Long run effects of early life growth faltering: a retrospective analysis of 847 birth cohorts in low- and middle-income countries

Statistical analysis plan		

Plain English summary of protocol

Background and study aims

Early life growth faltering (slower than expected rate of growth) has increasingly been recognized as a risk factor for children's long run developmental and economic potential. While several studies have linked adult outcomes to child growth at the individual level, there is a lack of evidence on the long run benefits of reducing stunting rates at the national or subnational (population) levels. The aim of this study is to estimate the associations between early life growth faltering at the subnational (population) level and adult height and education outcomes in a representative sample of low- and middle-income countries.

Who can participate?

Adults born between 1985 and 1995 across 34 Demographic and Health Surveys (DHS) conducted between 2006 and 2014 in 24 low- and middle-income countries

What does the study involve?

Data from the DHS surveys is used to calculated average height-for-age for children under age 5 at the country-region and birth cohort level (a group of people born during a particular period or year). The measures of early life growth are then compared with adult height and educational attainment.

What are the possible benefits and risks of participating? This study only uses de-identified data from the DHS Program and there is no further data collection.

Where is the study run from? ICF International (USA)

When is the study starting and how long is it expected to run for? April 2017 to September 2017

Who is funding the study? Boston University (USA)

Who is the main contact? Prof. Mahesh Karra

Contact information

Type(s)

Scientific

Contact name

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Contact details

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Additional identifiers

Protocol serial number

IRB16-0515

Study information

Scientific Title

Long run effects of early life growth faltering: a retrospective analysis of 847 birth cohorts in low- and middle-income countries

Study objectives

To estimate the associations between exposure to early life growth faltering at the subnational (population) level and adult height and education outcomes in a representative sample of lowand middle-income countries.

Ethics approval required

Old ethics approval format

Ethics approval(s)

This study obtained a human subjects exemption from the institutional review board at Harvard University, 05/04/2016, protocol number IRB16-0515. Only de-identified data were obtained from the Demographic and Health (DHS) survey program at https://dhsprogram.com/

Study design

Observational cross-sectional cohort study

Primary study design

Observational

Study type(s)

Other

Health condition(s) or problem(s) studied

Early life growth faltering (height and stunting at childhood)

Interventions

All available anthropometric data collected through the Demographic and Health Surveys (DHS) is combined to construct country-region measures of early childhood exposure to growth faltering, and this dataset is used to quantify the long-term outcomes of cohort-level changes in early life environments. The final analytic sample consists of 211,318 adult records across 34 DHS surveys that were conducted between 2006 and 2014 in 24 low- and middle-income countries.

Data from the Demographic and Health Surveys were used to compute average height-for-age z-scores for children under age 5 at the country-region and birth cohort level. The cohort measures of early life growth were then linked to adult height and educational attainment. The primary exposure of interest was population-level early life growth faltering, with adult height and adult educational attainment as primary outcomes. Multivariable linear regression models were used to estimate the associations between adult outcomes and population-level measures of early life linear growth.

Intervention Type

Other

Primary outcome(s)

- 1. Adult height, measured by reported height in adulthood, taken from DHS surveys conducted between 2006 and 2014
- 2. Educational attainment, measured by the highest educational grade completed, taken from DHS surveys conducted between 2006 and 2014

Key secondary outcome(s))

No secondary outcome measures

Completion date

28/09/2017

Eligibility

Key inclusion criteria

211,318 adults who born between 1985 and 1995 across 34 DHS surveys that were conducted between 2006 and 2014 in 24 low- and middle-income countries

Participant type(s)

Mixed

Healthy volunteers allowed

No
Age group Adult
Lower age limit 18 years
Sex All
Key exclusion criteria Missing income data
Date of first enrolment 01/01/1985
Date of final enrolment 31/12/1995
Locations
Countries of recruitment Burkina Faso
Cameroon
Colombia
C^1 III :
Côte d'Ivoire
Dominican Republic
Dominican Republic
Dominican Republic Egypt
Dominican Republic Egypt Ghana
Dominican Republic Egypt Ghana Haiti
Dominican Republic Egypt Ghana Haiti Jordan
Dominican Republic Egypt Ghana Haiti Jordan Kenya

Nepal

Pakistan
Peru
Rwanda
Senegal
Tanzania
Uganda
United States of America
Zambia

Niger

Nigeria

Study participating centre ICF International 530 Gaither Road, Suite 500 Rockville United States of America 20850

Sponsor information

Organisation

Zimbabwe

Boston University

ROR

https://ror.org/05qwgg493

Funder(s)

Funder type

University/education

Funder Name

Boston University

Alternative Name(s)

Newbury Biblical Institute, Methodist General Biblical Institute, Boston Theological Seminary, Boston Theological Institute, Universitas Bostoniensis, BU

Funding Body Type

Private sector organisation

Funding Body Subtype

Universities (academic only)

Location

United States of America

Results and Publications

Individual participant data (IPD) sharing plan

The trialists only used de-identified data from the DHS Program and were in no way involved with any of the data collection or human subjects processes. Further information about participation in a DHS survey can be found here: https://dhsprogram.com/What-We-Do/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm. The DHS data are publicly available at https://dhsprogram.com/ - the data can be accessed free of charge upon request from ICF International, the organization that manages the DHS data.

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	04/07/2019	08/07/2019	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes