



# What do we know about cost and impact of nutrition interventions?

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# Overview

- What are the impacts of the 6 WHO nutrition targets (mortality, economic, both?); what are the modelling issues?
- What do we know about the impact of specific interventions for undernutrition?
- What do we know about the cost of specific interventions for undernutrition?
- What do we know about impact re obesity?



# WHA nutrition targets/SDGs

- 1 achieve a 40% reduction in the number of children under-5 who are stunted;
- 2 achieve a 50% reduction of anaemia in women of reproductive age;
- 3 achieve a 30% reduction in low birth weight;
- 4 ensure that there is no increase in childhood overweight;
- 5 Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%;
- 6 reduce and maintain childhood wasting to less than 5%.

# Impact of individual WHA targets: 1

Target	Mortality	Monetary
↓ Stunting	√√	√√
↓ Anemia	√	√√
↓ Low Birth Weight	√√	
↓ Child overweight		√√
↑ Exclusive breastfeeding	√√	√√
↓ Wasting	√√	

Author's assessment

# Impact of WHA targets: 2

- Some of 6 reduce morbidity and mortality (modelled in LiST) – effect strongest in LICs
- Some of 6 reduce health expenditures – effect strongest in HICs
- Some of 6 increase productivity directly (e.g. anemia in adult women) – LMICs
- Some of 6 benefit cognition, hence future productivity (e.g. anemia; breastfeeding) - all



# Mortality vs productivity

- More difficult to model with 2 outcomes, not 1
- Some studies put both into a common metric (\$)
- Copenhagen Consensus papers on nutrition were instructed to use \$1000 and \$5000/DALY
- Similar to WHO guideline that  $< 1$  x per capita income is “very cost-effective” (in 2012, all low income countries had GDP  $<$  about \$1000; all lower middle  $<$  about \$4500): WB cutoffs)



# Mortality vs productivity 2

- Other researchers have evaluated the monetary impact of a death as the discounted present value of future productivity
- Depends on assumptions about future growth rate of the economy, and appropriate discount rate
- Favours richer and fast-growing economies

# Lancet 2013 top 10 interventions

- Balanced energy-protein supplements – moms
- Breastfeeding promotion
- Calcium supplements - moms
- Complementary feeding education (food-secure areas) + food (food-insecure areas)
- Management of moderate-acute malnutrition (MAM)
- Multiple micronutrient supplements – moms
- Therapeutic feeding - severe-acute malnutrition (SAM)
- Universal salt iodization
- Vitamin A for prevention
- Zinc for prevention

Bhutta et al, 2013



# Modelling economic & mortality outcomes

- Morbidity/mortality outcomes have been modelled (LiST for example takes account of interactions)
- Economic outcomes have not been modelled in the same way as epidemiology: RCTs less suitable since behavior is more important (PROFILES – Excel based)
- There are undoubtedly interactions for economic outcomes– cognitive improvements due to reduction in iodine deficiency, iron deficiency and stunting are not necessarily additive
- So some estimate of interaction is desirable

# What do we know about impact of specific interventions?

Knowledge fairly good	Knowledge more limited
Balanced energy supplements moms	
Breastfeeding	Breastfeeding promotion
Calcium supplements moms	Complementary feeding education
Multiple micronutrient supplements	Complementary feeding
Therapeutic feeding SAM	Management of MAM
Vitamin A for prevention	Zinc for prevention?

Author's subjective assessment of literature



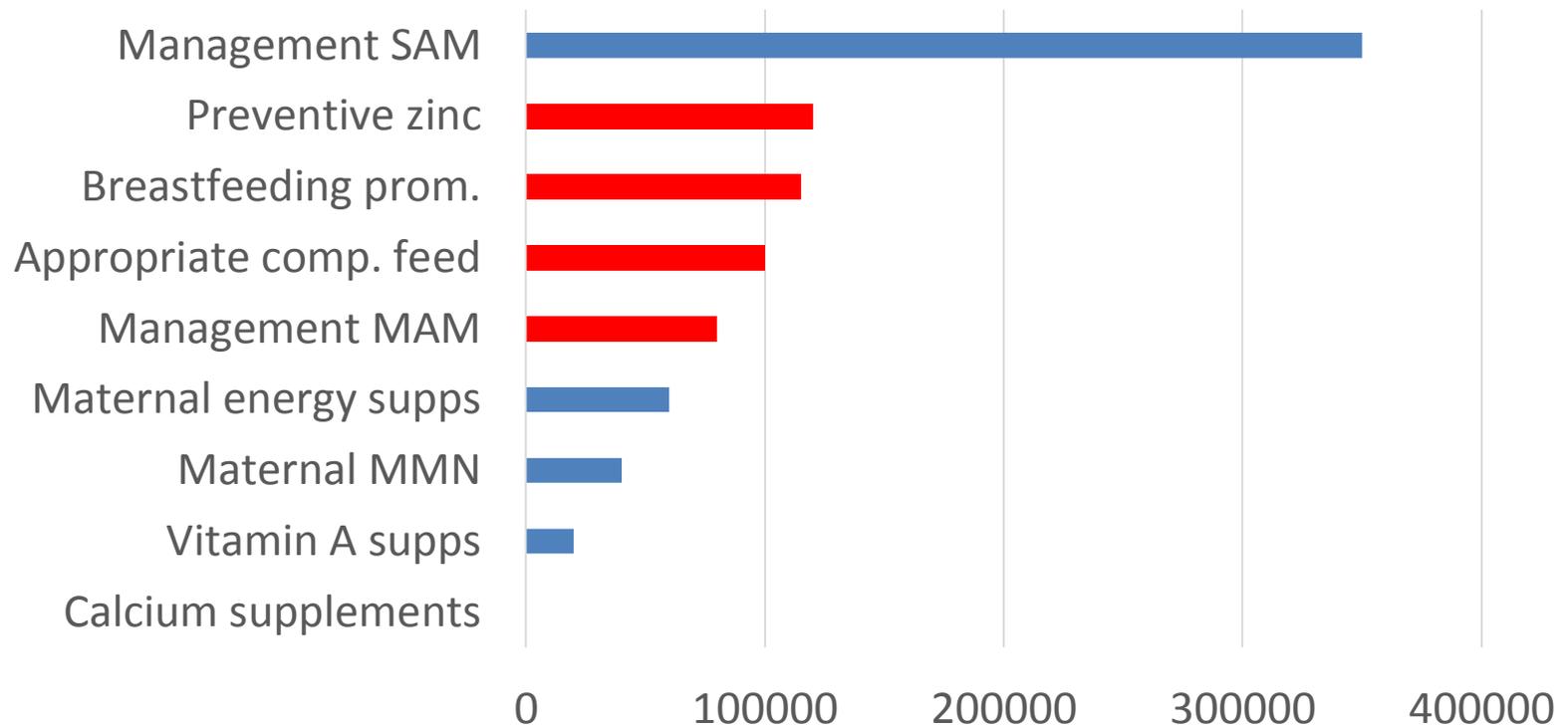
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# Impact – what do we know?

- Our knowledge is better for interventions that require less behavior modification (e.g. micronutrients), and sometimes where there is a commodity (micronutrients, RUTF)
- Our knowledge is more limited where behavior modification is needed

# What we know **better**/**less well** regarding mortality impact?

Number of deaths of children < 5 averted by intervention per yr



Source: Bhutta et al, 2013 (Lancet series)

Red/blue colouring is author's assessment

# What do we know about cost?

- It is not enough to know about what an intervention costs (there are many ineffective interventions) – we need to know what an effective intervention costs
- Easier to cost interventions whose effect is fairly clear (therapeutic feeding for SAM, vit A)
- Harder to cost those involving behavior change (breastfeeding promotion, complementary feeding education, obesity)

# What do we know about cost – 2?

- In some cases we have tried to develop commodities to standardize interventions, e.g. Lipid-Nutrient Supplements (LNS) for complementary feeding; extend use of RUTF/RUSF for MAM; orlistat/gastric surgery for obesity
- This has met with only modest success, so no “magic bullet” for the intervention, hence no easy solution for costing

# Surveys of cost/cost-effectiveness literature

- Systematic review of cost-effectiveness lit 2000-2014 (Horton, Wu, et al, forthcoming 2016) found 33 cost-effectiveness/cost-benefit estimates (in 22 studies) for nutrition interventions
  - 27 for individual micronutrients
  - 1 for a nutrition education program
  - 3 for treatment of SAM
  - 2 for a comprehensive package of interventions

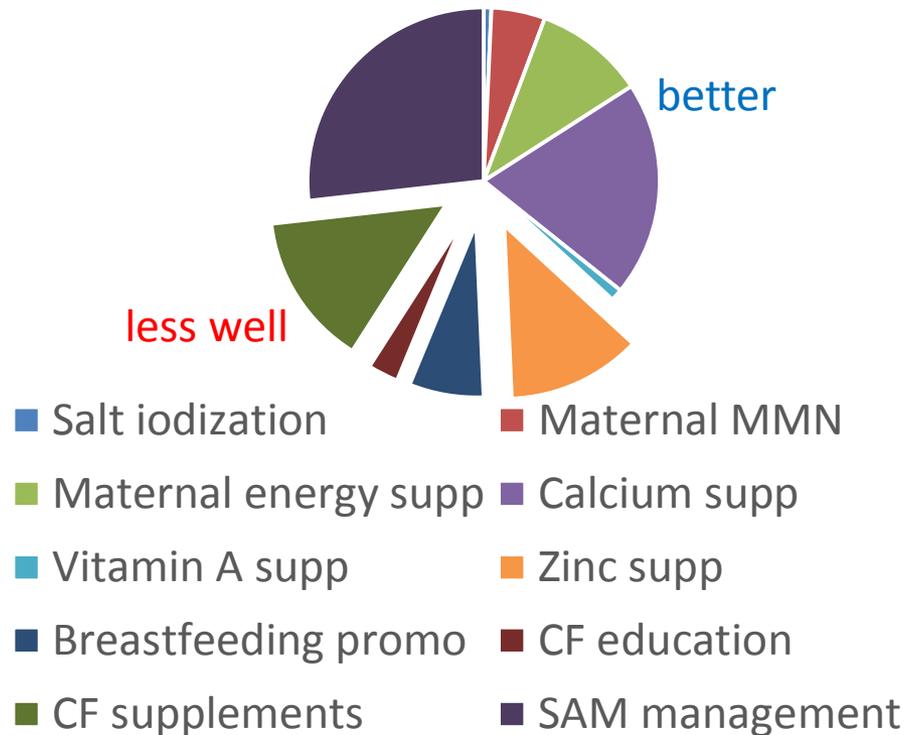
# Our knowledge of detailed delivery costs:

Better	Less good
By region and country	Cost of “last mile”
In different vertical programs	In integrated services
For different food vehicles (fortification)	Cost of national level policy development and mass media campaigns
What is ineffective	How to make programs even more effective

Based on Horton and Levin, forthcoming, 2016

# What we know better/less well regarding cost - mortality?

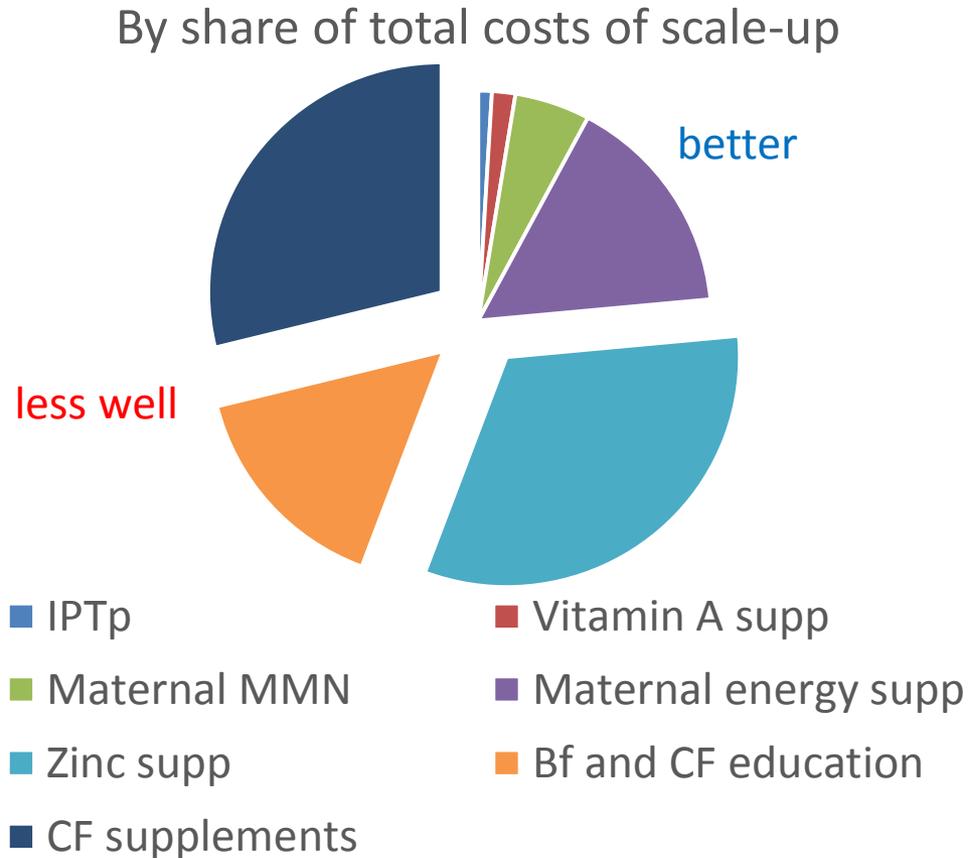
By share of total costs of scale-up



Based on Bhutta et al, 2013 (Lancet series)

Assessment better/less well known cost information is author's

# What we know better/less well regarding cost - stunting?



Based on ongoing work at World Bank on costing WHA targets  
Assessment better/less well known cost information is author's

# Obesity in LMICs

- Literature on cost-effectiveness of interventions regarding obesity in LMICs is very thin
- Identified 3 studies in ongoing work for Disease Control Priorities ([www.dcp-3.org](http://www.dcp-3.org) )
- Our knowledge of what works, what it costs, and how it interacts with policies on undernutrition (double burden) isn't good

# References

- Bhutta, Z. A., J. K. Das, A. Rizvi, M. F. Gaffey, N. Walker, S. Horton, P. Webb, A. Lartey, R. E. Black for Lancet Maternal and Child Nutrition & Interventions Review Groups Evidence based interventions for improving maternal and child nutrition: what can be done and at what cost? Lancet 382 (9890): 452-477, 2013.
- Horton, S. and C. Levin. Cost-effectiveness of interventions for reproductive, maternal, newborn and child health. In R. Black, R. Laxminarayan, M. Temmerman and N. Walker. *Disease Control Priorities (3<sup>rd</sup> edition): Volume 2, Reproductive, Maternal, Newborn and Child Health*. Washington DC: World Bank. Forthcoming, 2016.
- Horton, S., D.C.N. Wu, E. Brouwer and C. Levin. Methodology and results for systematic search, cost and cost-effectiveness analysis: RMNCH Volume. Disease Control Priorities Working Paper no. x, forthcoming 2016.



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# Comments, questions?



Photo credit: MEDA Canada, Masava project