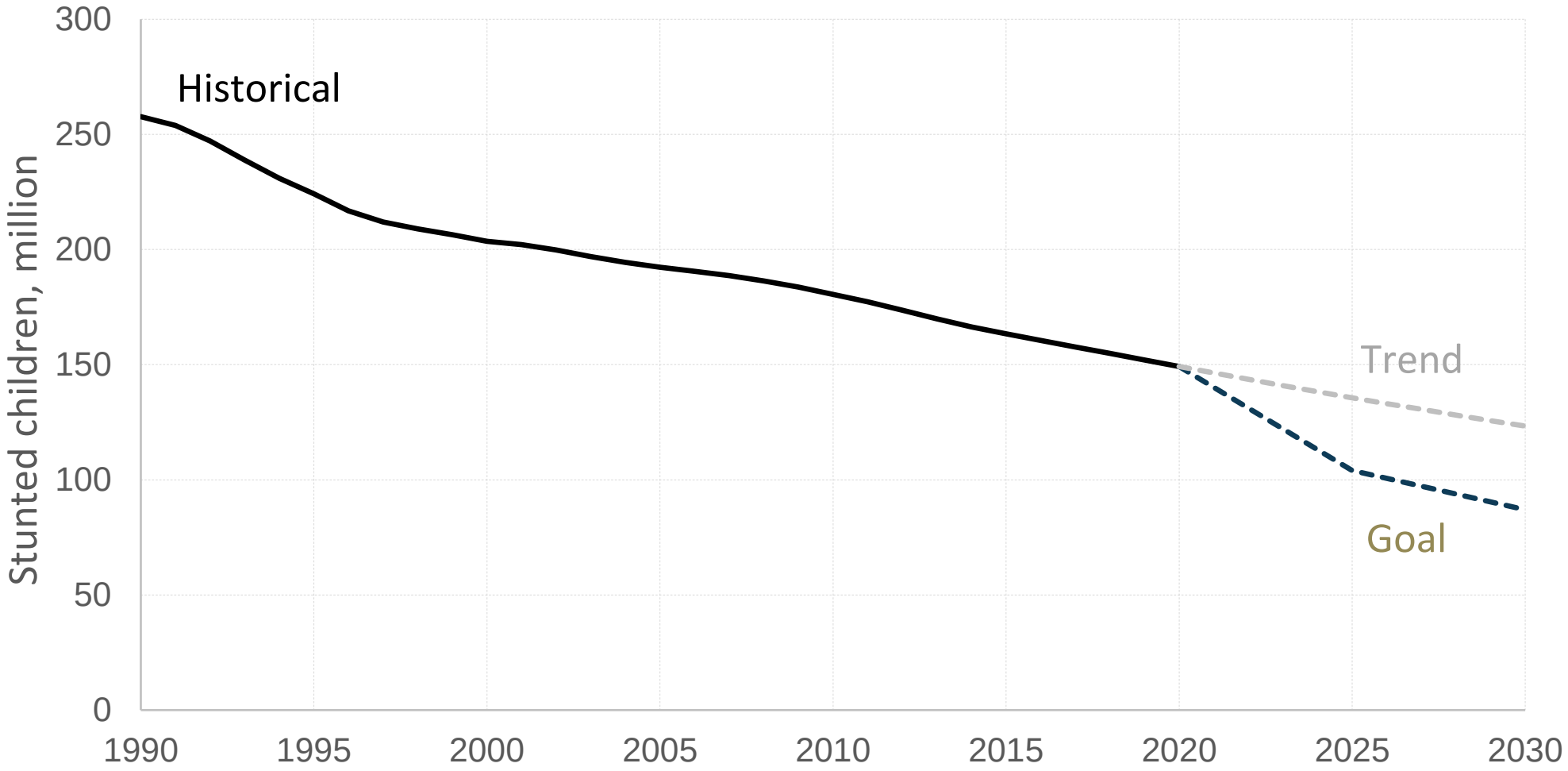
Nutrition:
Brain development
and valuing life-long effects

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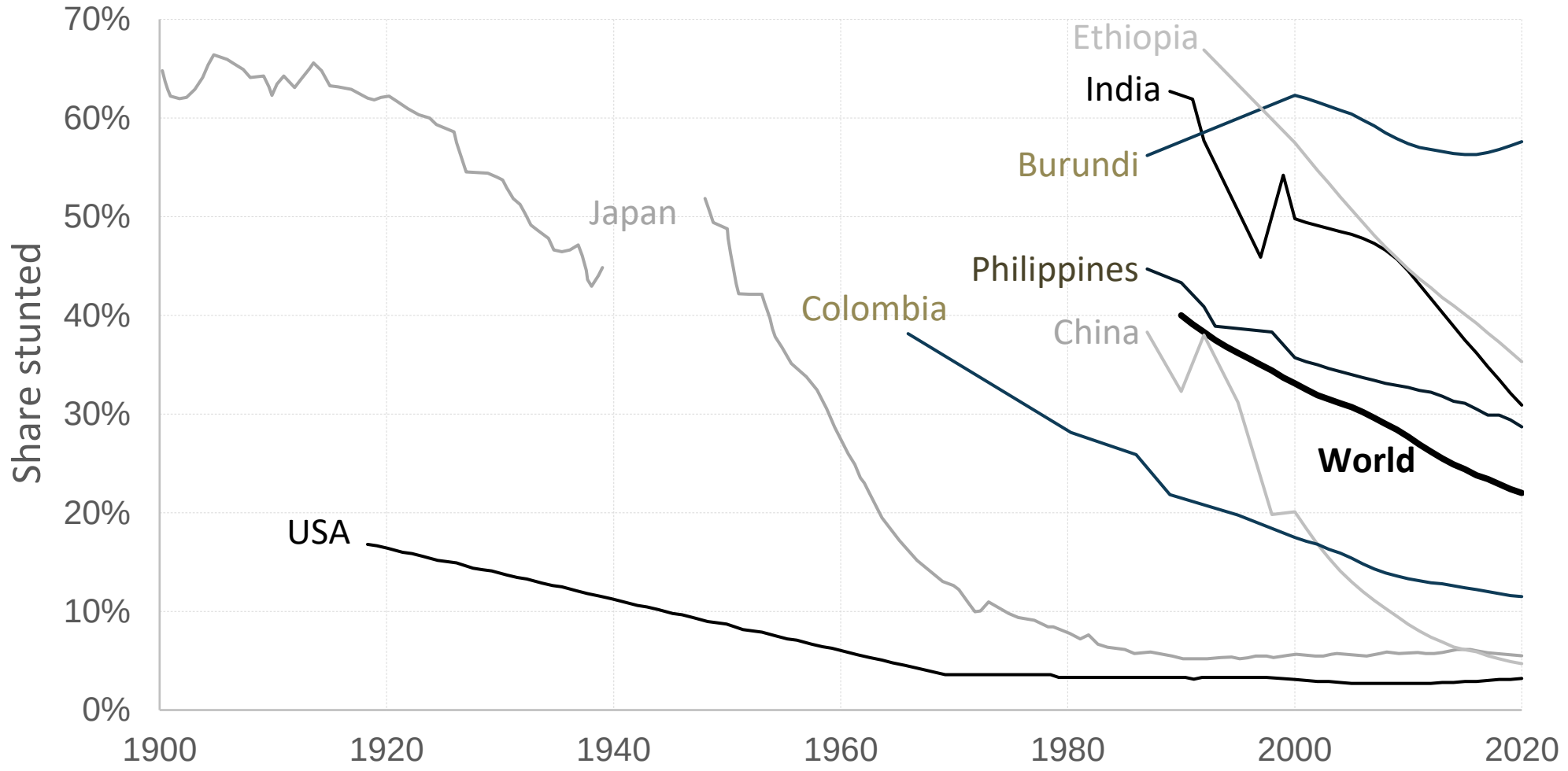
Johannesburg, 15th July 2026

Global number of stunted children



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Stunting of children under five years of age



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The 1,000 Days Window

- Conception to 2nd birthday: Critical period
- Brain development most rapid
- Nutritional deficits hard to reverse after age 2
- Intergenerational effects: Malnourished mothers → stunted babies
- Window of opportunity for intervention

NUTRITION - JAMAICA STUDY: Overview

- Landmark longitudinal study (1986-present)
- Followed stunted children from age 9-24 months
- Combined nutrition supplementation + stimulation
- 40-year follow-up shows sustained benefits
- One of most influential studies in development economics

Jamaica Study: The Intervention

- Weekly home visits for 2 years (age 9-24 months)
- Nutritional supplementation (1 kg milk-based formula/week)
- Psychosocial stimulation (play activities, parenting)
- Four groups: Nutrition only, stimulation only, both, control
- Low-cost intervention: ~$1,500 per child total

Jamaica Study

Short-Term Results

- Stimulation group: Caught up to non-stunted children in development
- Nutrition alone: Some benefits but smaller
- Combined intervention: Strongest effects
- Effects on cognitive development, language, motor skills
- Benefits visible within months of intervention

Long-Term Results (Age 22)

- 42% higher earnings for stimulation group
- Equivalent to catching up to non-stunted peers
- Better education outcomes (more years completed)
- Lower depression and antisocial behavior
- Effects sustained into adulthood

Jamaica Study: Benefit-Cost Analysis

- Cost: ~$1,500 per child (2-year intervention)
- Benefits: 42% lifetime earnings increase
- BCR estimates: 6-17 depending on assumptions
- Wider social returns: Health, crime reduction, productivity

Nutrition

NUTRITION

HALFTIME
FOR THE SUSTAINABLE
DEVELOPMENT GOALS



BEST INVESTMENTS FOR THE SDGs

EXCELLENT BENEFIT COST RATIO: 18

Investment

Complementary feeding promotion for mothers with children 6–23 months.
Multi-micronutrients and calcium supplements to the 40% of pregnant women, that currently take iron and folic acid supplementation.

Authors

John Hoddinott, Cornell University
Bjorn Larsen, Consultant
Saleema Razvi, Copenhagen Consensus Center

Nutrition in pregnancy

- Multi-micronutrient supplementation in pregnancy
- Calcium in pregnancy
- Complementary feeding promotion

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Multi-micronutrient supplementation in pregnancy

	Multi-micronutrient pill, additional cost	$56
	Healthcare system, education, and training	$40
	Total costs per year	**$97**
	Stillbirths, 47,000 avoided	$108
	Early births, lower productivity for 228,000 avoided	$491
	Low birth weight, lower productivity for 1,4 million	$3,030
	Total benefits per year	**$3,629**

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Note: Costs and benefits are discounted at 8% per year.

Calcium in pregnancy

	Calcium pill, additional cost	$248
	Total additional costs	**$248**
	Stillbirths, 81,000 avoided	$186
	Early births, lower productivity for 693,000 avoided	$1,613
	Low birth weight, lower productivity for 423,000 avoided	$958
	Eclampsia and pre-eclampsia avoid 8,470 maternal deaths	$1,817
	Total benefits	**$4,601**

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Note: Costs and benefits are discounted at 8% per year.

Complementary feeding promotion

	Healthcare workers	$444
	Value of mothers' time	$145
	Cost of incremental food consumption	$289
	Total costs	**$878**

	Avoided deaths	$2,659
	Higher productivity	$11,294
	Total benefits	**$13,953**

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Note: Costs and benefits are discounted at 8% per year.

CBA toolkit: Adding up health and education impacts

Complementary Feeding Promotion (CFP)

- Effectiveness evidence
  - **Lassi et al. (2020): HAZ ↑ 0.25 in food-secure settings**
  - **Panjwani & Heidkamp (2017): LAZ ↑ 0.22**
  - **Mahumud et al. (2022): HAZ ↑ 0.19 (mixed settings)**
  - **Ahmed et al. (2019): HAZ ↑ 0.25 with BCC + cash transfer in resource-poor settings**
- Choice of effect size:0.25 HAZ for both SES groups
  - **For lowest SES: assumes cash transfer + BCC**
  - **For highest SES: assumes BCC only, but same effect size due to higher baseline food security**
- Mortality reduction:
  - **Derived indirectly using Olofin et al. (2013) relative risks and estimated stunting reductions**

Costing Perspective

- A societal perspective is used:
  - **Program costs**
  - **Household time costs**
  - **Private food expenditures (CFP)**
  - **No inclusion of broader macroeconomic spillovers**
- All costs expressed in 2022 US$.

CFP Costs: Lowest 3 SES quintiles

- Weekly group sessions (Ahmed et al., 2019)
  - **Promotion program cost: US$ 37.50**
  - **Mother's time cost: US$ 24.00**
- Incremental complementary food cost (Bai et al., 2021)
  - **Nutrient-adequate diet cost**
  - **250 kcal/day incremental food**
  - **Cost over 18 months: US$ 71**
  - **Applied only to responders (assumed = stunting prevalence = 41%)**
- Total cost per responding child: US$ 221

CFP Costs: Highest 2 SES quintiles

- One visit every 2 months
  - **Promotion cost: US$ 18.65 (instead of US$ 61.50)**
- Incremental food: 125 kcal/day → US$ 36
- Response rate = 26%
  - **74% don't change diet for their children due to promotion**
- Total cost per responding child: US$ 108 (instead of US$ 221)

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Qunatifying Benefits

Productivity Gains from Averted Stunting

- Each averted stunting case → 30% increase in lifetime income
  - **Based on Hoddinott et al. (2008, 2011)**
- Lifetime income estimated separately, discounted at 8%:
  - **Lowest 3 SES quintiles**
  - **Highest 2 SES quintiles**

Mortality Benefits

- Infectious disease mortality reduction
  - **3 lowest SES quintiles: 37,521 deaths avoided x life years lost x VSLY**
  - **2 highest SES quintiles: 10,558 deaths avoided x life years lost x VSLY**
- Mortality valuation
  - **U.S. VSL = US$ 9.4M (2015)**
  - **Income elasticity = 1.5**
  - **VSL transferred to LICs/LMCs using GDP per capita ratios**
  - **VSLY = VSL / (½ life expectancy)**
  - **VSLY grows over time with GDP growth, life expectancy**
  - **Examples (constant 2021 US$): 2025 VSLY: US$ 5,049, 2030 VSLY: US$ 6,062**

Cost Benefit Ratios

Cost Benefit Ratios

- 3 lowest SES quintiles
  - **Benefits US$ 27,988**
  - **Costs US$ 3,748**
  - **BCR 7**
- 2 highest SES quintiles
  - **Benefits US$ 12,160**
  - **Costs US$ 765**
  - **BCR 16**

- In the 3 lowest SES quintiles
  - **Mortality benefits are nearly 60 % of total benefits**

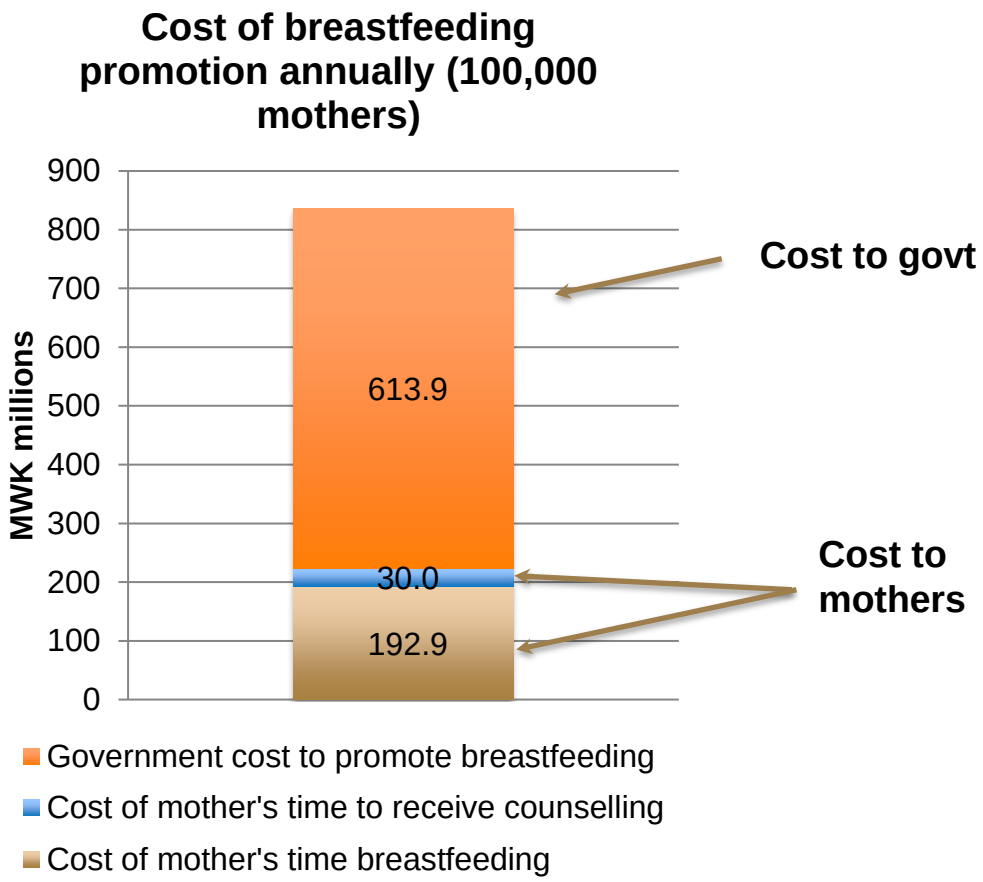
- In the 2 highest SES quintiles
  - **Productivity or income gains are about 80 % of total benefits**

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Breastfeeding promotion

Malawi

Breastfeeding promotion in Malawi could reach 100,000 mothers



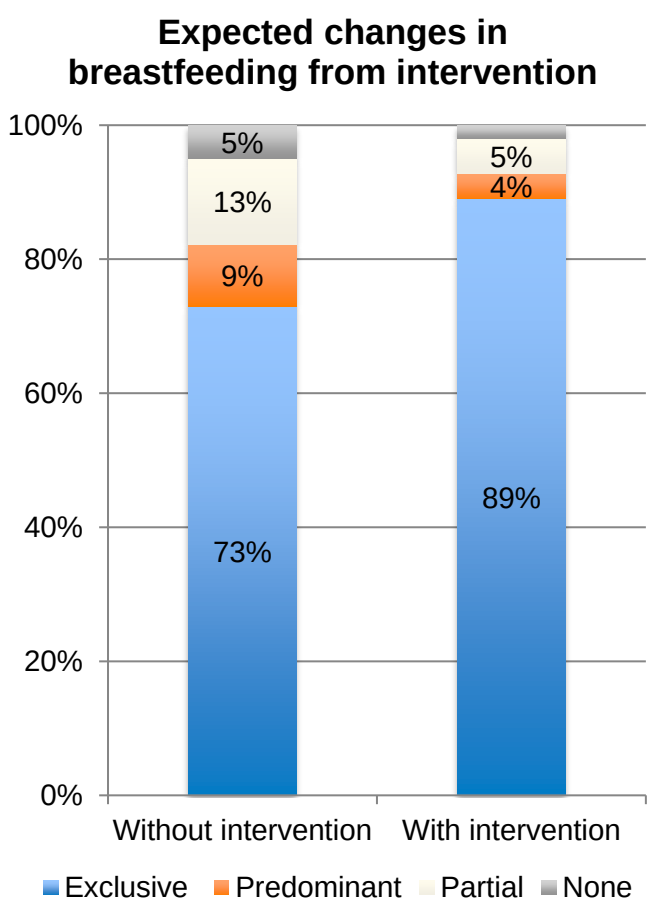
Target population

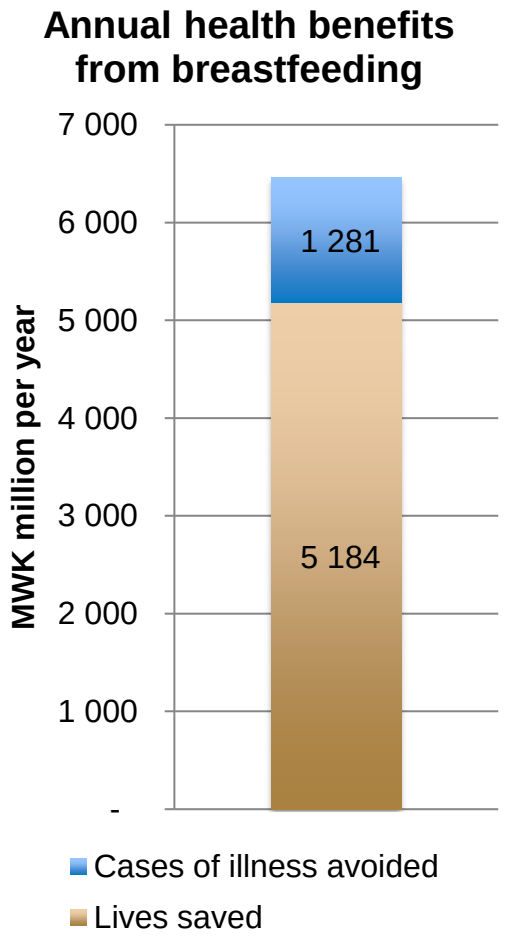
- 100,000 more women (15% of mothers)

Costs = MWK 822m p.a.

- Direct cost of breastfeeding promotion is MWK 6,139 per woman
- Assumed to require 6 consultations of 30 min each
- Breastfeeding promotion would lead to 10,575 new women spending an extra **1 hour a day** on breastfeeding and associated inconvenience

Intervention would lead to 16,089 extra women exclusively breastfeeding and 446 lives saved





BCR = 7.9

Benefits = MWK 6,465m

- 22% increase in likelihood of EBF -> 16,089 extra women exclusively breastfeeding
- 11% increase in likelihood of continued breastfeeding -> 8,754 continuing to breastfeed to 24 months
- 446 lives saved per year from reduced infection
- 77,000 cases of respiratory infection avoided over 2 years
- 31,000 cases of diarrhea avoided over 2 years
- Benefits drawn from correlative studies between breastfeeding and child illness or mortality around the world

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CBA toolkit: Additionality, only analyze the change

Counterfactuals, transfers and scarce public resources

The policy is valued against BAU not against zero

- With policy – Business as usual = Incremental change
  - **BAU includes existing services, spending, trends and reforms already expected**
- Only differences caused by the policy enter the CBA
  - **Existing costs and benefits continue under BAU unless the policy changes them**
- If a relevant item does not change
  - **No change → not counted in CBA**

A transfer changes who holds money not total resources

- A transfer reallocates purchasing power within society.
- Common transfers
  - **Cash grants**
  - **Fee relief**
  - **Subsidies**
  - **Taxes and rebates**
  - **Pensions**
- In strict social accounting
  - **The payment and receipt cancel**

Government payments are not all the same

Payment	What matters economically
Cash transfer or fee relief	Transfer between government and recipient
Salary payment	Worker time is a real resource cost
Procurement payment	Goods or services are real resource costs
Tax or subsidy	Transfer, plus possible administration and behavior effects

Public money are scarce, make transfers visible as government cost and corresponding benefit

- **Incremental government outlay = Cost**
- **Corresponding value to the recipient = Benefit**
  - **For procurement or services, the benefit is the beneficiary outcome, not supplier revenue (avoid double-counting)**
- Strict social BCR not suitable for policy-prioritization
- Instead
  - **Keep government costs visible in the calculation**
  - **Matched transfers leave NPV unchanged but can change the BCR**

Example: Abolishing school fees
What changes?

Group or input	What changes?	CBA treatment
800 BAU fee-paying pupils	Fees stop; government replaces revenue	Government cost + fee-relief benefit to families
100 additional pupils	Enroll only because of the policy	Extra service cost + education benefit; but no fee relief compared to BAU
Existing teachers/buildings	May continue unchanged	Count only additional use or cost
Education of existing pupils	Continues under BAU	Not counted unless attendance, quality or learning changes

Common mistakes

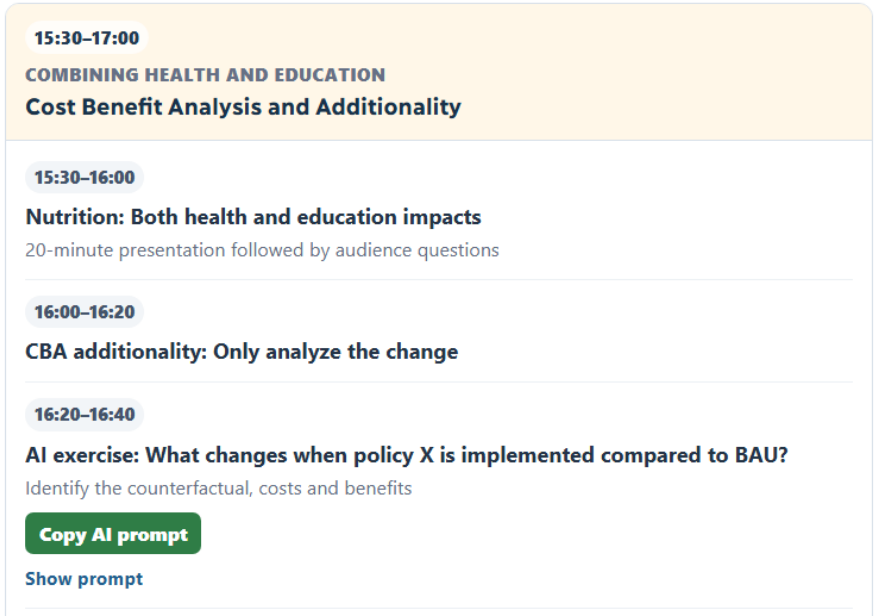
- Comparing the policy with nothing
  - **The correct comparison is with what would otherwise happen**
- Counting the whole program instead of the change
  - **Existing costs and benefits normally belong to BAU**
- Large government costs are “hidden” as transfers
  - **New government expenditure is a cost; corresponding value to recipients is a benefit**
- Double counting
  - **Do not count both an intermediate outcome and the final benefit, or government expenditure and the same purchased inputs twice.**

Analyze a policy, reform or intervention: What changes? What are the costs and benefit?

AI guided exercise

Copy prompt in the conference program

- Use QR code or go to
  - **copenhagenconsensus.com/johannesburg-july-202(**
- Scroll down to
  - **Day 1 at 16:20**
- Click on “Copy AI prompt”
- Open your favorite AI app
- Paste the prompt



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Copy prompt in the conference program

Create an incremental CBA for the policy/program I provide versus business as usual (BAU). Ask first if the intervention or BAU is unclear.

Make a 3-column "What Changes?" table: Before/BAU | After/implementation | CBA comment. Use one row per mechanism, rule, incentive, behavior, cost, or benefit. In the comment state what changes, its type (cost, benefit, transfer, saving, or not counted), who bears/receives it, and why it matters. Include only differences. For a relevant unchanged item write: "No change -> not counted in CBA."

Use ONE broad policy-prioritization BCR:

All additional government spending and material revenue losses are costs; corresponding value to recipients is a benefit.

For cash transfers, fee relief, or subsidies, show government cost and recipient benefit symmetrically unless evidence supports another value.

For procurement/services, count government outlay as cost and the actual beneficiary service/outcome as benefit; supplier revenue is not an extra benefit.

Government savings are benefits; show corresponding losses to others.

Include material private, compliance and opportunity costs, behavioral/distributional effects, and externalities.

Avoid double counting outlays and the inputs they buy, or intermediate and final outcomes.

Show major components separately.

After the table give: (1) brief quantification ideas and data sources, including relevant elasticities, fiscal effects, externalities, DALYs/VSL, time, or productivity; and (2) a CBA block listing government costs/savings, other costs and bearers, benefits and recipients, transfers on both sides, methods, sources, uncertainties, and sensitivity parameters.

Use concise technical language and separate evidence, assumptions, and judgment. Clearly distinguish sourced data from assumptions and label all limitations.

Policy/program: [insert here]

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Day 1 recap: Learning the core CBA toolkit

Doing the best things first with transparent CBA

Day 1 built one complete decision chain

- Compare options, not just good causes
- Look for credible evidence for causal effect
- Translate learning and health outcomes into monetary benefits
- Annualize capital costs and discount future streams to present value
- Compare the policy with BAU and count only what changes
- Report BCR, complement with NPV and the main uncertainty

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Learning gains raise lifetime income

- Effects
  - **Use credible causal evidence**
  - **Measurable learning gains (e.g. test scores)**
  - **Additional cost per learner**
- Valuation
  - **Translate learning gains into an earnings**
  - **Affected cohort's age-earnings profile**
  - **Discount future earnings to present value**

Value of Health is DALYs x VSLY

- Health
  - **DALYs combine disability and premature mortality**
  - **Value of Statistical Life (VSL) values small mortality-risk reductions**
  - **VSLY values life-years gained**
- Nutrition
  - **The first 1,000 days affect survival, cognition and growth**
  - **Value health and productivity effects**
  - **But, only count health and income benefits once**

Additionality keeps the CBA focused
Only count changes from BAU

Before / BAU	After policy	CBA treatment
Existing service continues	No material change	Not counted
Current resources and outcomes	New staff, inputs or capital	Additional resource cost
Existing outcome trend	Incremental learning or health gain	Benefit if attributable
No new transfer	New cash, subsidy or fee relief	Show government cost and recipient benefit

For every policy, ask: What changes - and what are the additional costs and benefits?

Then annualize, discount, test uncertainty, and report NPV and BCR