



HARVARD

SCHOOL OF PUBLIC HEALTH

Department of Global Health
and Population



ECONOMIC IMPACT OF SUB OPTIMAL NUTRITION AND CHILD DEVELOPMENT

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*Foundations for the Future: Approaches to Advancing
Global Nutrition and Early Childhood Development*

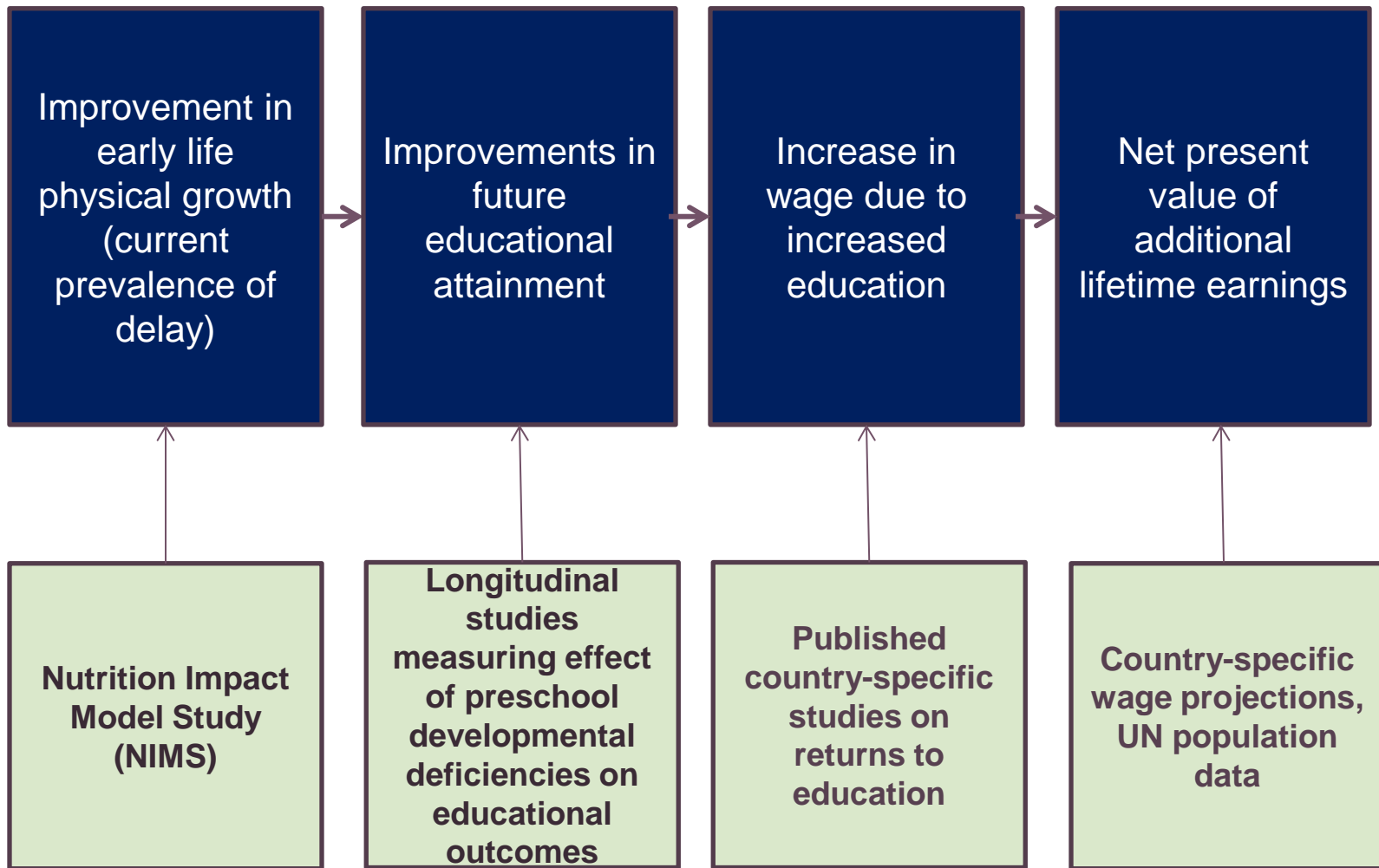
December 1st 2016

Background

- A growing literature has highlighted the important consequences of early life developmental deficits
 - Particularly strong empirical associations have been observed between early life growth and educational attainment
 - Some data on economic implications available, but mostly local and study-specific
- ➔ The main objective of this project was to create country-specific as well as global estimates of the economic impact of early life growth faltering



Model Stage



Principal Data Sources



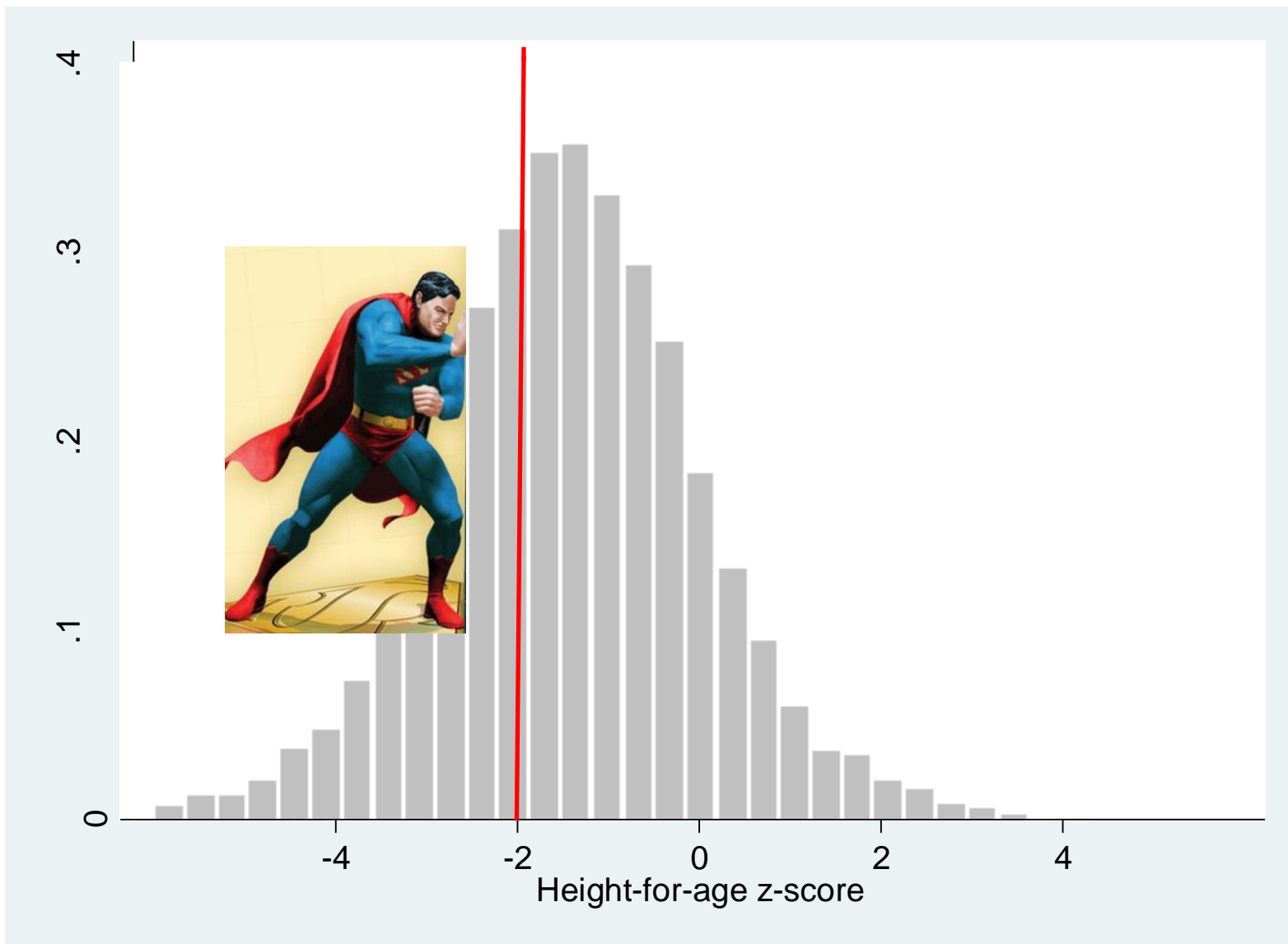
Before



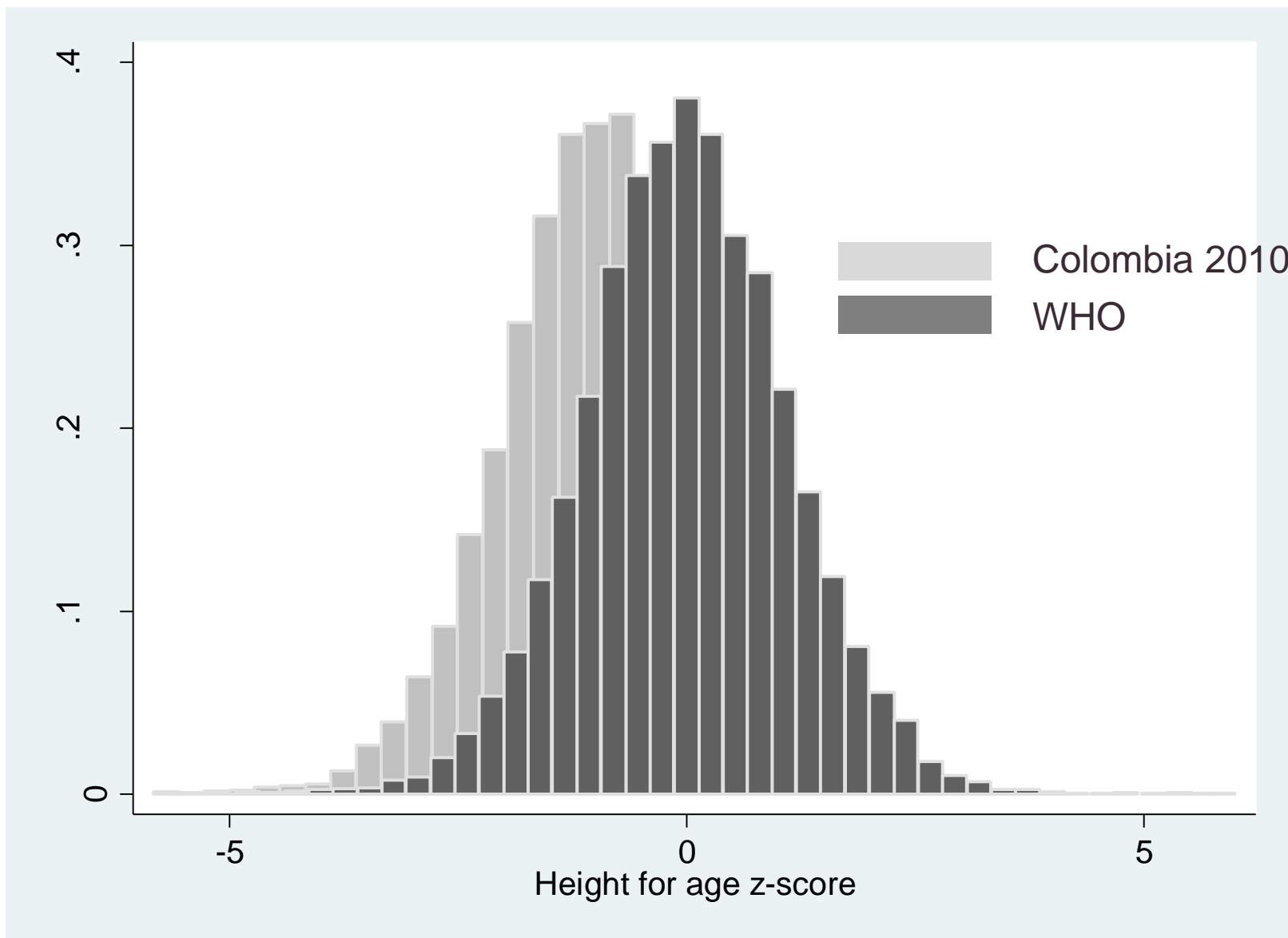
STEP I: How Would Children's Height Change if Everybody would Reach Their Physical Growth Potential?



Height Distribution: WHO Reference & Tanzania



Current vs. Healthy Height Distribution: Colombia



Quantifying Benefits

- **Years of educational attainment:** universally beneficial, but maybe harder to understand at a global level (what do a million school years mean?)
- **Dollars of future income lost:** likely the most common measure, but dependent on local wage and price levels, and thus not “neutral” across countries

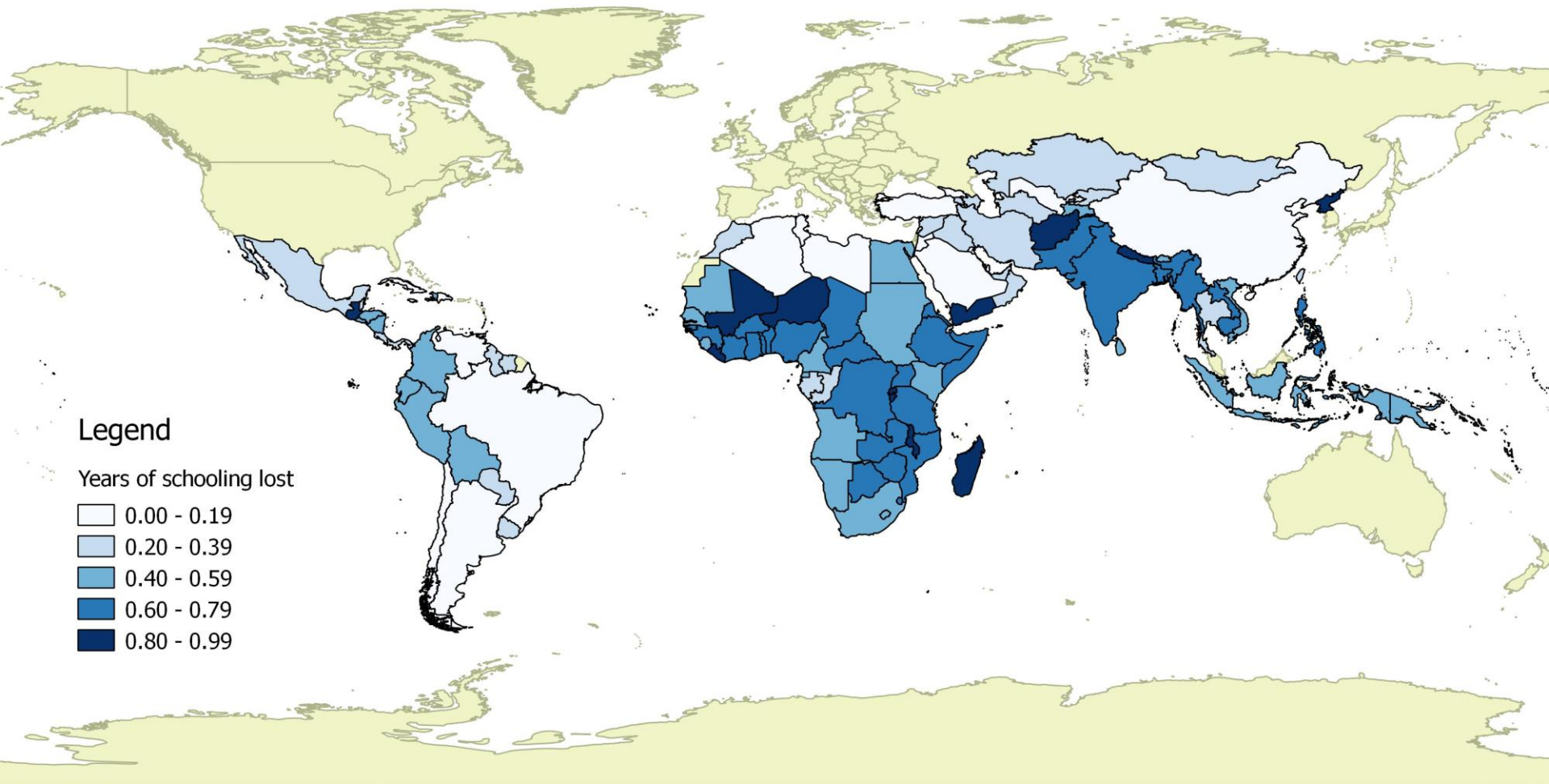


Years of Educational Attainment Lost

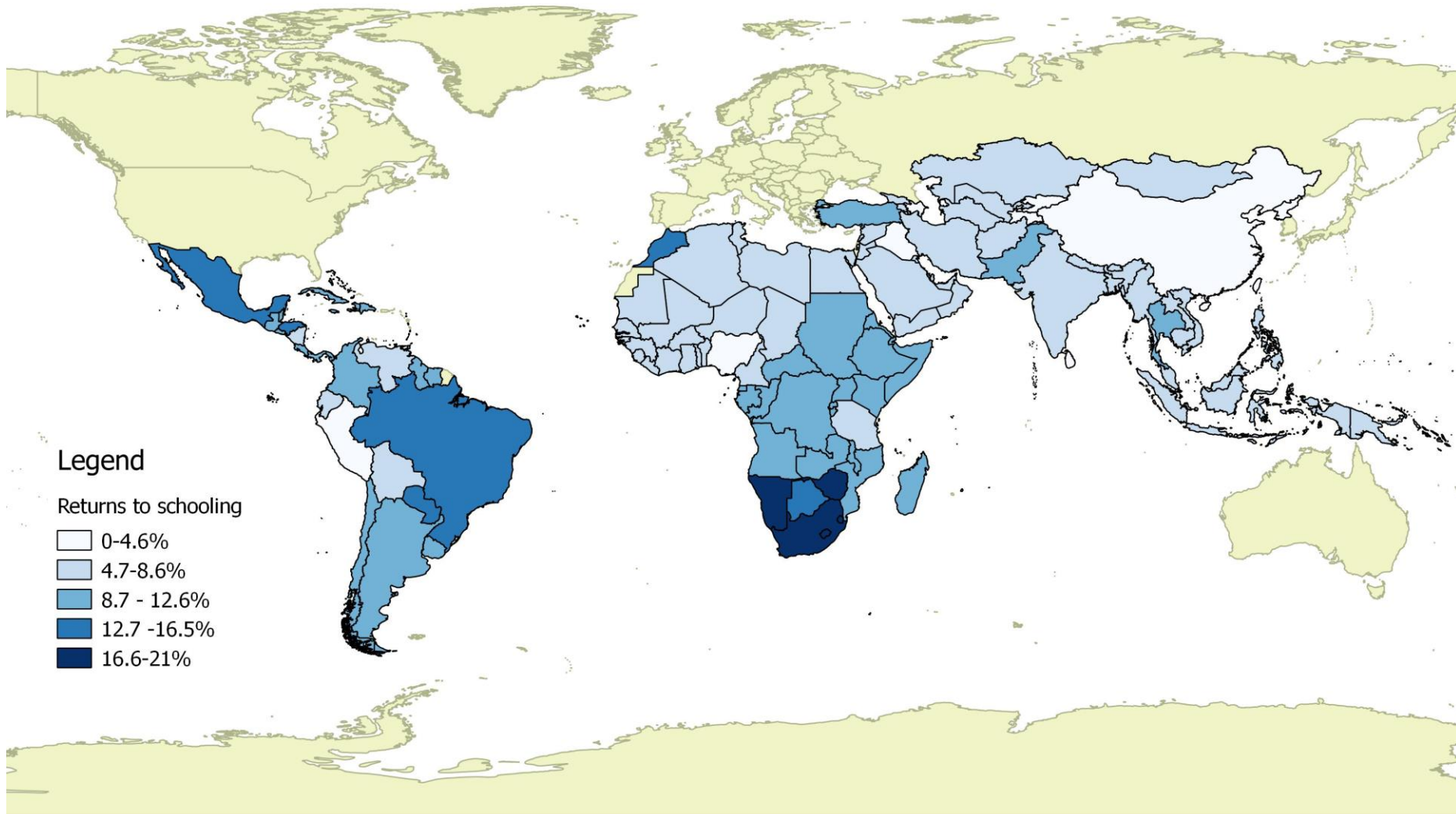
	Countries	Cohort size (Million)	Total years of educational attainment lost (millions)	95% CI
East Asia/Pacific	25	29.5	10.9	[6.6, 15.6]
Latin America & Caribbean	32	11.0	3.4	[2.0, 5.0]
North Africa & Middle East	28	12.3	4.4	[2.3, 6.7]
South Asia	6	36.7	27.6	[20.0, 35.8]
Sub-Saharan Africa	46	33.5	23.1	[17.2, 29.5]



Years of Educational Attainment Lost



Returns to Schooling



Main Modeling Assumptions

- 40 years of labor force participation (20-59)
- 3% annual discounting
- 2% annual real wage growth
- Average local wage earned over lifetime
- Benefits in international dollars (or PPP)



Economic Impact

	Nominal US\$ billion	PPP-adjusted US\$ billion
East Asia and Pacific	32.9 [17.1, 50.7]	114.8 [59.4, 176.6]
Latin America and Caribbean	44.8 [19.2, 74.6]	106.9 [45.9, 178.2]
North Africa, Middle East and Central Asia	18.3 [6.8, 31]	65.8 [24.7, 111.7]
South Asia	46.6 [33.4, 61.1]	222.2 [159.1, 291.2]
Sub-Saharan Africa	34.2 [24.4, 45.3]	106.8 [76.2, 141.2]
Global benefits per cohort in US\$ billion	176.8 [100.9, 262.6]	616.53 [365.3, 898.9]



Limitations

- Only captures early childhood improvements in physical growth (which are smaller than improvements in ECD overall)
 - Only captures labor market benefits through schooling (not accounting for height or cognitive improvements)
 - Does not take into account other health and wellbeing benefits for individuals
- ➔ Likely to be a very conservative estimate of the true benefits



Global Estimates Summary

Globally, under a very conservative set of assumptions, growth faltering causes

- a loss of 69 million years of educational attainment per birth cohort
- a total wage loss of US\$ 177 billion at current exchange rates, and a wage loss of USI\$ 617 at purchasing power parity adjusted rates per birth cohort

Given current cost estimates for prevention, the **benefit cost ratio for investing this area likely exceed a factor of 3:1**



Thank you!

