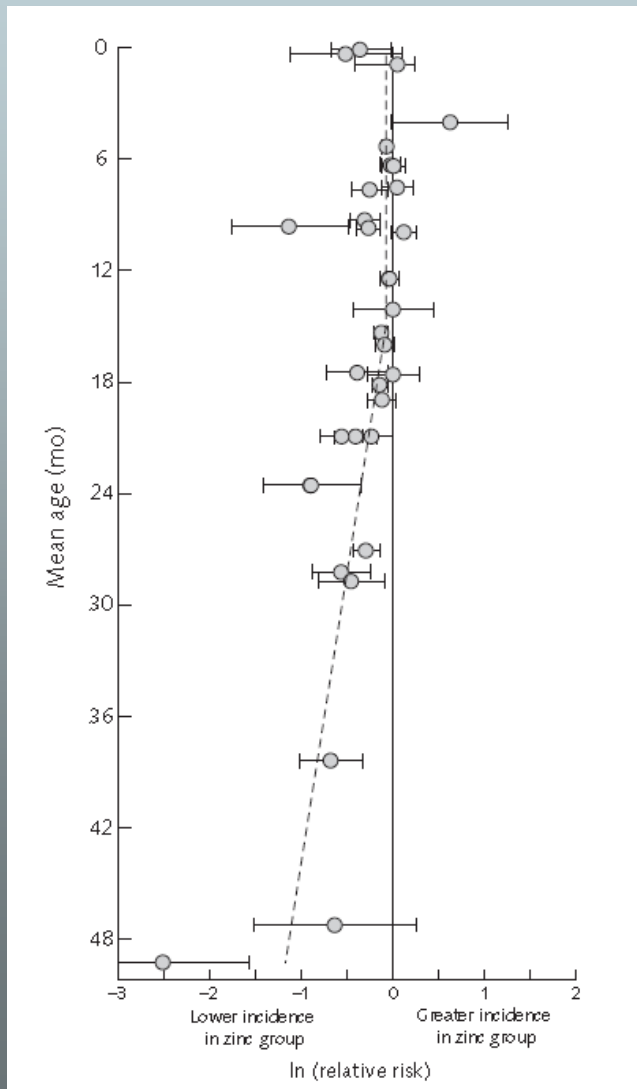


Zinc supplementation produced a 20% reduction in overall diarrhea incidence

RR = 0.80 (0.61, 0.87)
p=0.0004

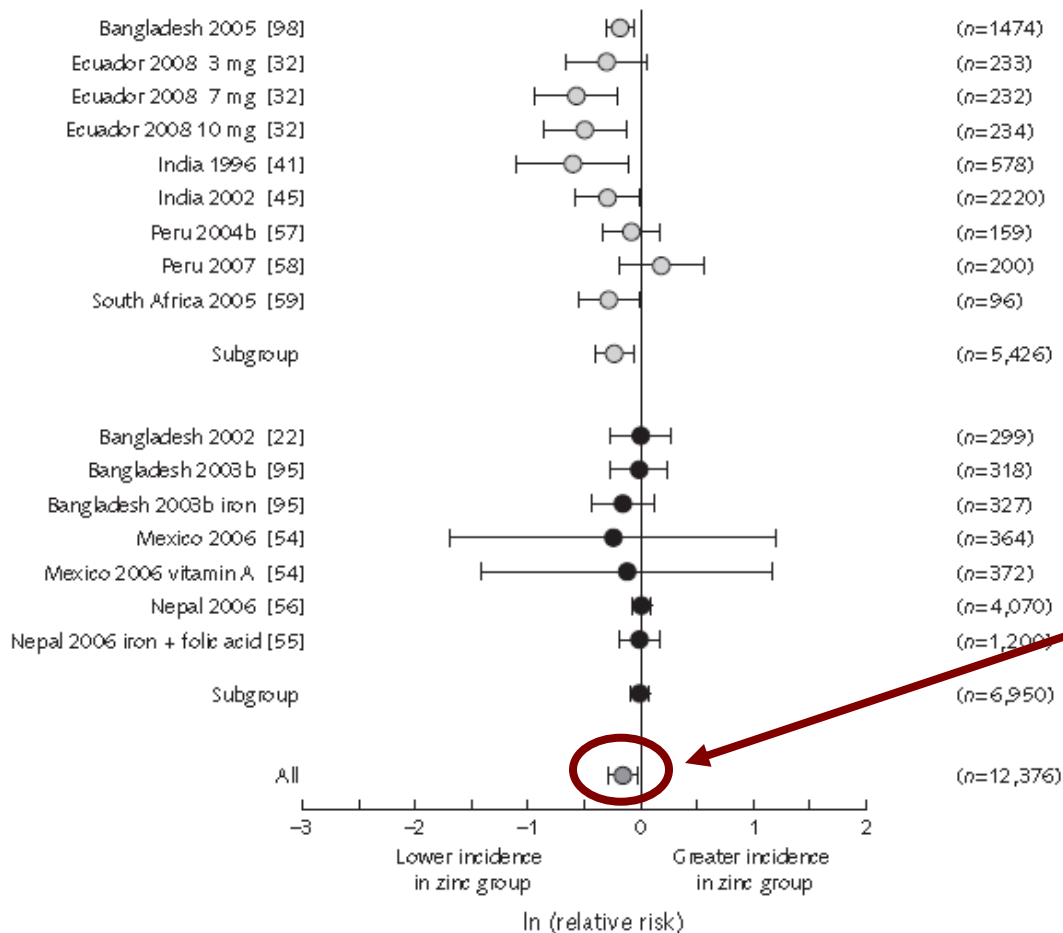
Heterogeneity: age (+);
nutritional status (-);
serum ferritin (+)

Effect of zinc supplementation on diarrhea incidence, by mean initial age of study subjects



The effect of zinc supplementation on diarrhea incidence was restricted to studies that enrolled children with mean initial age >12 months

Effect of zinc supplementation on incidence of ALRI (n = 16 comparisons; 12,376 children)



Zinc supplementation produced a 15% reduction in overall incidence of ALRI

RR = 0.85 (0.75, 0.97)

p=0.017

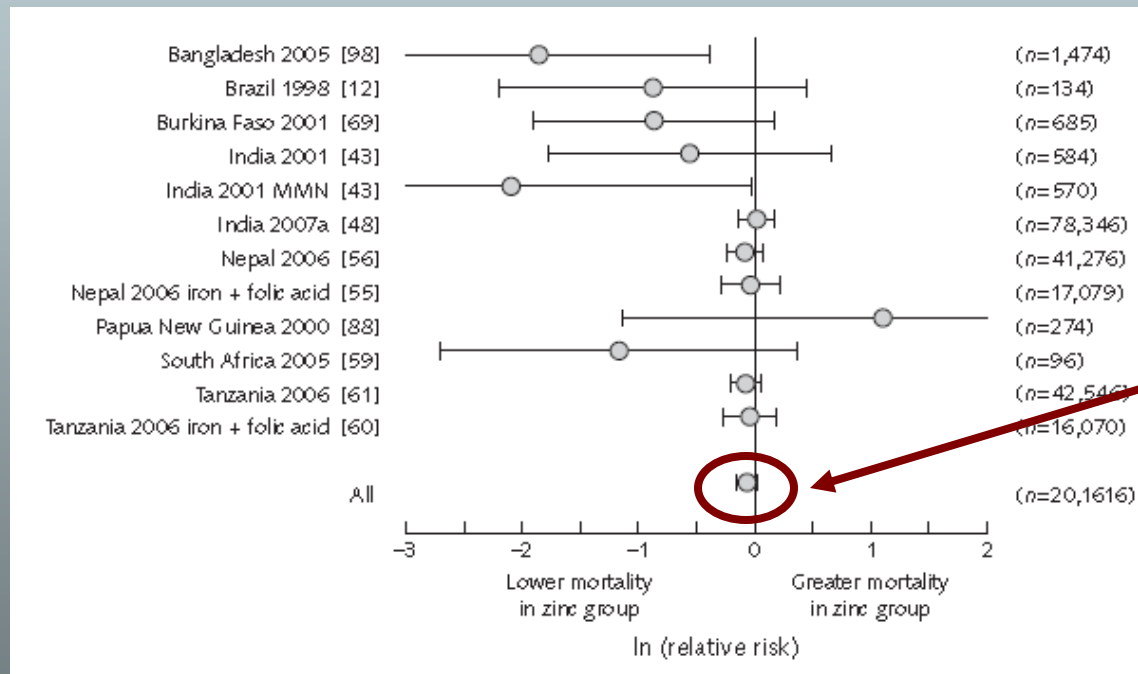
Heterogeneity:
nutritional status (-);
quality of dx (+)

Effect of zinc supplementation on child mortality (n = 13 comparisons; 201,616 children)

Zinc supplementation
produced a 6% reduction
in overall child mortality

RR = 0.94 (0.86, 1.01)

p=0.11



Effect of zinc supplementation on child mortality, by age grp and provision of Fe/FA*

Age group (mo)	Comparison groups	RR	95% CI	p
< 12 (n=54,414)	Zinc vs placebo	1.05	0.91, 1.21	0.52
≥12 (n=29,408)	Zinc vs placebo	0.82	<u>0.70, 0.96</u>	<u>0.013</u>
< 12 (n=65,315)				
≥12 (n=76,162)				

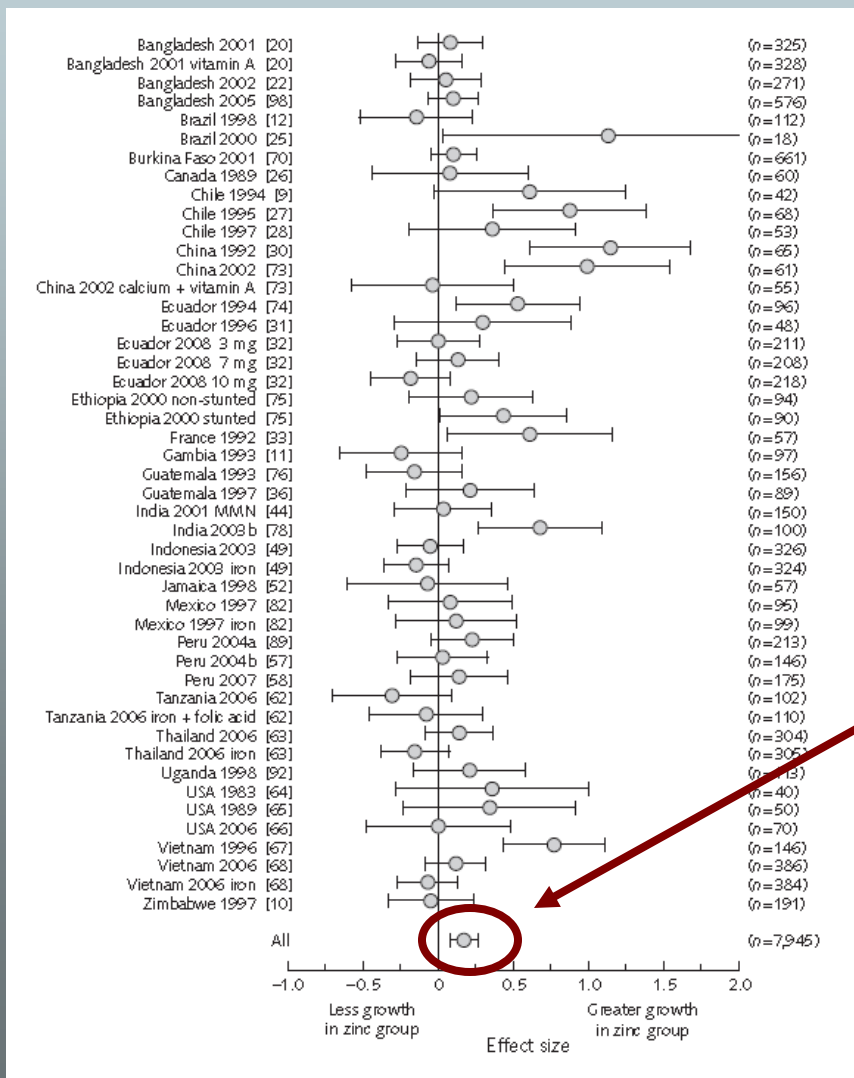
* Data provided by Sazawal S, Tielsch J, Bhandari N. Significant interaction between age group, Fe/FA administration and zinc treatment, p=0.04.

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< 12 (n=65,315)	Zinc + Fe/FA vs Fe/FA	<u>0.97</u>	0.82, 1.15	0.72
≥12 (n=76,162)	Zinc + Fe/FA vs Fe/FA	<u>1.05</u>	0.90, 1.24	0.52

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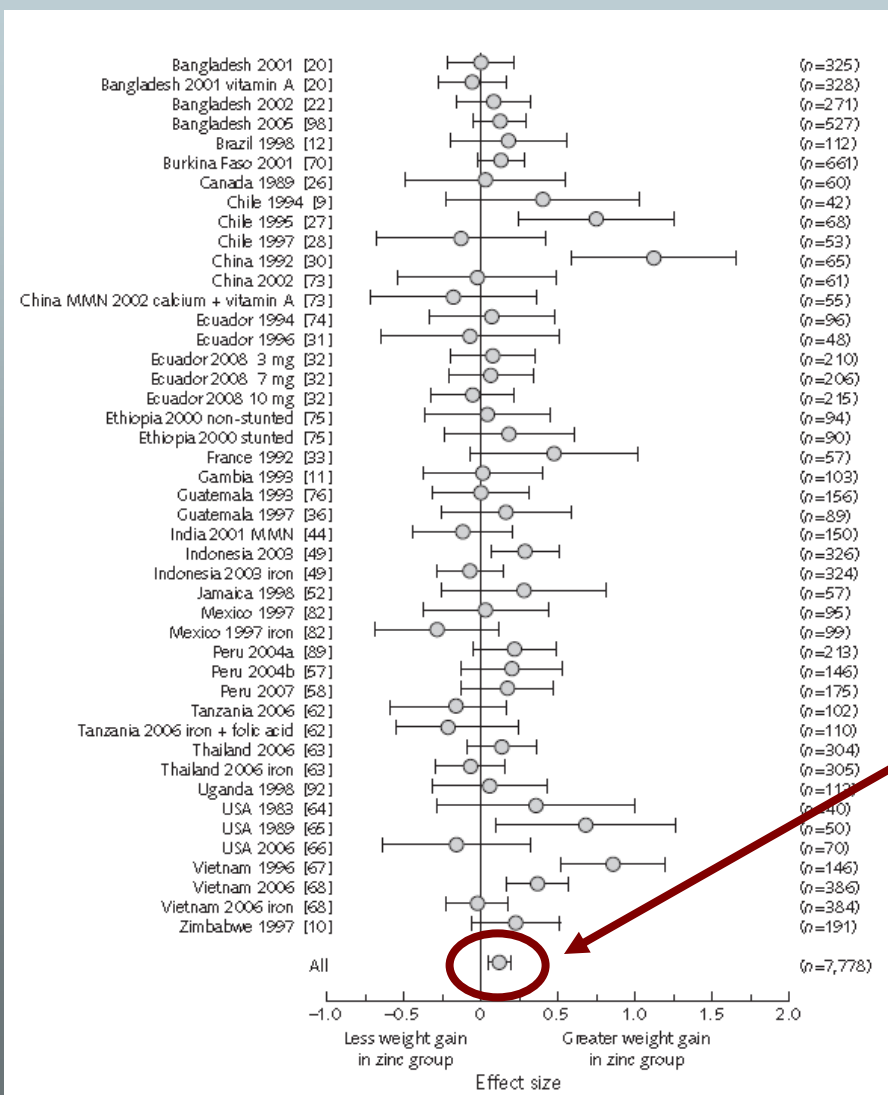
Effect of zinc supplementation on children's linear growth (n = 47 comparisons; 7,945 children)



Zinc supplementation produced a significant increase in linear growth
 Mean effect size = 0.17
 (CI = 0.08, 0.26), p=0.001

Significantly less growth effect when iron or vitamin A supplements also provided

Effect of zinc supplementation on children's weight gain (n = 45 comparisons; 7,778 children)

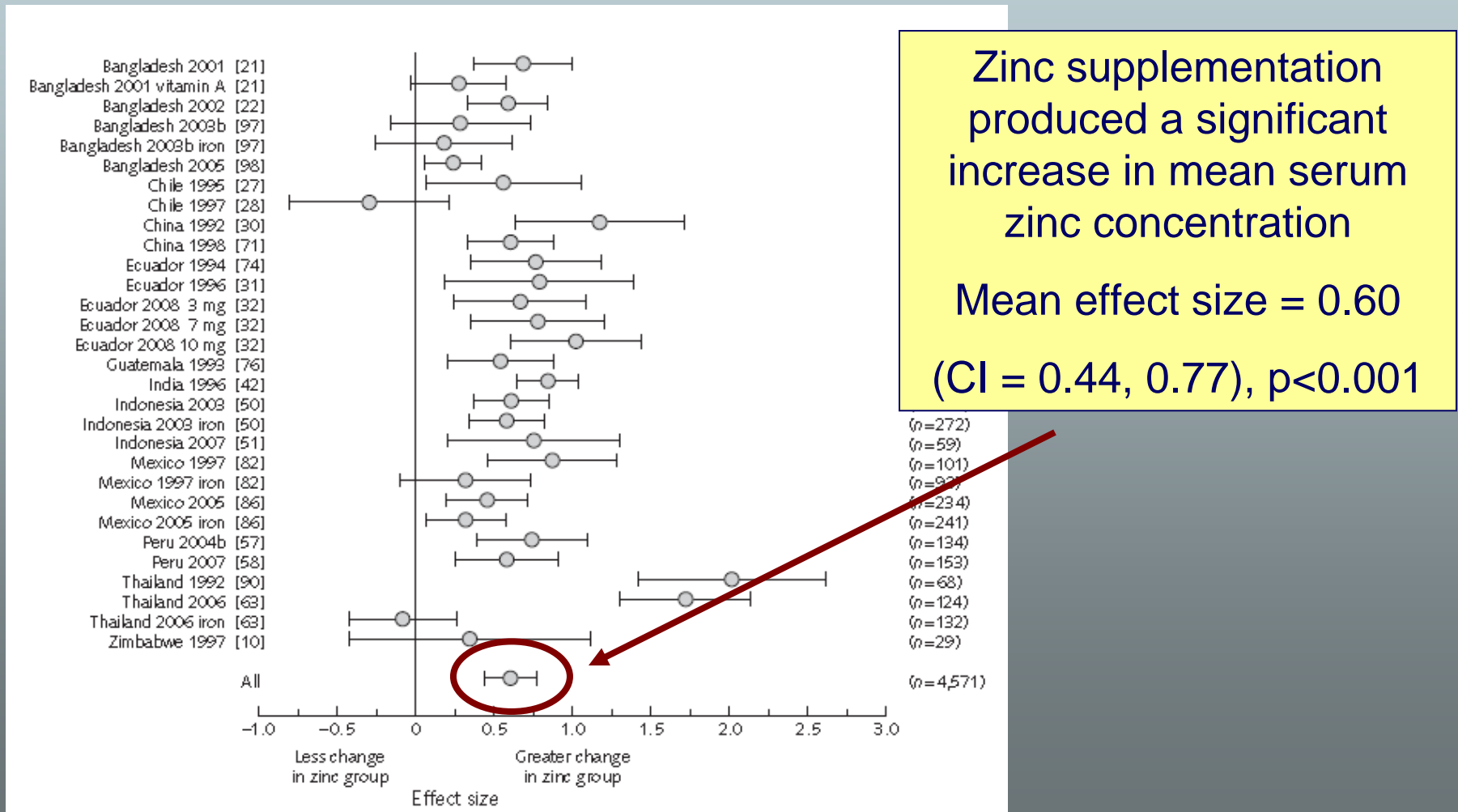


Zinc supplementation produced a significant increase in weight gain
 Mean effect size = 0.12
 (CI = 0.05, 0.19), p=0.002

Significantly less impact on weight gain when iron supplements also provided

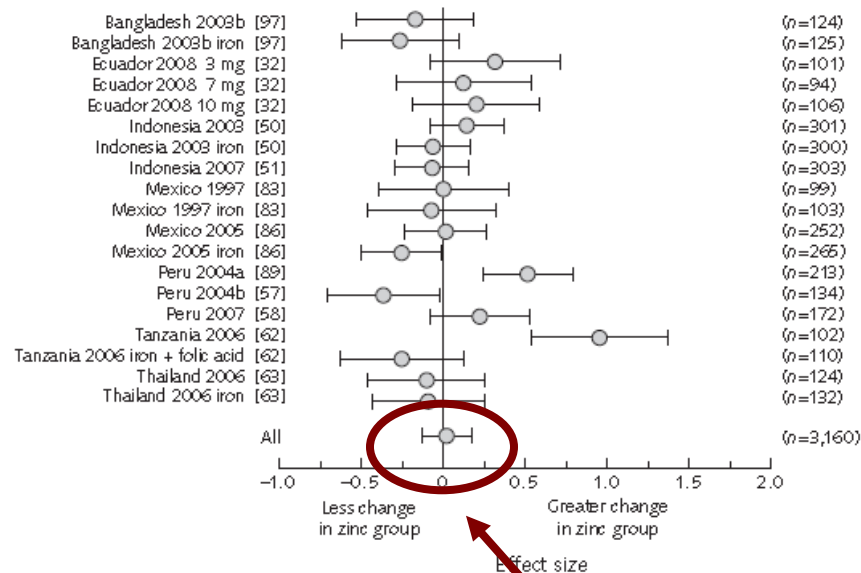
Effect of zinc supplementation on change in mean serum zinc concentration

(n = 30 comparisons; 4,571 children)

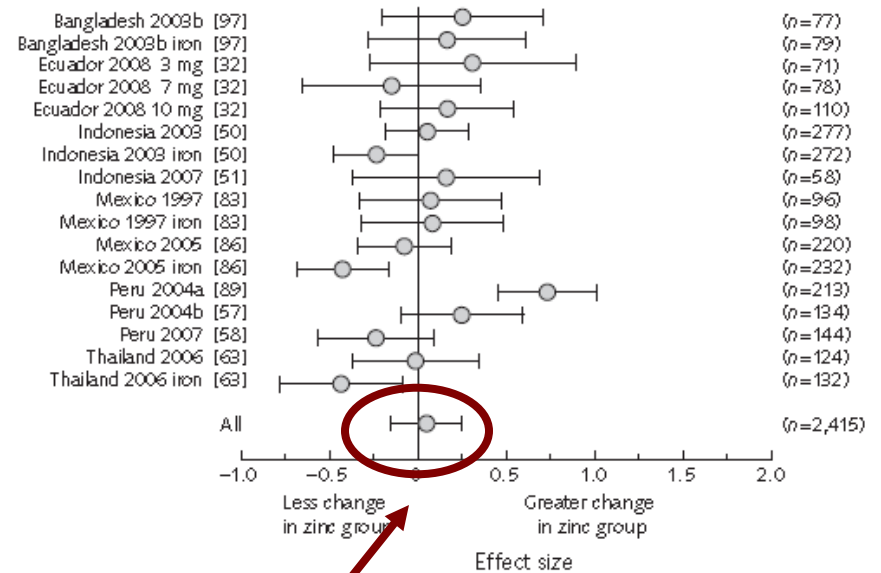


Effect of zinc supplementation on change in mean hemoglobin and serum ferritin concentrations

Hemoglobin (n=19 comparisons)



Serum ferritin (n=17 comparisons)



No effect of zinc supplementation on hemoglobin or serum ferritin

Conclusions

- Preventive zinc supplementation produces:
 - 27% reduced incidence of diarrhea, children >12 mo
 - 15-21% reduced incidence of ALRI (depending on dx)
 - 18% reduced mortality, children >12 mo (when no Fe/FA)
 - Small, highly significant increases in linear growth and weight gain (possibly modified by delivery of Fe, vit A)
 - Moderately large increases in serum zinc concentration
 - Implications for program monitoring
 - No adverse effects on indicators of iron and copper status

Implications for public health programs

- Preventive zinc supplementation is an attractive strategy to directly address MDG 4 (reduction of child morbidity and mortality) and MDG 1 (reduction of child underweight)
- Recommended doses for preventive zinc supplementation have been published (IZiNCG, 2004)
- Available platforms for distribution of preventive zinc supplements include growth monitoring and promotion, CMAM screening, immunization contacts, child health weeks, others

Implications for public health programs

- WHO recommendations for preventive zinc supplementation are urgently needed to help guide and motivate countries
- Additional research is needed on effectiveness and relative cost of different strategies to deliver preventive zinc supplements, with or without other MNs to particular target groups
 - dose, frequency, and duration of supplementation
 - delivery vehicles (tablets, powders, lipid-based products)



Thank you!



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