From MDGs to SDGs: Understanding Progress in Child Undernutrition in Asia

M Niaz Asadullah & **Rajesh Ramachandran**

Monash University Malaysia

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Introduction: Global Goals & Progress in Child Health

- ***MDG era progress***
  - Decline …though < the MDG target
    - child mortality || underweight child population
  - Stunting, an overlooked target (WHO 2015)

- ***SDG era progress*** (The United Nations, 2023)
  - **30** mil fewer stunted children & prevalence rate of **22.3%** in 2022
  - **1** mil fewer children U5 are dying annually
  - Unequal progress during SDG 1st half (Sentongo et al 2021)

Related MDG targets (1990-2015)
- **1.C**. Halve proportion suffering from hunger
- **4.A**. Reduce U5 mortality rate by two-thirds
- **5.A**. Reduce the maternal mortality ratio by three quarters
- **5.B**. Achieve, by 2015, universal reproductive health

Stunting SDG target (2015-2030)
- **2.1.1**: Reduce U5 stunting by 50% (prevalence rate of **13.5% by 2030**)
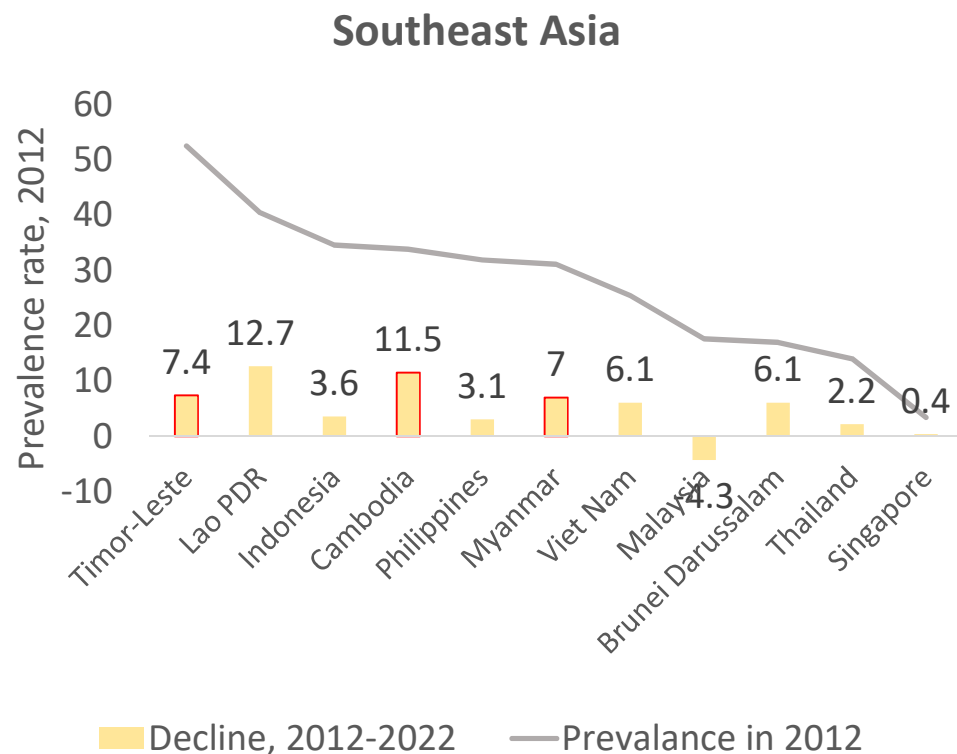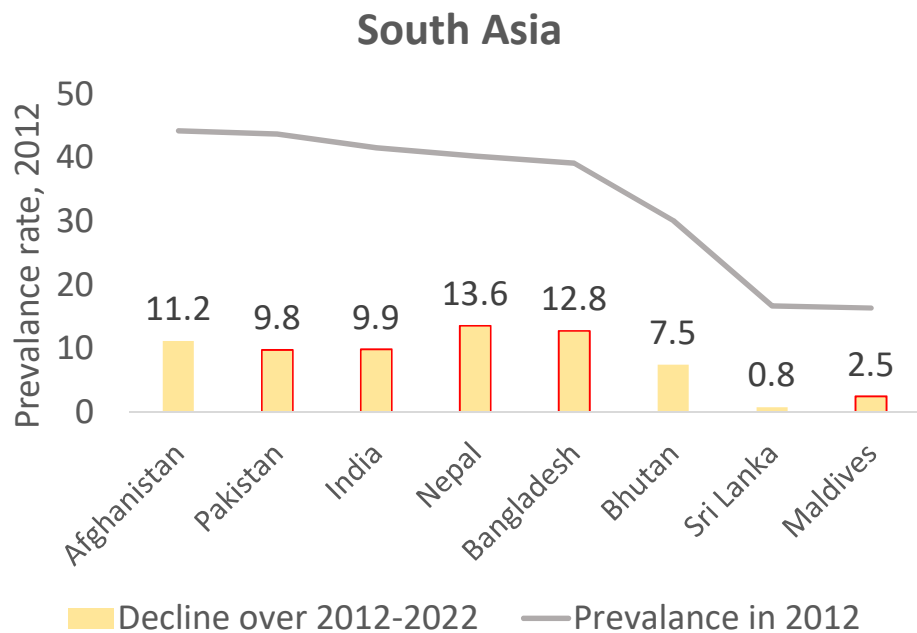
SDG 1st Half: Stunting in South, Southeast & the Rest of Asia

Trends in the percentage of children under 5 affected by stunting, by United Nations region/sub-region, 2012 and 2022
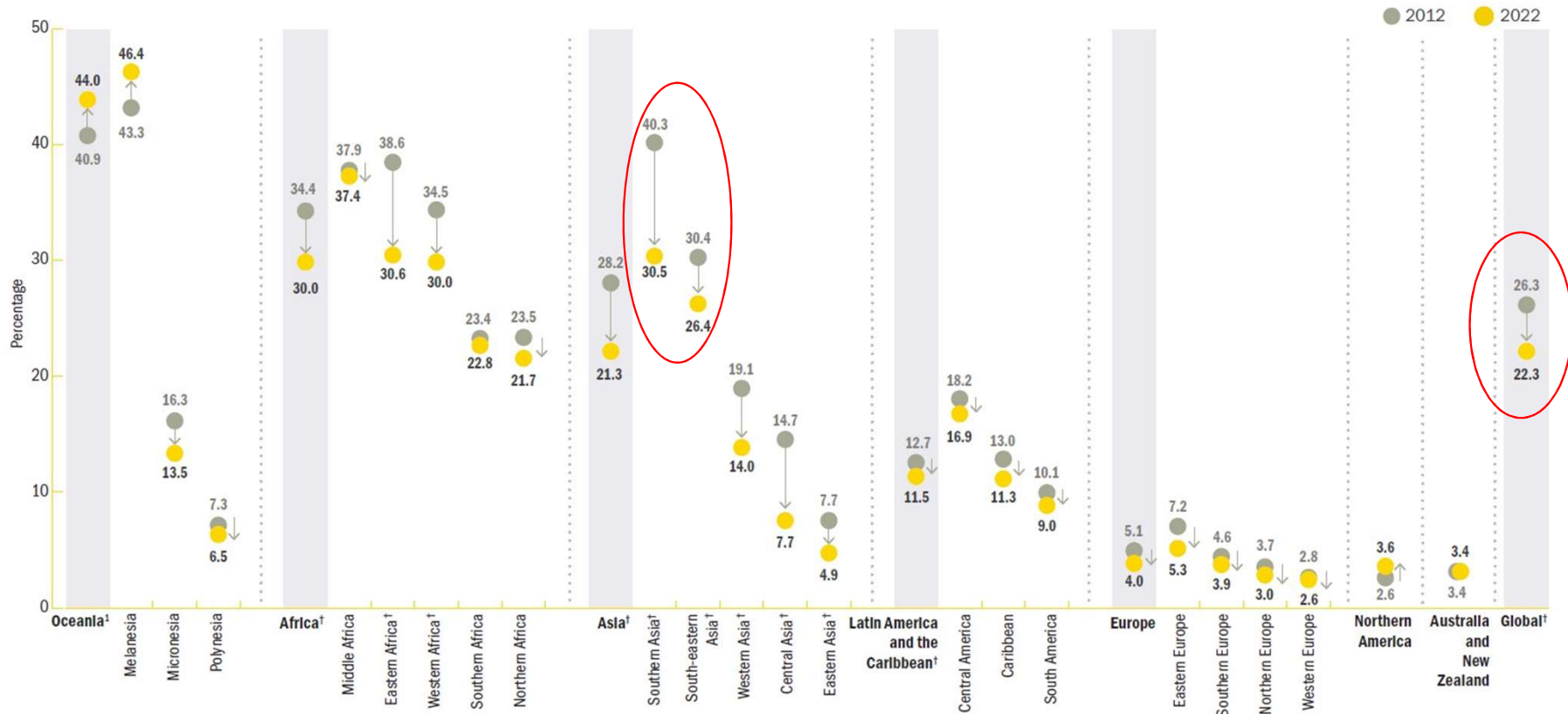
Source: UNICEF, WHO, World Bank Group Joint Malnutrition Estimates, 2023 edition.

SDG 1st Half: Stunting *Within* South & Southeast Asia

South Asia

Prevalence rate, 2012

Country	Decline
Afghanistan	11.2
Pakistan	9.8
India	9.9
Nepal	13.6
Bangladesh	12.8
Bhutan	7.5
Sri Lanka	0.8
Maldives	2.5

Decline over 2012-2022 — Prevalance in 2012

Southeast Asia

Prevalence rate, 2012

Country	Decline
Timor-Leste	7.4
Lao PDR	12.7
Indonesia	3.6
Cambodia	11.5
Philippines	3.1
Myanmar	7
Viet Nam	6.1
Malaysia	-4.3
Brunei Darussalam	6.1
Thailand	2.2
Singapore	0.4

Decline, 2012-2022 — Prevalance in 2012

Source: Authors, based on JME 2023 data. Note: Study countries highlighted in red.

Research Objectives

- Height profiles of SDG era children (Target 2.1.1)

- Quantify the aggregate height "advantage" & its evolution
  - How does it vary (i) across countries and (ii) by "MDG legacy" (proxied by maternal schooling)?

- Study population: 8 Asian countries
  - Bangladesh, Nepal, India, Pakistan & Maldives
  - Myanmar, Cambodia & East Timor
    - High stunting prevalence countries (20% +)

Outline of the Talk

- Conceptual framework
- Data
- Methodology
- Results
- Discussion & policy implications
- Conclusion

Conceptualizing SDG "Advantage" in Stunting Reduction (1)

- Adoption of Target 2.1.1: Reduce stunting in U5 to 13.5% by 2030
  - *Jal Jeevan Mission* 2019-2024 – tap water for all in rural (India)
  - *Swachh Bharat Mission* in 2014-2019 – end open defecation (India)

- MDG legacy in goal settings and policy diffusion (Fukuda-Parr and Hulme 2011; Hulme 2015; Gillespie et al., 2013)
  - Water, sanitation and hygiene (WASH) schemes including CLTS
  - Scaling Up Nutrition (SUN) Movement 2010
  - Female (targeted) secondary education programs
    - CCTs in Bangladesh, Pakistan, India, Philippines, India & Cambodia (Fizsbein and Shady, 2009)

Conceptualizing SDG "Advantage" in Stunting Reduction (2)

- **"MDG Legacy"** - investment in maternal education
- Large literature on nutritional returns to parental education
  - Thomas et al 1999; Currie, 2009; Alderman, & Headey 2017; Le & Nguyen 2020
  - Hahn et al 2018; Wu 2022; Shahjahan et al 2022 || Hasan et al 2020; Akresh et al 2023

- Up to 50% variation in MDG-era HAZ variation attributed to parental schooling & household assets
  - Headey et al 2015, Conway et al 2020 || Headey, Hoddinott & Park 2016, 2017

- Post-MDG priority for South Asia (Smith & Haddad, 2015)
  - Up to 22% of the 1970-2010 estimated reduction specific to women's education
  - Continued improvements in women's education

Data: Study Country DHS Rounds

Region	Country	Pre-MDG rounds	MDG rounds	SDG rounds
South Asia	Bangladesh	1994, 1997, 1999-2000	2001, 2004-5, 2007, 2011, 2014	2017-18
	India	1992-3, 1998-99	2005-6	2015-16, 2019-21
	Maldives		2009	2016-17
	Nepal	1996	2001, 2006, 2011	2016 & 2022
	Pakistan	1990-91	2006-7, 2012-13	2017-18
Southeast Asia	Cambodia		2000, 2005, 2010, 2014	2021-22
	Timor-Leste	2009-10	2009-10	2016
	Myanmar		2015-16	2021

Notes:
(1) Pre-MDG data not available for Maldives, Myanmar & East Timore.
(2) Indonesia & Philippines excluded b/c DHS has no child nutrition outcome data
(3) Data for Sri Lanka prior to 2016 is not publicly available – application for special access in progress.
(4) MICS data is not used due to limited coverage (e.g. no data on India beyond 2000)

Methodology

- Pooled OLS cross-country regression model of health status among U5 (0-59 months)

$$H_{ict} = \beta X_{ict} + \gamma T_{ict} + u_{ict} \qquad (1)$$

  - H_{ict} = HAZ and stunting (HAZ <-2 SD) of i-th child in country c and survey year t
  - X_{ict} = indices of child's **MDG & SDG exposure**, birth order & gender; years of schooling of mother & father; mother's HFA & age; open defecation (% of hhs w/o toilet) at PSU; piped water at home
  - T_{ict} = additional controls : household asset index, child age, rural dummy, admin-1 FEs

- Pathways analysis (in-progress & not reported)
  - in-utero care (vaccination); breastfeeding; institutional delivery
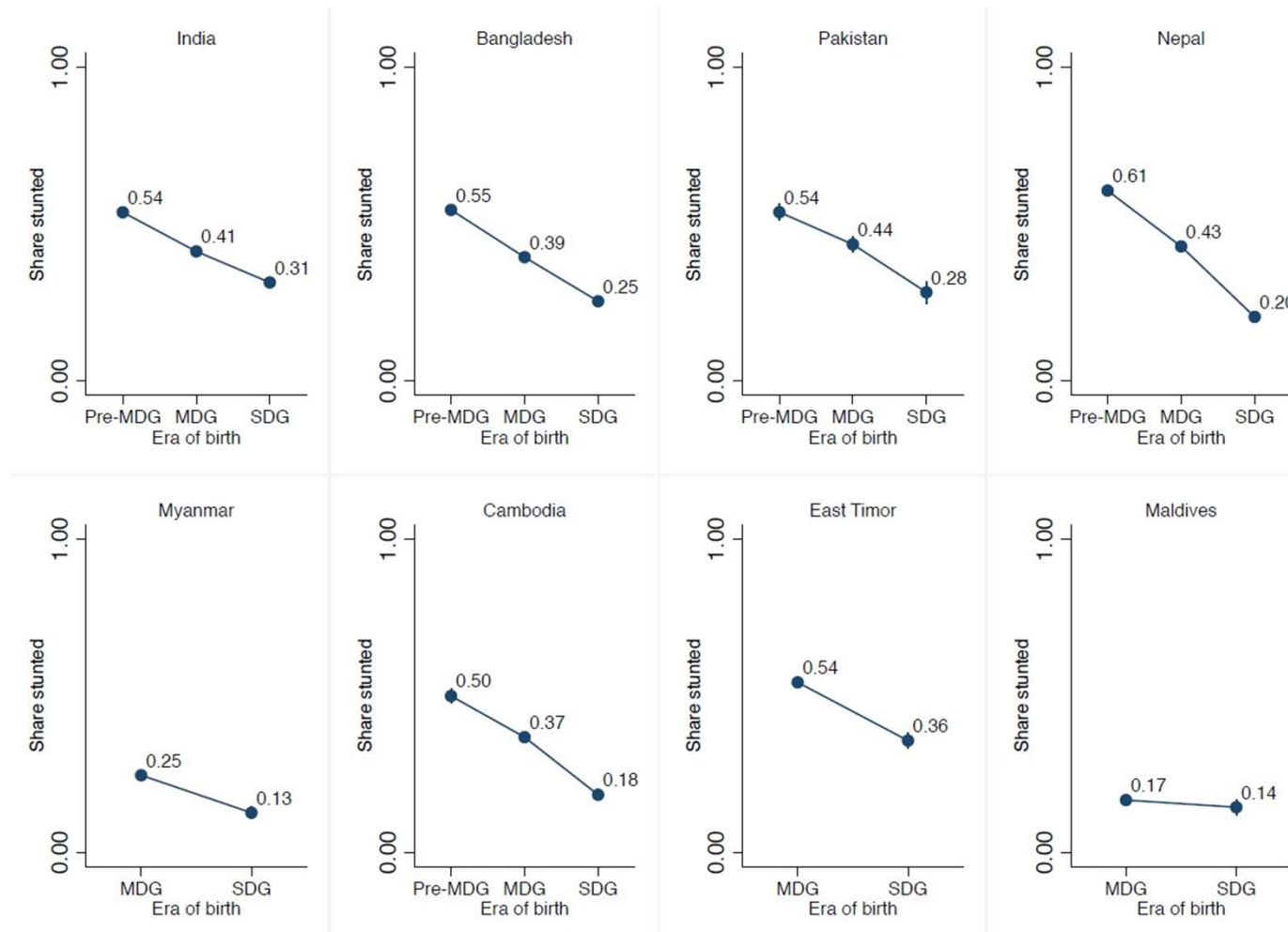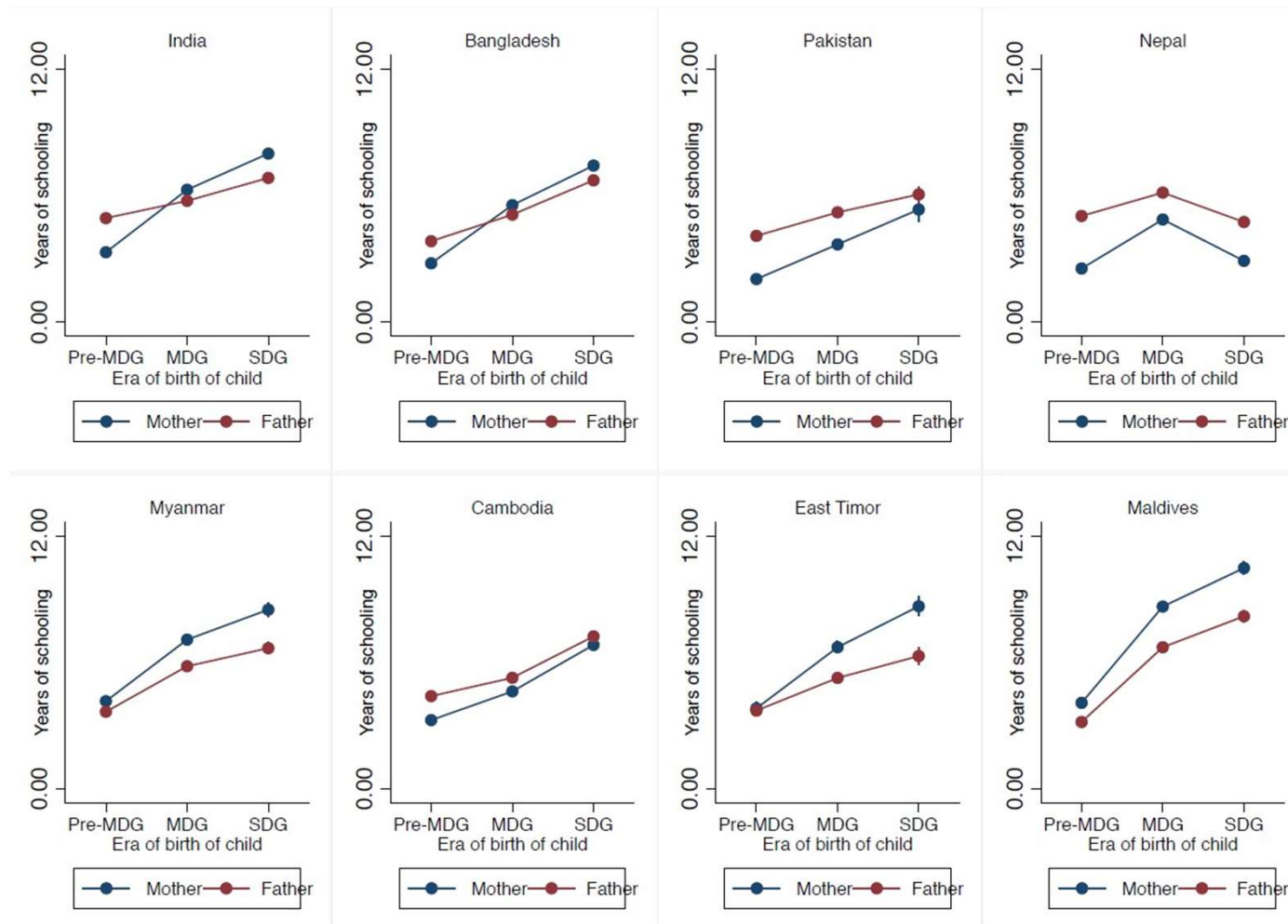
Child's GG Exposure: Survey Years vs Birth Cohort Dummies
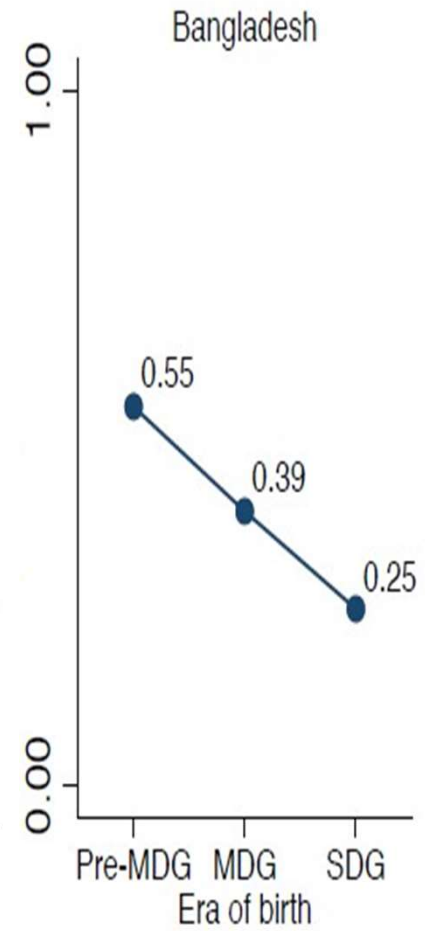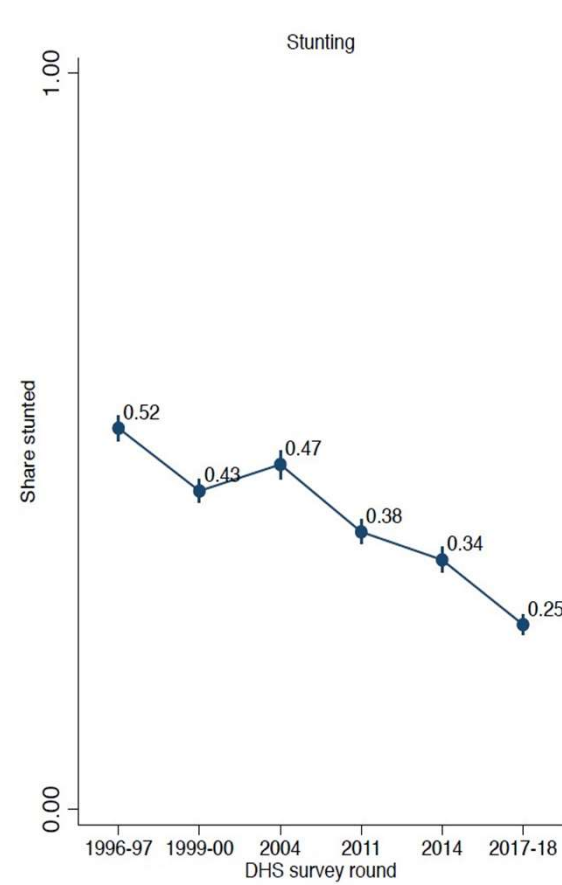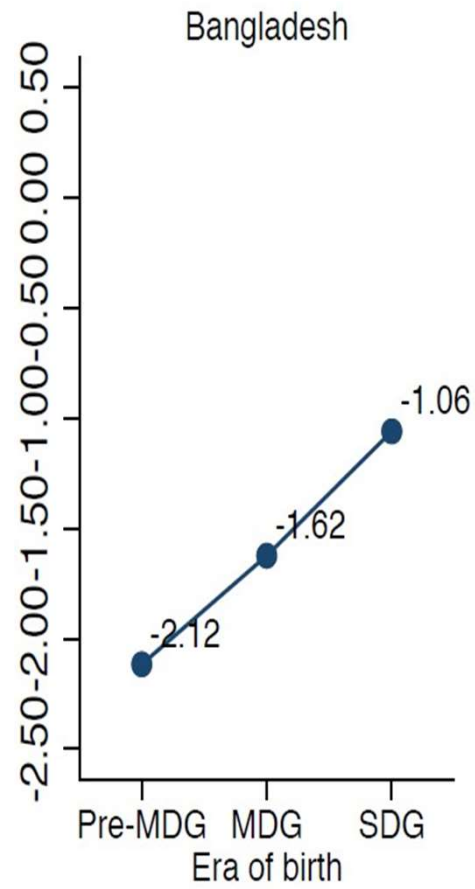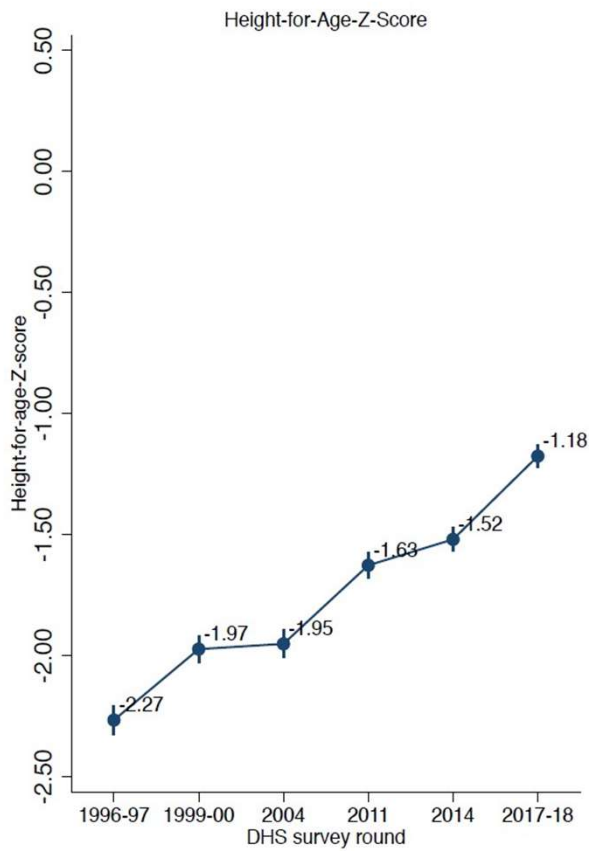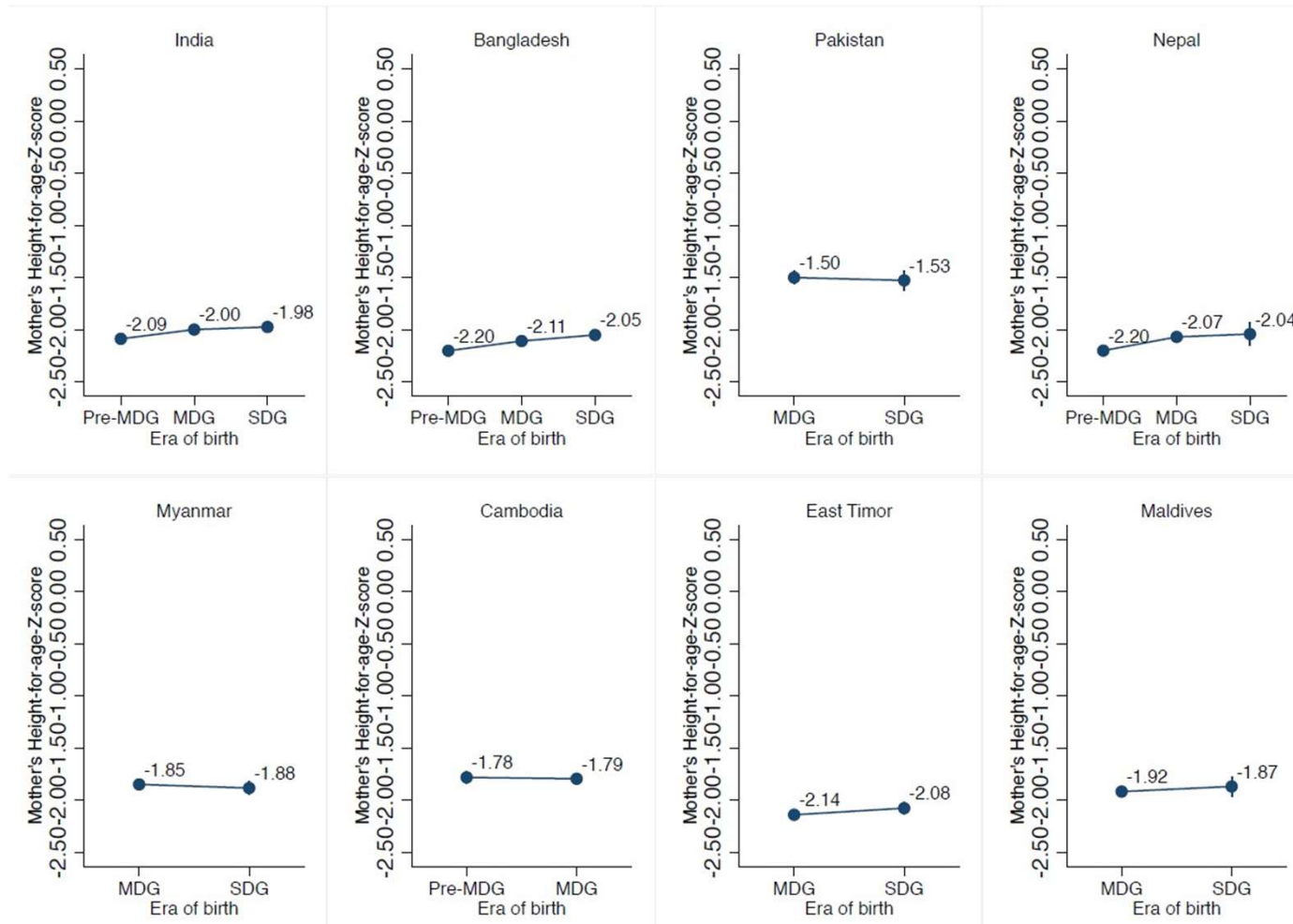
Steady Increase in Child's Height-for-age (HAZ)...
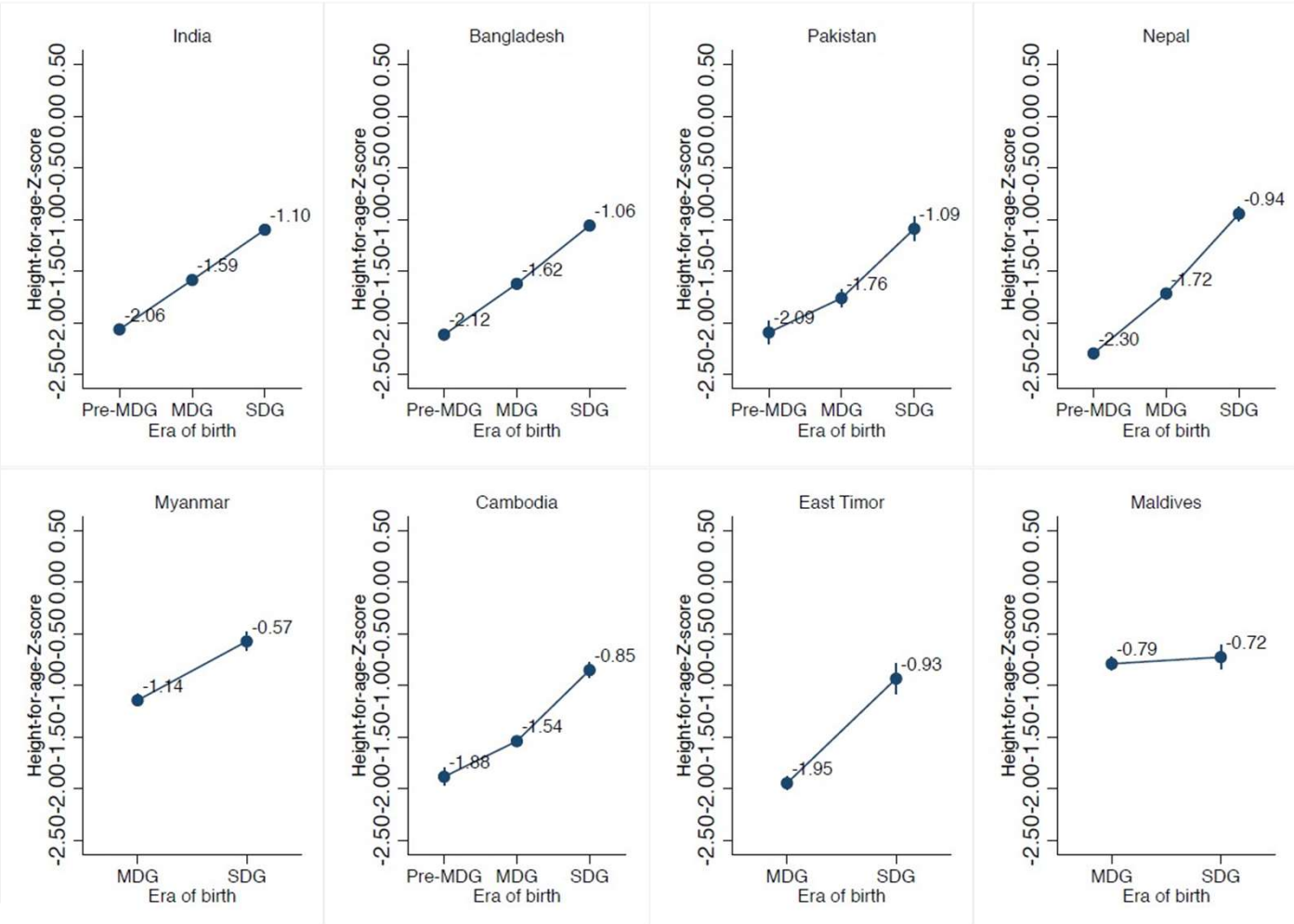
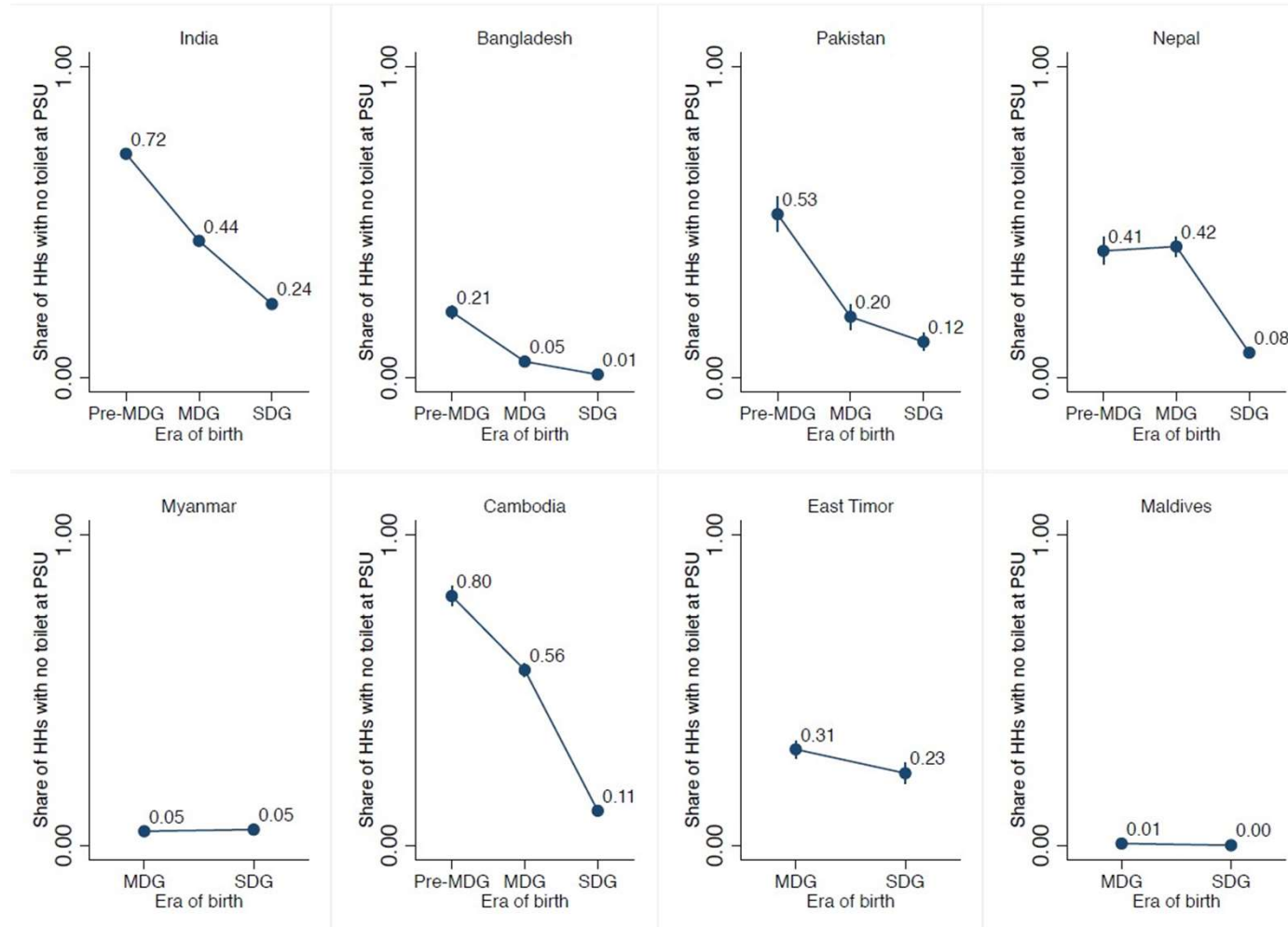# ...and Decline in Stunting Prevalence

Parallel Improvements in Parental Human Capital - Maternal Schooling "Advantage"…
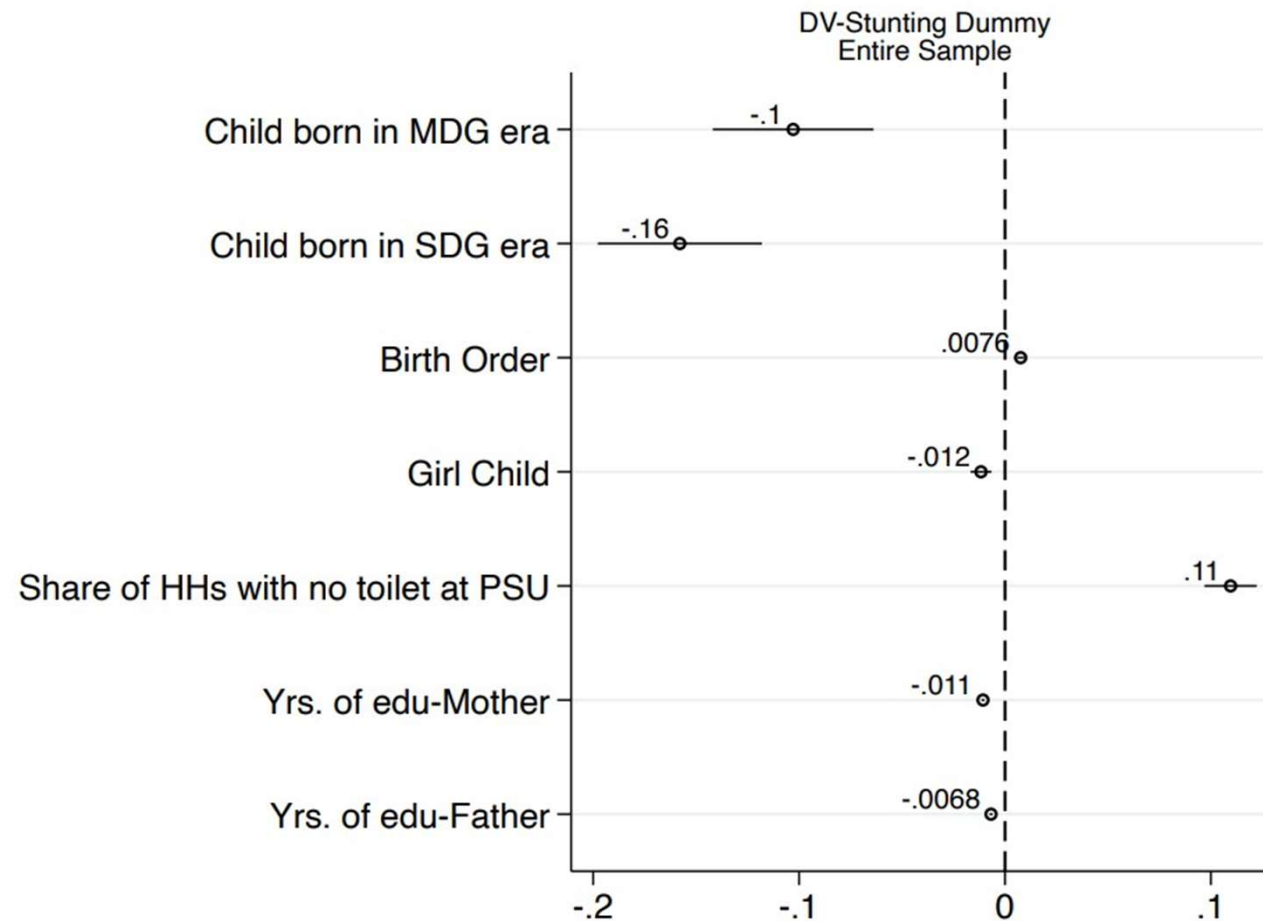
….Though Little Change in Maternal Height
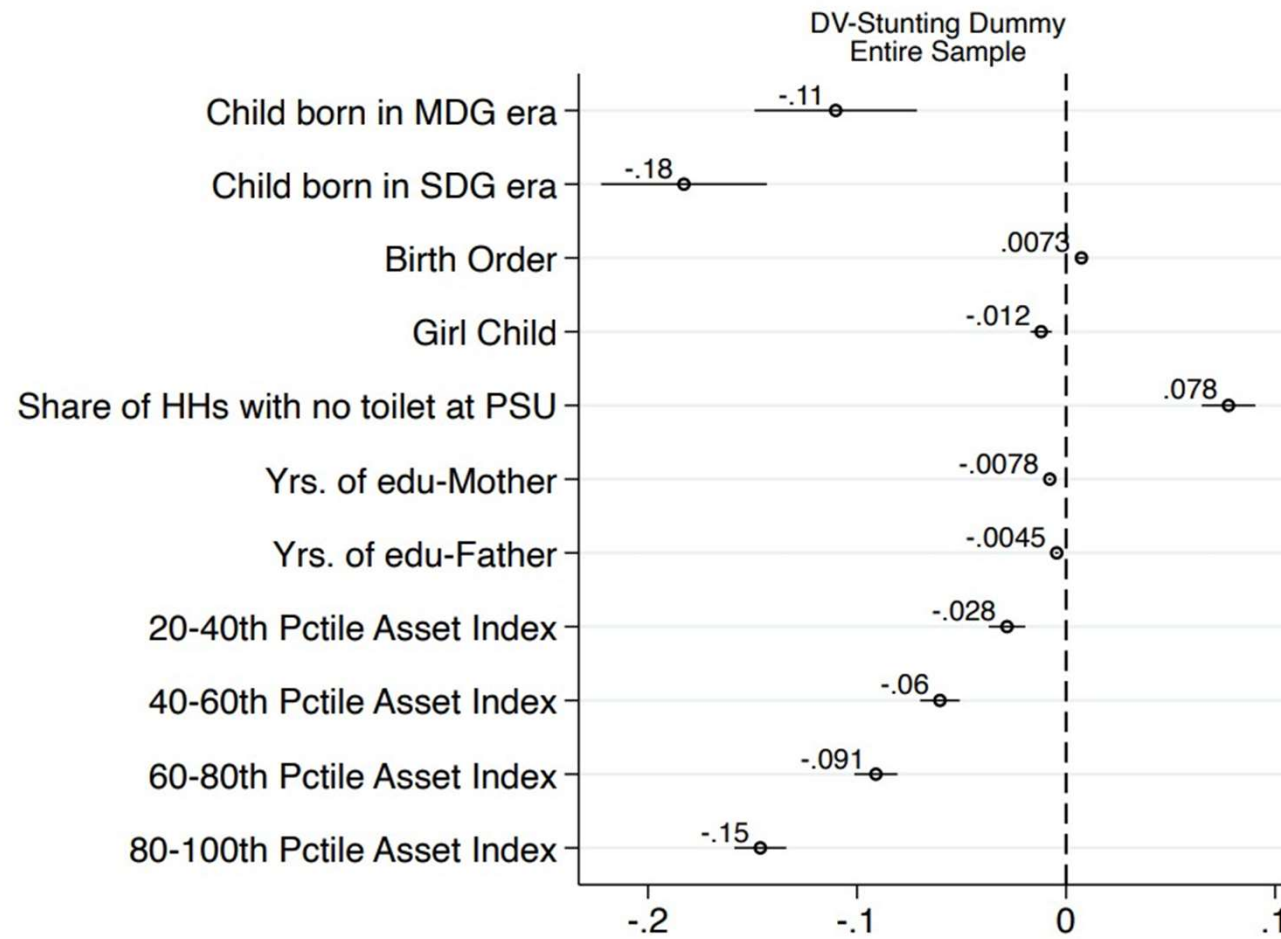
Large Reduction in Open Defecation

Results: Pooled Regression with GG exposure (MDG & SDG dummies)
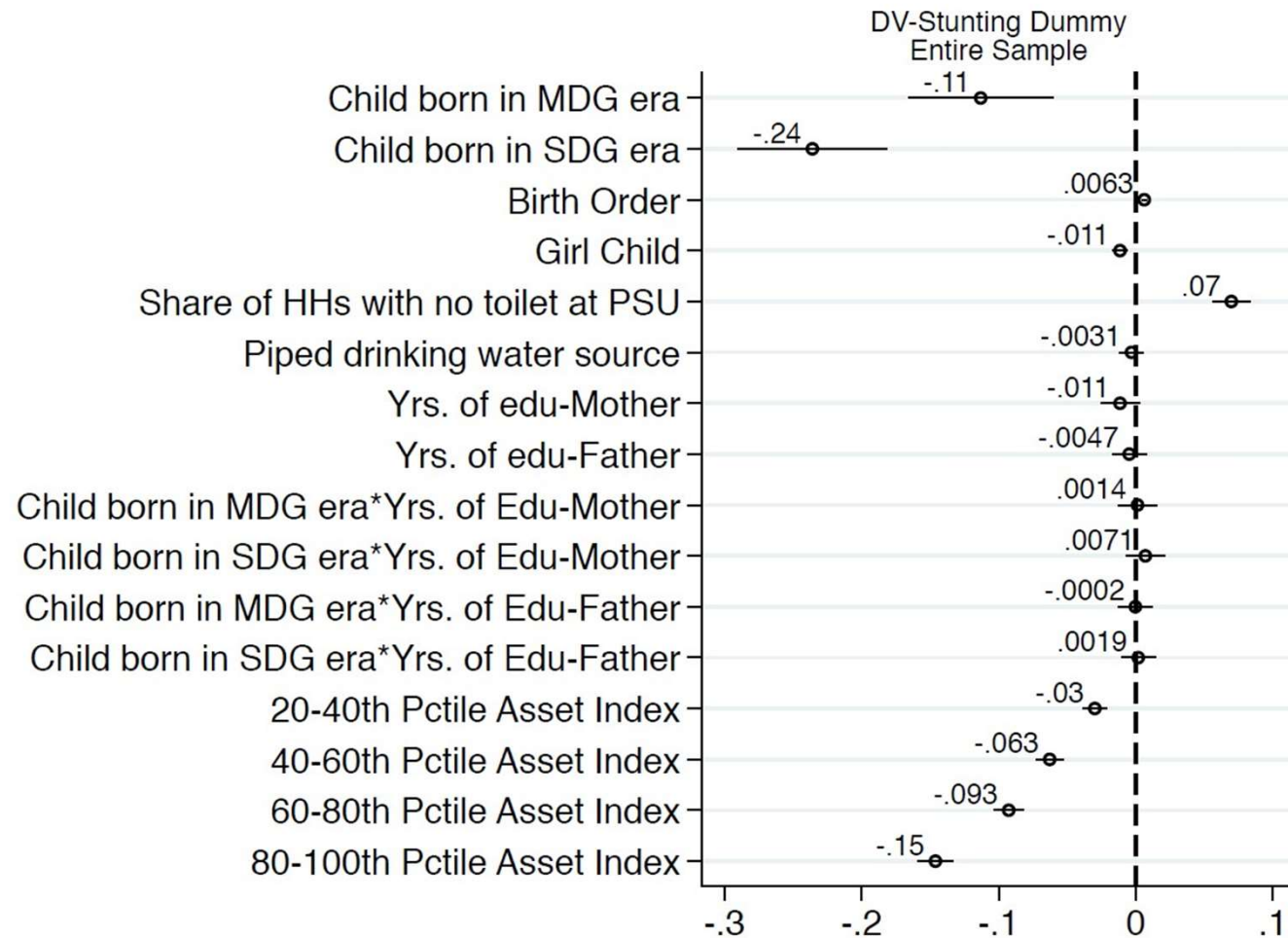
Notes: Only selected correlates are shown.

Regression includes region FEs, pooled over **8** countries & **36** DHS rounds

DV-Stunting Dummy
Entire Sample

- Child born in MDG era: -.1
- Child born in SDG era: -.16
- Birth Order: .0076
- Girl Child: -.012
- Share of HHs with no toilet at PSU: .11
- Yrs. of edu-Mother: -.011
- Yrs. of edu-Father: -.0068

x-axis: -.2, -.1, 0, .1
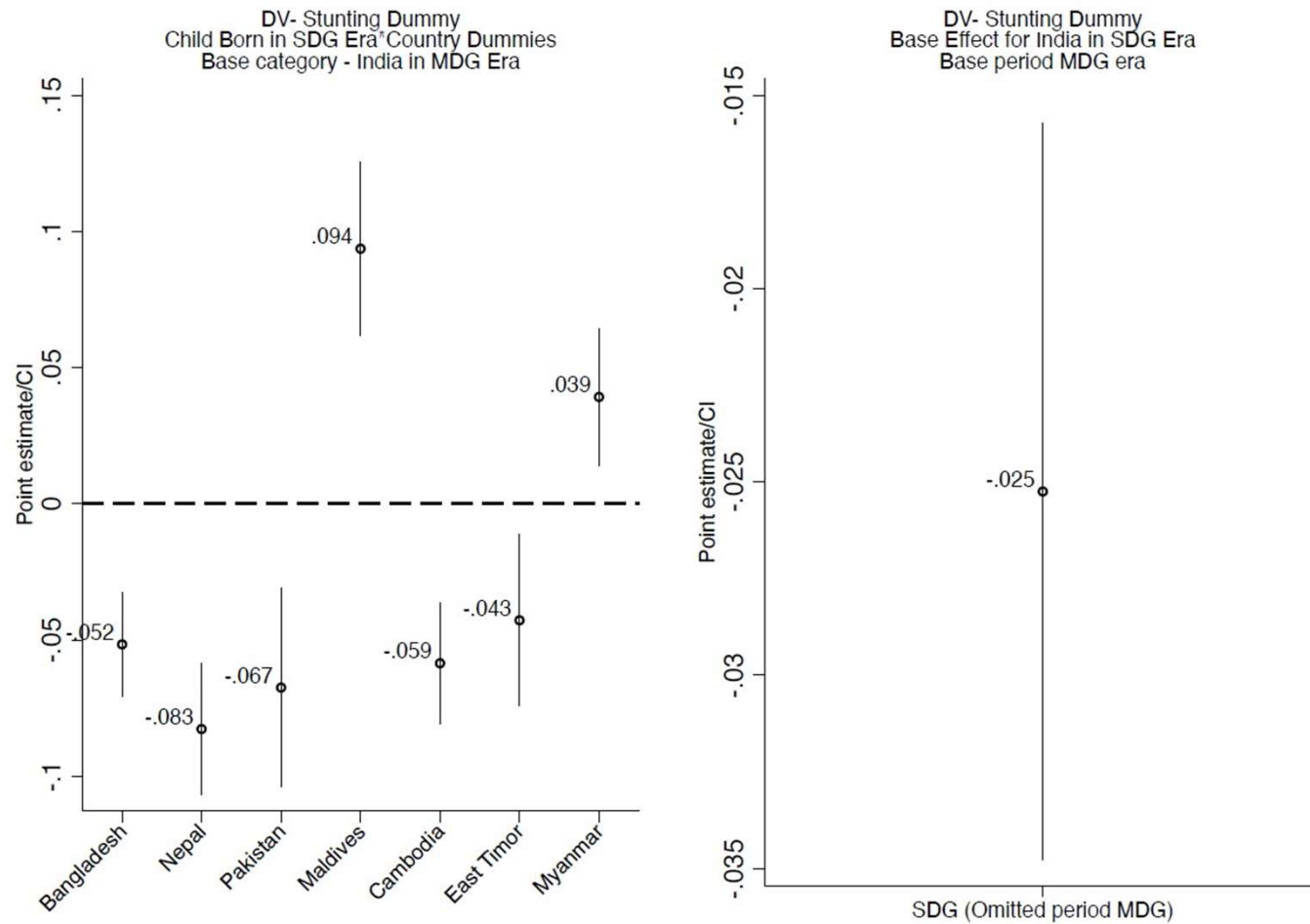
Results: …Adding Household Assets

Notes: Only selected correlates are shown. Regression includes region FEs

Results: …Adding Interactions with Parental Education
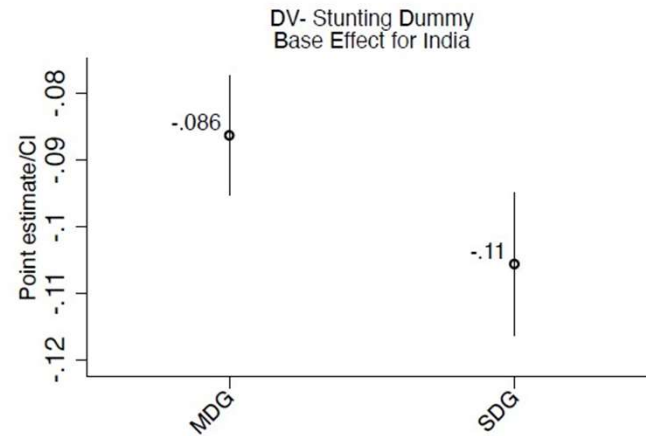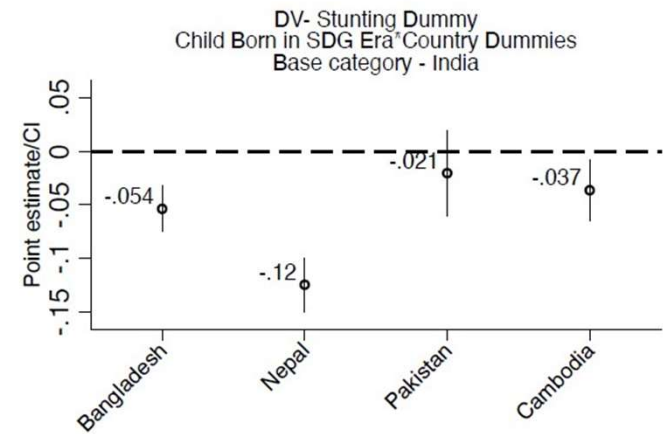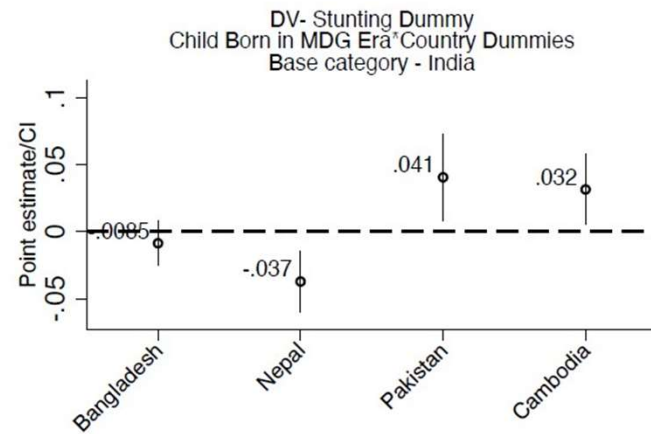

DV-Stunting Dummy
Entire Sample

Notes: Only selected correlates are shown. Regression includes region FEs

Results: Pooled Regression with GG exposure (SDG dummy only) (with country dummies $_{N=8}$)

Notes: Assessment of SDG vs MDG

Results: Pooled Regression with GG exposure (MDG & SDG dummies) (with country dummies $_{N=5}$)

Notes: Assessment of SDG & MDG vs Pre-MDG

Summary & Policy Implications (1)

- SDG era global progress in early childhood undernutrition but inadequate & unequal
  - 76.6 million stunted U5 children in Asia at SDG mid-point
    - 89% in South & Southeast Asia

- Height gains for SDG born cohorts in South/east Asia

- Gains by household wealth status and mother's schooling
  - No mother education premium for MDG & SDG cohorts
  - Supply-side factors: sanitation matters

Summary & Policy Implications (2)

- Differential gains for SDG and MDG cohorts across countries
  - Faster SDG era decline in Bangladesh, Nepal, Pakistan and Cambodia
    - Not just about public expenditure (Sen 2013; Asadullah, Savoia & Sen 2020)
- Indian "Enigma"
  - Health endowment vs private investment (Aiyar & Cummins 2021)
  - Public Infrastructure growth vs decline in toilet usage (Chatterjee et al 2023)
- Accelerating SDG progress: country level factors ?
  - Social innovations || Female agency || State vs NGOs (Asadullah, Savoia & Mahmud 2014; Mahmud et al 2013; Dreze & Sen 2013)
  - Policy diffusion
  - Geographic targeting
  - SDG interlinkages & synergies

Thank you

Email: niaz.asadullah@monash.edu

Twitter: https://twitter.com/Niaz_Asadullah

LinkedIn: https://www.linkedin.com/in/niaz-asadullah-30916b7/

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