Maternal and Child Health Harvard-Tanzania Collaboration

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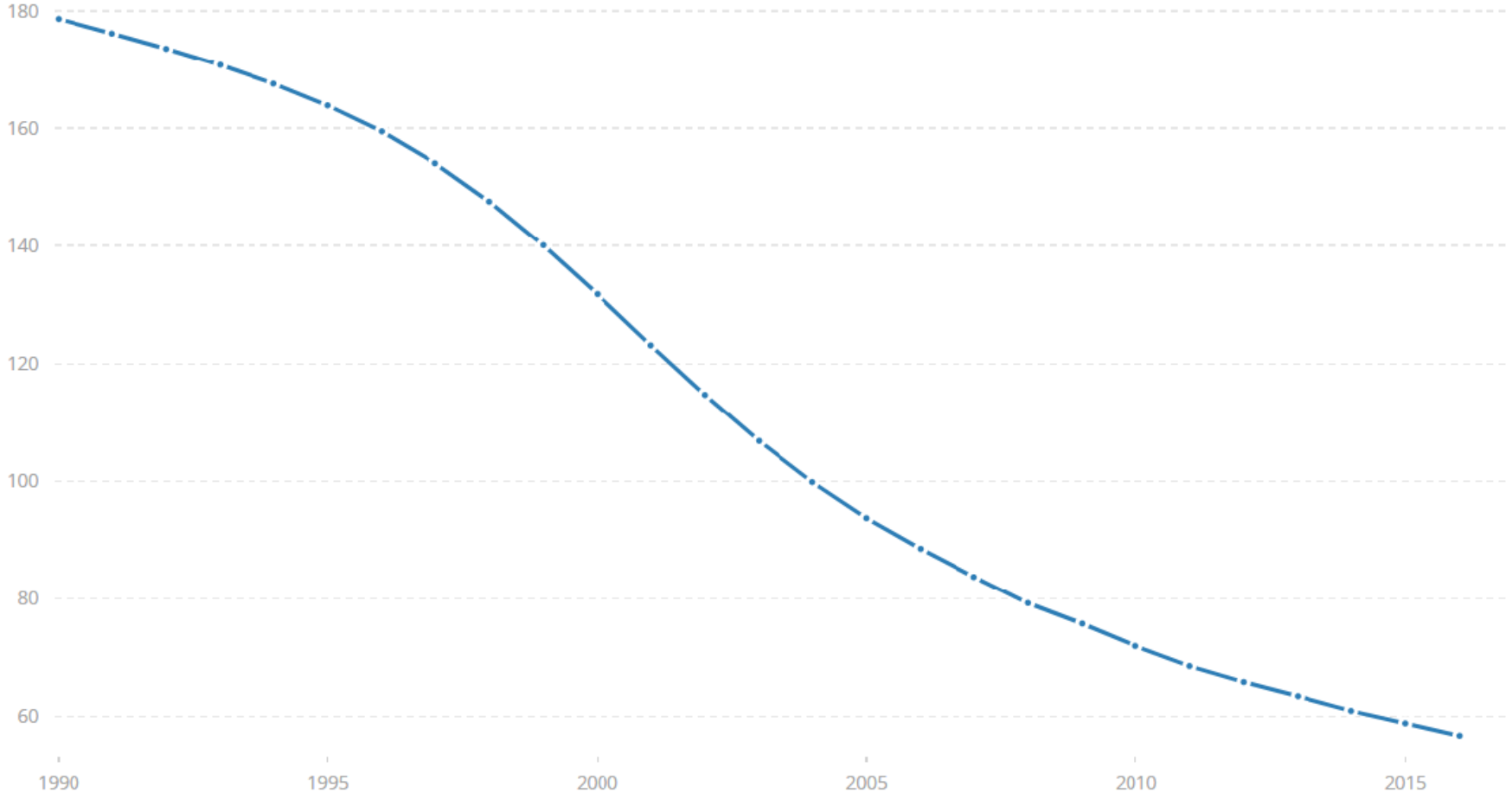
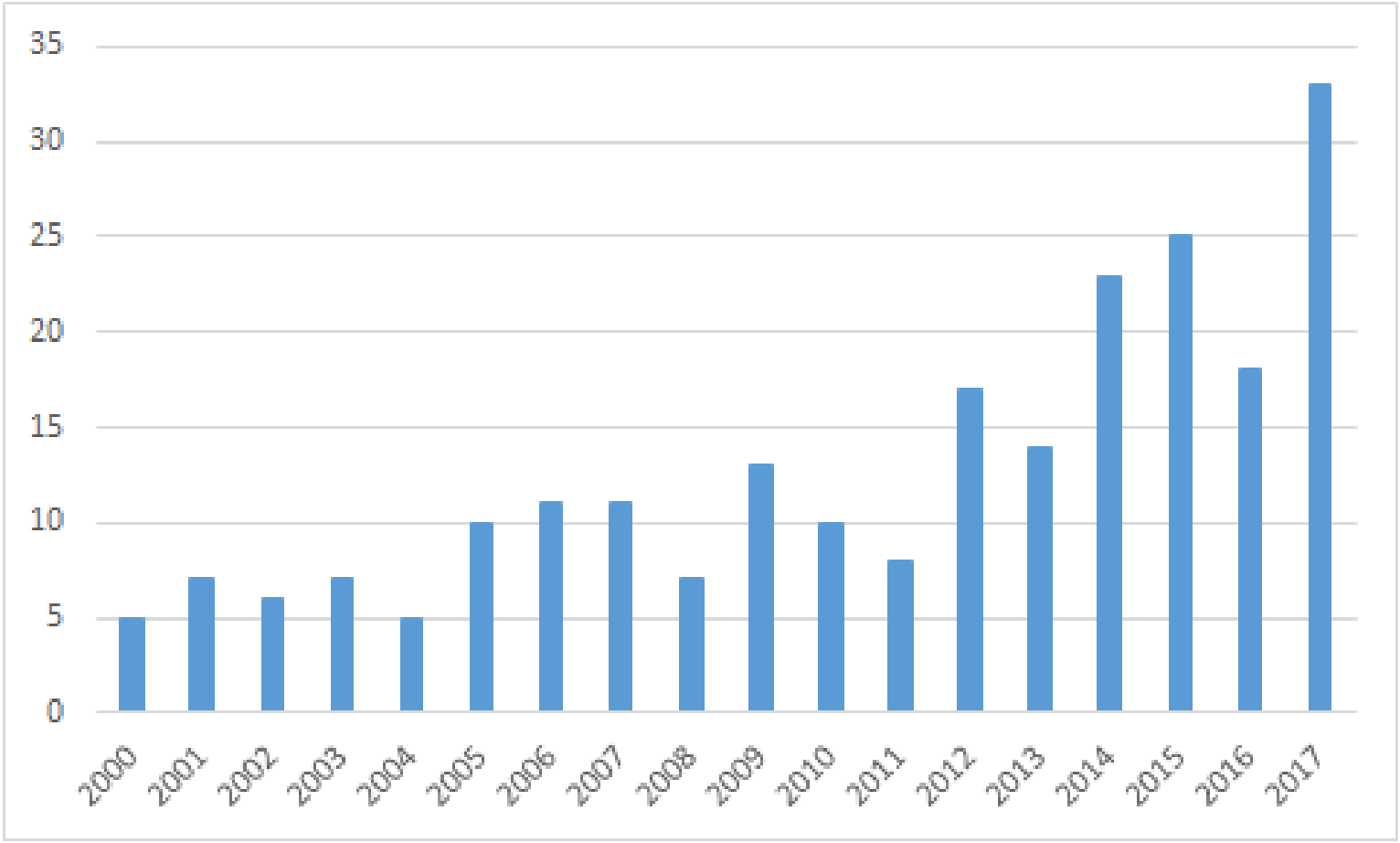
Tanzania Achieves MDG4 Child Mortality by 2/3 from 1990

Tanzania

Under 5 Mortality by 1990-2015



Harvard-Tanzania Collaboration Publications on MCH by Year



Harvard- Tanzania MCH Clinical Trials

Trial of Vitamins 1 (ToV1) 1995-1997

Randomized Trial of Vitamin Supplements in Relation to Vertical Transmission of HIV-1 in Tanzania

*†Wafaie W. Fawzi, ¶Gernard Msamanga, *†David Hunter, #Ernest Urassa, §Boris Renjifo, **Davis Mwakagile, Ellen Hertzmark, *Jenny Coley, *Miriam Garland, ‖Saidi Kapiga, *Gretchen Antelman, §Max Essex, and ‡Donna Spiegelman

*Departments of *Nutrition, †Epidemiology, ‡Biostatistics, §Immunology and Infectious Disease, ‖Population Sciences and International Health, Harvard School of Public Health, Boston, Massachusetts; and Departments of ¶Community Health, #Obstetrics and Gynecology, and **Microbiology and Immunology, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania*

Randomized Trial of 1,078 HIV-infected pregnant women <u>before ART</u>

1) Vitamin A
2) Multivitamin B,C,E
3) Vitamin A + Multivitamin B,C,E
4) Placebo

ToV1 Main Findings

Maternal Vitamin A Supplements Increased Risk of Mother-to-child HIV transmission

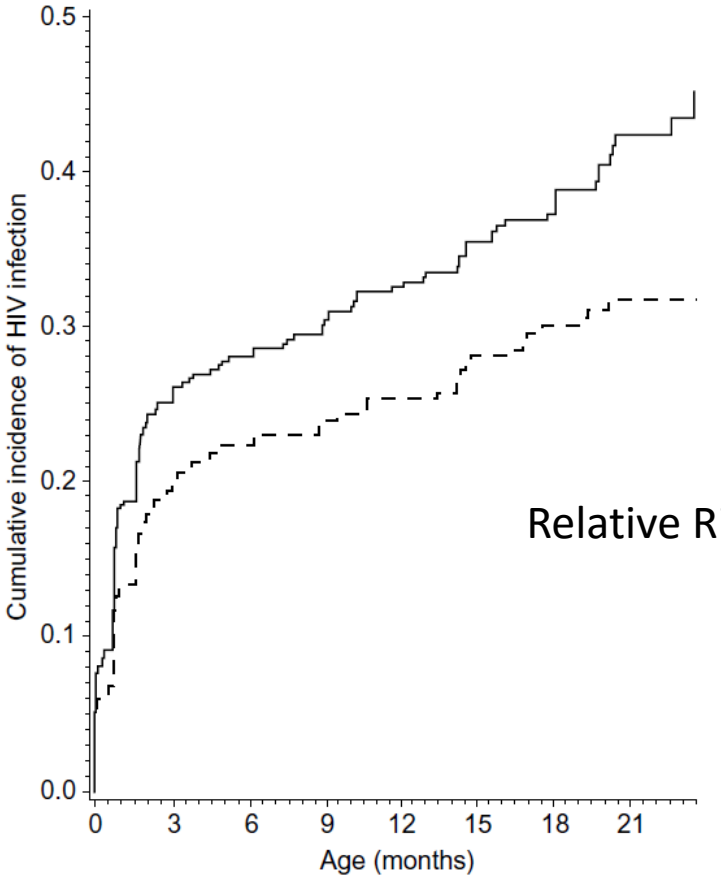


Fig. 1. Incidence of HIV infection in children by vitamin A regimen of mother. Regimen of mother: —— vitamin A; – – – no vitamin A.

Relative Risk: 1.38 (95% CI: 1.09 – 1.76)

ToV1 Main Findings

Multivitamins reduced the risk of fetal loss

Outcome	No. of pregnancies	Multivitamins		RR (95% CI)	*p* Value[b]
		Yes	No		
		N (%)	*N* (%)		
Fetal loss	1045	31 (5.9)	52 (10.0)	0.59 (0.39–0.91)	.02

Trial of Prenatal Supplements (PNS) 2001-2004

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Vitamins and Perinatal Outcomes among HIV-Negative Women in Tanzania

Wafaie W. Fawzi, M.B., B.S., Dr.Ph., Gernard I. Msamanga, M.D., Sc.D., Willy Urassa, M.D., Ph.D., Ellen Hertzmark, M.S., Paul Petraro, M.P.H., Walter C. Willett, M.D., Dr.P.H., and Donna Spiegelman, Sc.D.

Randomized Trial of 8,468 HIV-negative pregnant women

1) Multivitamin B,C,E
2) Placebo

MVits Increased Birthweight and May Reduce Mortality

Table 2. Birth Outcomes.

End Point*	No. of Women	No. of Infants	Multivitamin Group	Placebo Group	Difference or Relative Risk	P Value
Birth weight — g	7732	7866				
Mean (95% CI)			3148 (3132 to 3165)	3083 (3067 to 3099)	67 (43 to 89)	<0.001
<2500 g — no. (%)			306 (7.8)	368 (9.4)	0.82 (0.70 to 0.95)	0.01
<2000 g — no. (%)			85 (2.2)	109 (2.8)	0.75 (0.56 to 1.02)	0.06

Outcome	Time of Death	No. of Women	No. of Infants	Multivitamin Group	Placebo Group	Relative Risk (95% CI)	P Value
				no. (%)			
Stillbirth	Between 28 weeks' gestation and delivery	8277	8434	134 (3.2)	163 (3.9)	0.84 (0.67–1.05)	0.13
Death							
Perinatal	Between 28 weeks' gestation and 1 week after delivery	7919	8048	227 (5.7)	268 (6.6)	0.88 (0.74–1.04)	0.13
Postnatal	During the first 6 weeks after delivery	7638	7751	100 (2.6)	120 (3.1)	0.86 (0.66–1.13)	0.28

Neovita
2010-2013

Effect of neonatal vitamin A supplementation on mortality in infants in Tanzania (Neovita): a randomised, double-blind, placebo-controlled trial

*Honorati Masanja, Emily R Smith, Alfa Muhihi, Christina Briegleb, Salum Mshamu, Julia Ruben, Ramadhani Abdallah Noor, Polyna Khudyakov, Sachiyo Yoshida, Jose Martines, Rajiv Bahl, Wafaie W Fawzi, for the Neovita Tanzania Study Group**

Randomized Trial of 31, 999 newborns (~20,000 Ifakara / 12,000 Dar)

1) Vitamin A
2) Placebo

Primary Results

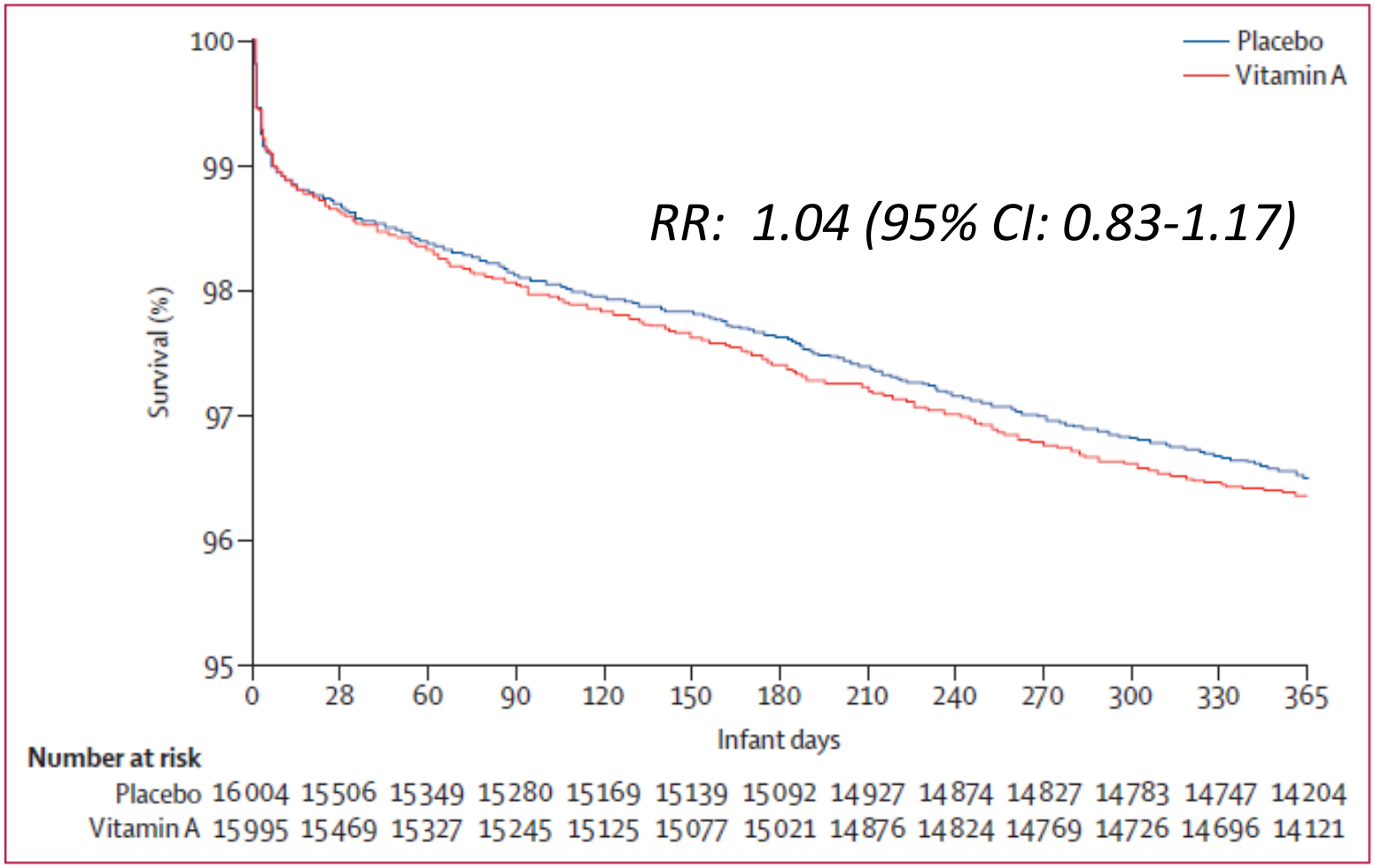


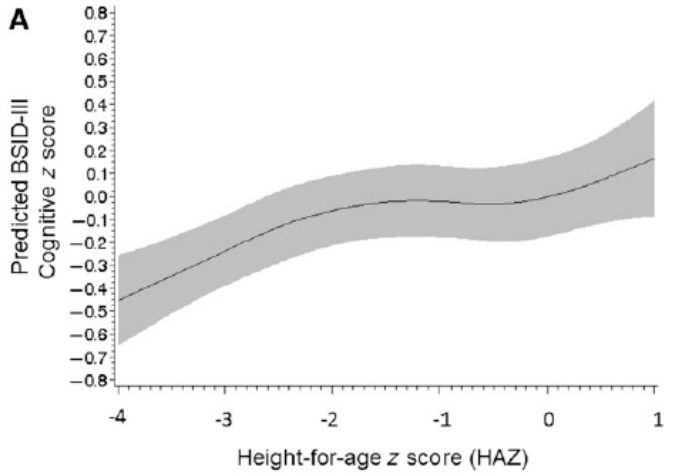
Figure 2: **Kaplan-Meier survival curve up to 12 months**

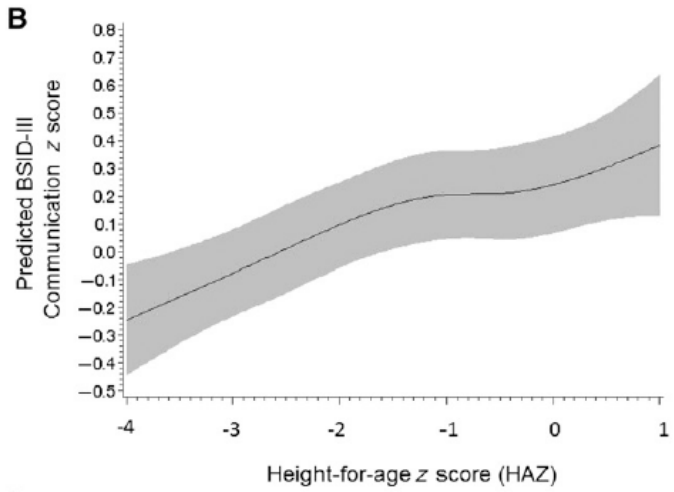
Ongoing MCH Trials

The Journal of Nutrition
Nutritional Epidemiology

Malnutrition and Its Determinants Are Associated with Suboptimal Cognitive, Communication, and Motor Development in Tanzanian Children[1–3]

Christopher R Sudfeld,[4]* Dana Charles McCoy,[8] Günther Fink,[4] Alfa Muhihi,[9] David C Bellinger,[7,10] Honorati Masanja,[9] Emily R Smith,[4] Goodarz Danaei,[4,5] Majid Ezzati,[11] and Wafaie W Fawzi[4–6]





Poor Cognitive Development Associated with:

-Low maternal education

-Poorer households

-Small for gestational age births

-Poor Water / Sanitation

-Low child stimulation

Approaches to deliver integrated solutions for optimal child growth and development in Tanzania 2017-2020

Study Team

Harvard: Chris Sudfeld (PI), Aisha Yousafzai, and Wafaie Fawzi

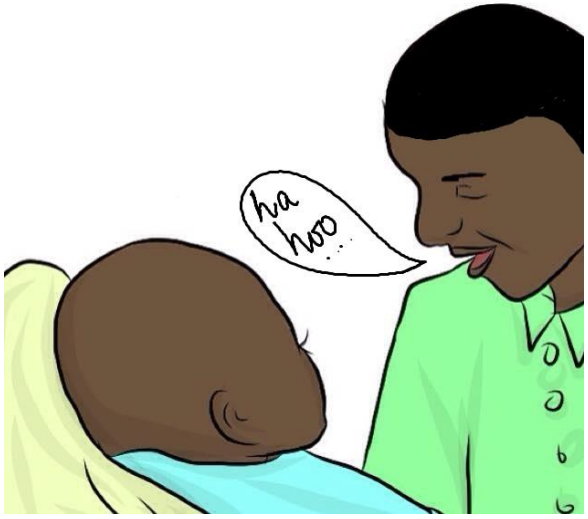
IHI: Honorati Masanja (PI)

Study Population: 600 Mother-Child Pairs

Location: 12 villages in rural Ifakara, Tanzania

Trial Arms: i) Community Health Worker Delivery Child Stimulation Intervention
ii) Conditional Cash Transfer for ANC/child visit + Child Stimulation
iii) Control

Efficacy Outcomes: 1) Child Cognitive, Motor, and Socioemotional Development
2) Child Stunting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Maternal Calcium Supplementation

WHO Recommendation

Calcium supplements	**A.3:** In populations with low dietary calcium intake, daily calcium supplementation (1.5–2.0 g oral elemental calcium) is recommended for pregnant women to reduce the risk of pre-eclampsia.[7]	Context-specific recommendation

Why is Calcium Supplementation not Implemented???

1) High pill burden (3 x 500 mg tablets a day)
2) Weight/Storage (Weighs 1kg per woman)
3) Cost ~$13 USD per woman as compared to Iron-FA <2$

Non-inferiority of Lower Dose Calcium Supplements in Pregnancy for Preeclampsia and Neonatal Outcomes 2017-2021

Study Team

Harvard: Wafaie Fawzi (PI) Chris Sudfeld, Chris Duggan, Blair Wylie

IHI: Honorati Masanja (PI)

AAPH: Mary Sando, Alfa Muhihi

MUHAS: Andreas Pembe

Study Population: 11,000 Pregnant Women in Tanzania / 11,000 in Bangalore, India

Location: ~10 ANC clinics in Dar es Salaam

Trial Arms: i) Daily Calcium supplements containing 1,500 mg
ii) Daily Calcium supplements containing 500 mg

Efficacy Outcomes: 1) Preeclampsia
2) Preterm birth