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Ex-ante model for analysing health benefits of biofortification

the framework for beta-carotene

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Larger framework of analyses

- Iron, zinc and vitamin A deficiencies
- Anticipated benefits from the consumption of biofortified rice, wheat, maize, cassava, sweet potato & beans
- in Bangladesh, Brazil, DR of Congo, Honduras, India, Kenya, Nicaragua, Nigeria, Pakistan & the Philippines

Method

Disability-adjusted life years (DALYs)

- measure health across different diseases and severity levels
- take account of the duration of a disease
- incorporate premature death

Diseases & target groups

- Nightblindness: children $\leq$ 5 years, pregnant & lactating women
- Corneal scars: children $\leq$ 5 years
- Blindness: children $\leq$ 5 years
- Measles: children $\leq$ 5 years
- Increased mortality: children $\leq$ 5 years

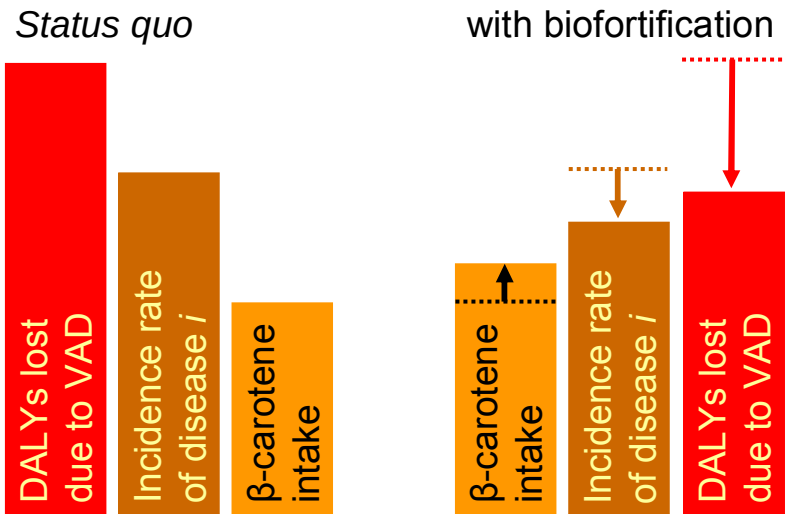
Incidence attributable to VAD

• Nightblindness	100%	of all causes
• Corneal scars	10%	of all causes
• Blindness	10%	of corneal scars
• Measles	20%	of all causes
with complications	50%	of measles
• Mortality	3%	of all causes

Duration & severity

	Duration	severity-weight
• Nightblindness		
- children	12 months	0.05
- pregnant women	5 months	0.1
- lactating women	6 months	0.1
• Corneal scars	permanent	0.2
• Blindness	permanent	0.5
• Measles	10 days	0.35
with complications	20 days	0.7

Impact of biofortification



Cost-effectiveness

Disaggregation of costs

- Basic research and development costs
- Country-specific adaptive breeding, dissemination and extension costs
- Costs for maintenance breeding

Cost-effectiveness

- Juxtaposing total costs and DALYs saved gives the cost-effectiveness in:

  US$ per DALY saved

- This is the cost of saving one healthy life year through biofortification

Cost-effectiveness

- Preliminary results for iron-rich cereals: 0.5 - 1 US$/DALY (rice & wheat, India)

- World Development Report: "highly cost-effective" if intervention costs less than 150 US$ per DALY saved

Conclusion

- This model can be used to determine the burden of VAD

- and to analyse whether biofortification
  1.) has an impact on the burden of VAD
  2.) can be expected to be cost-effective

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Thank you

for your attention!

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