

sparkling population health solutions

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A New Data Driven Approach to Analyzing the Impact of Social Policies on Health on a Global Scale

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McGill

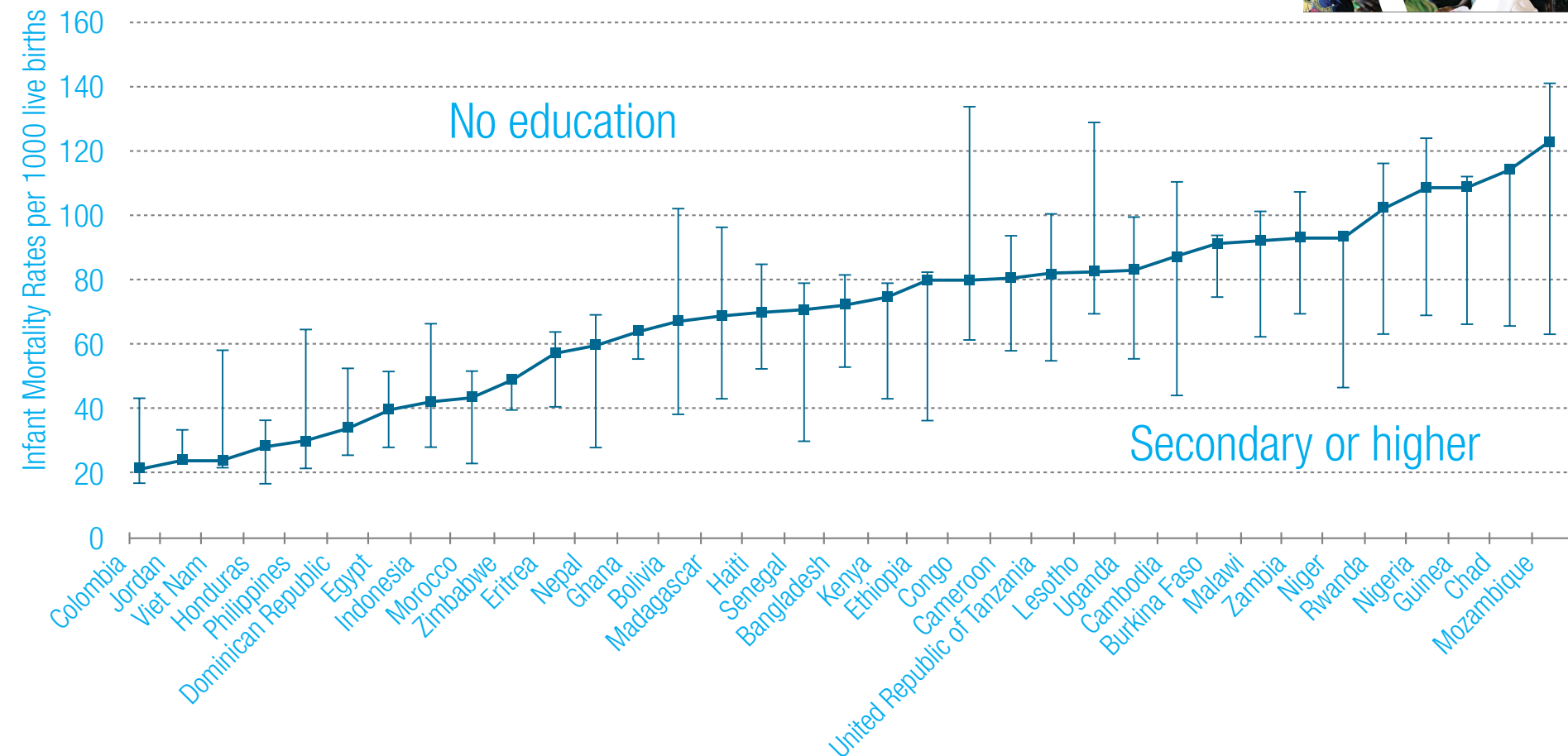
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The **UN Development Goals** represent global commitments to achieve significant and defined progress in global health.

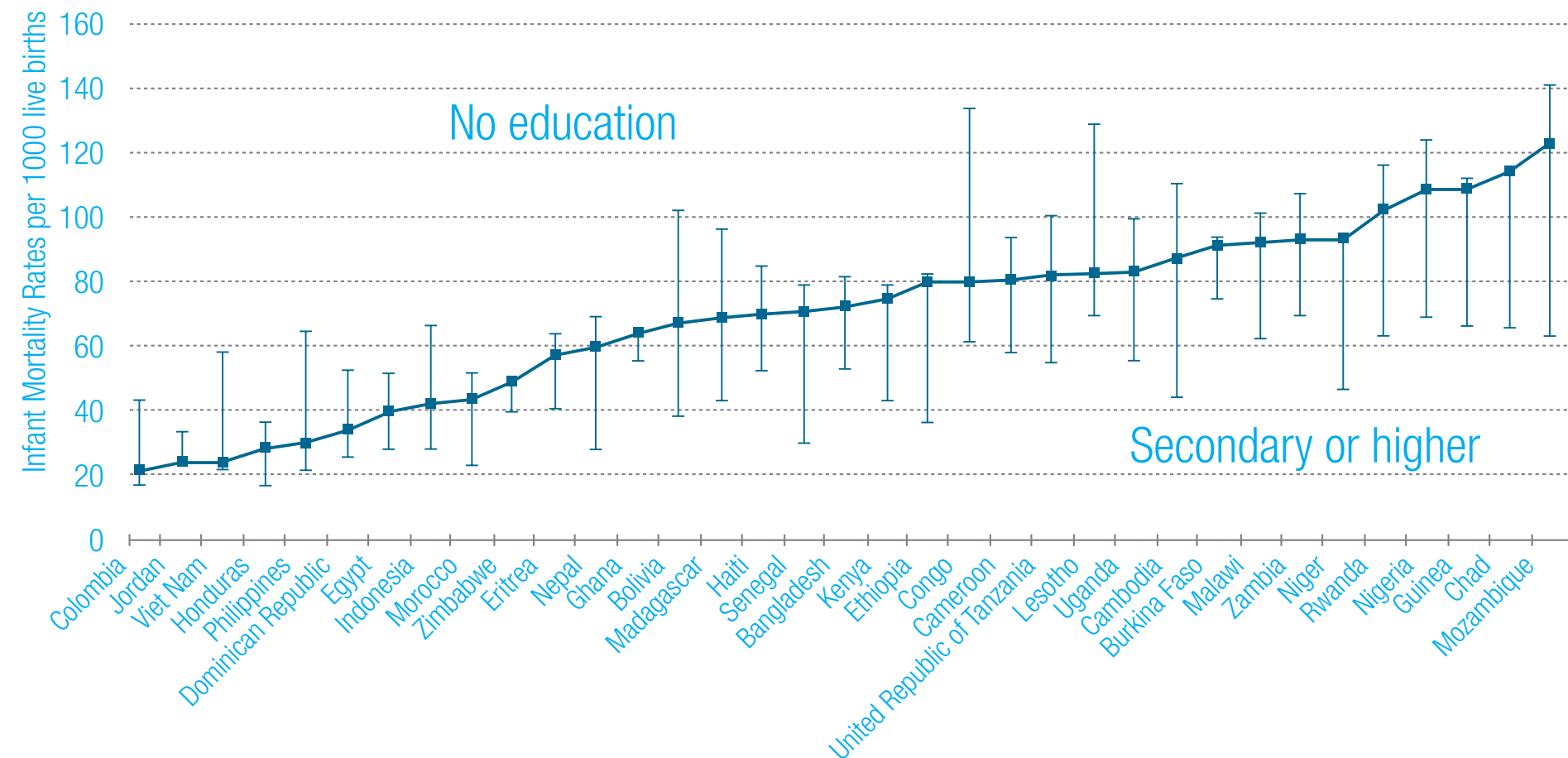
MDG (1990-2015)	SDG (2015-2030)
MDG4. Reduce child mortality—Reduce under-five mortality by two-thirds	SDG 3.2. Lower neonatal mortality to less than 12/1000 births and under-five deaths to less than 25/1000 live births
MDG5. Improve maternal health—Reduce the maternal mortality ratio by three-quarters	SDG 3.1. Reduce global maternal mortality ratio to less than 70/100,000 live births
MDG6. Combat HIV/AIDS, malaria & other diseases—have halted and begin to reverse the spread	SDG 3.3. End epidemics of AIDS, TB, malaria and other communicable diseases

A role for social determinants?



A thought experiment.

Let's assume that the education-based gradients in infant mortality reflect a causal effect and you were charged with eliminating these inequalities...what would you do?



A thought experiment.

How should we intervene to reduce **educational-based inequalities** in **infant mortality**?

- A. Increase secondary or higher education by making it free
- B. Increase secondary education by making it compulsory
- C. Increase secondary education by increasing school quality
- D. Build more secondary schools

A thought experiment.

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- A. Increase secondary or higher education by making it free
- B. Increase secondary education by making it compulsory
- C. Increase secondary education by increasing school quality
- D. Build more secondary schools
- E. Increase access to maternal care among less-educated women
- F. Increase immunization among kids of less-educated mothers
- G. Increase access to family planning
- H. Increase access to household resources among less-educated mothers

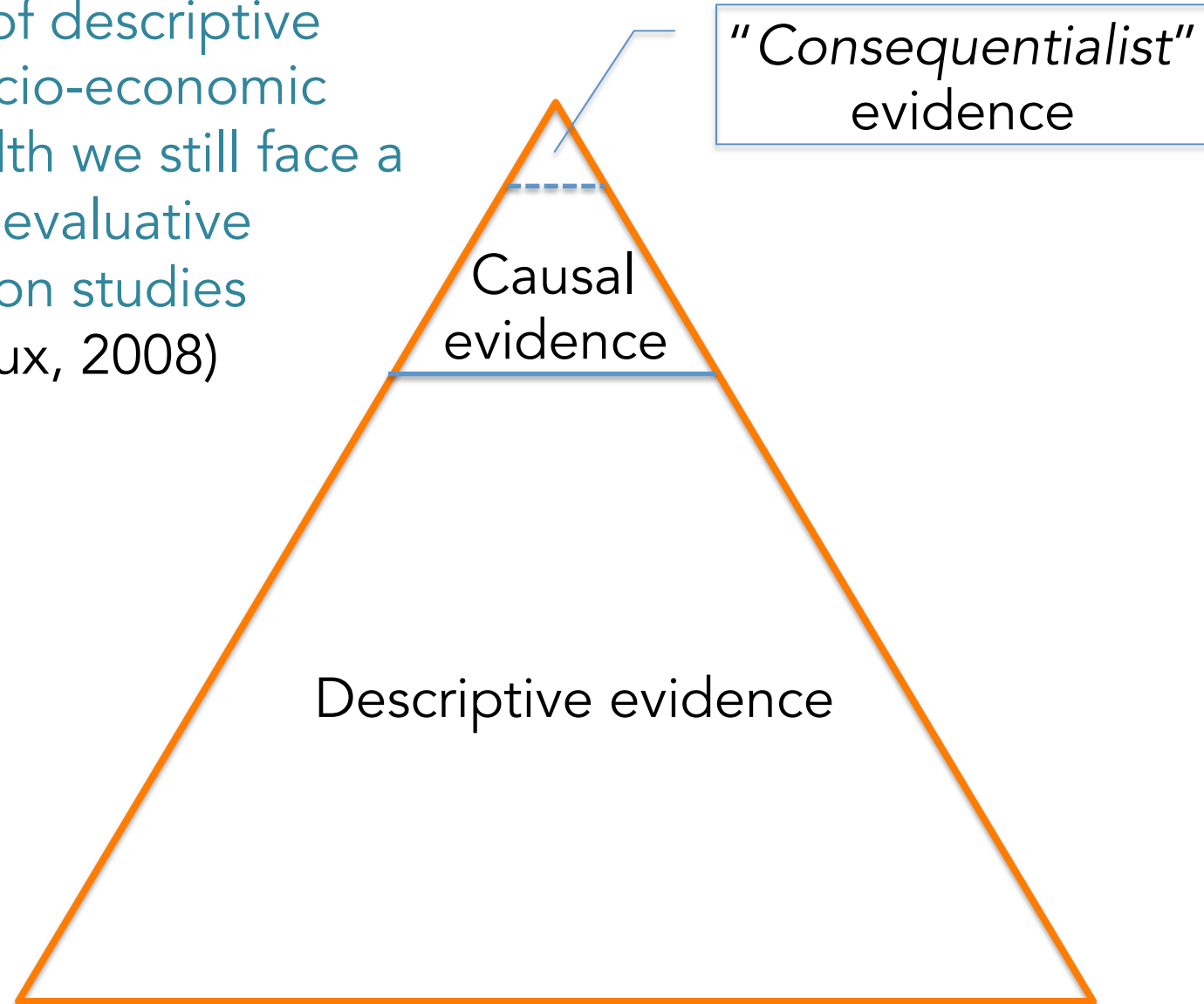
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- G. Increase access to family planning
- H. Increase access to household resources among less-educated mothers
- I. All of the above?
- J. Some of the above
- K. None of the above?

help!

....in a feast of descriptive studies of socio-economic causes of ill health we still face a famine of evaluative intervention studies (Bonneaux, 2008)





WHAT IS MACHEQUITY?

The overall objective of the Maternal and Child Health Equity (MACHEquity) research program is to examine how social policies focused on reducing poverty, income and gender inequality have an impact on the burden of disease among children and women under the age of 50.

Partnering with international NGOs and dedicated to the training and mentoring of the next generation of researchers in the field, MACHEquity joins information from household surveys with global policy data and utilizes innovative methods to investigate associations between social policies, social determinants, and health outcomes prioritized by the [United Nations Millennium Development Goals](#).

MACHEquity News

Launch of MACHEquity's Downloadable Data!

November 6, 2015

MACHEquity data dashboards are now available to the public! Check ...

MACHEquity Coinvestigator on Evidence-based Strategies for Advancing Early Child Development

September 29, 2015

MACHEquity coinvestigator Linda Richter has recently coauthored a synthesis article ...

Postdoc Farhan Majid on the in-utero consequences of Ramadan fasting

strategic questions

+ data

+ empirical methods

consequentialist evidence

strategic questions + data + empirical methods →
consequentialist evidence

- Discussions between academics and knowledge users to identify relevant research questions that can be answered

strategic questions + data + empirical methods →
consequentialist evidence

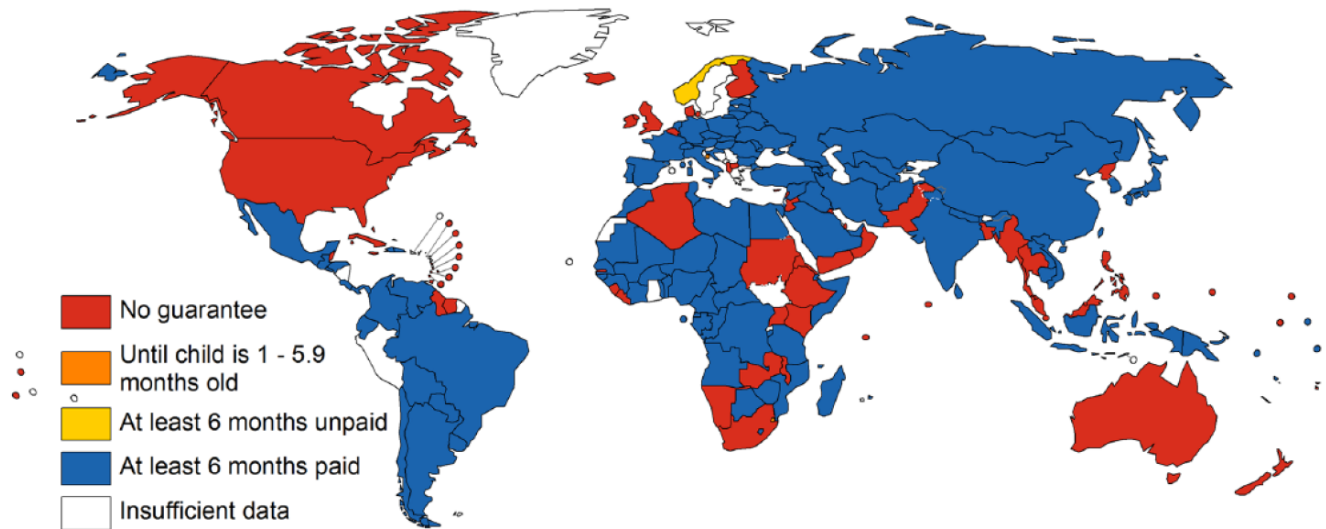
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strategic questions + data + empirical methods →
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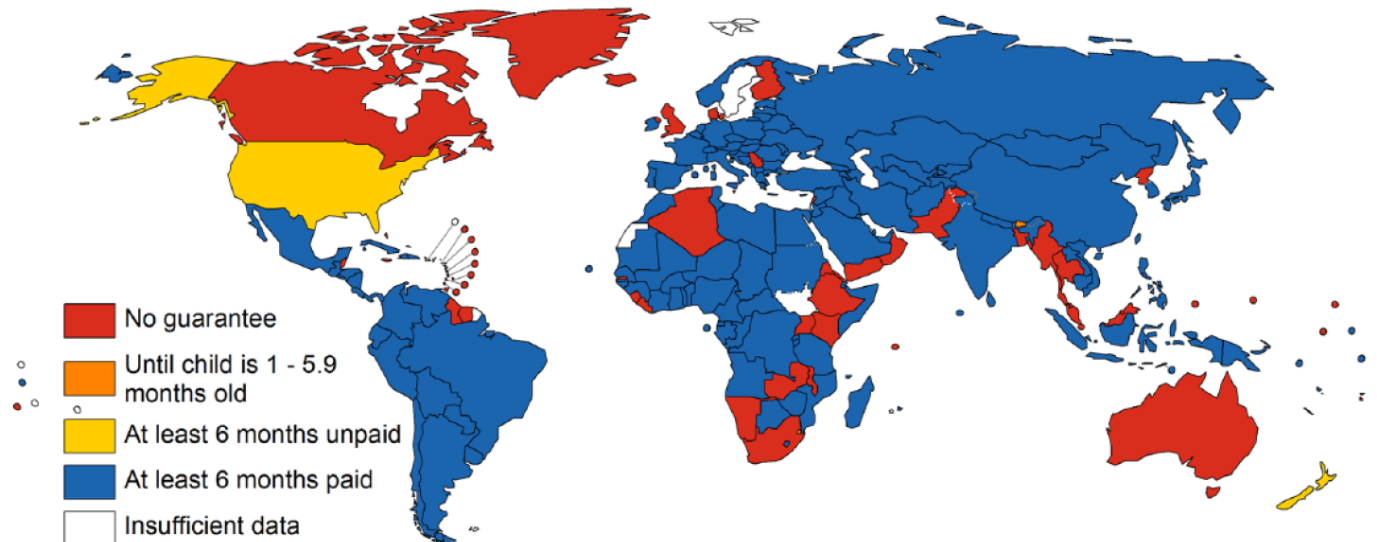
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 - Breastfeeding breaks at work (1995-current)

Were breastfeeding breaks guaranteed at work?

1995



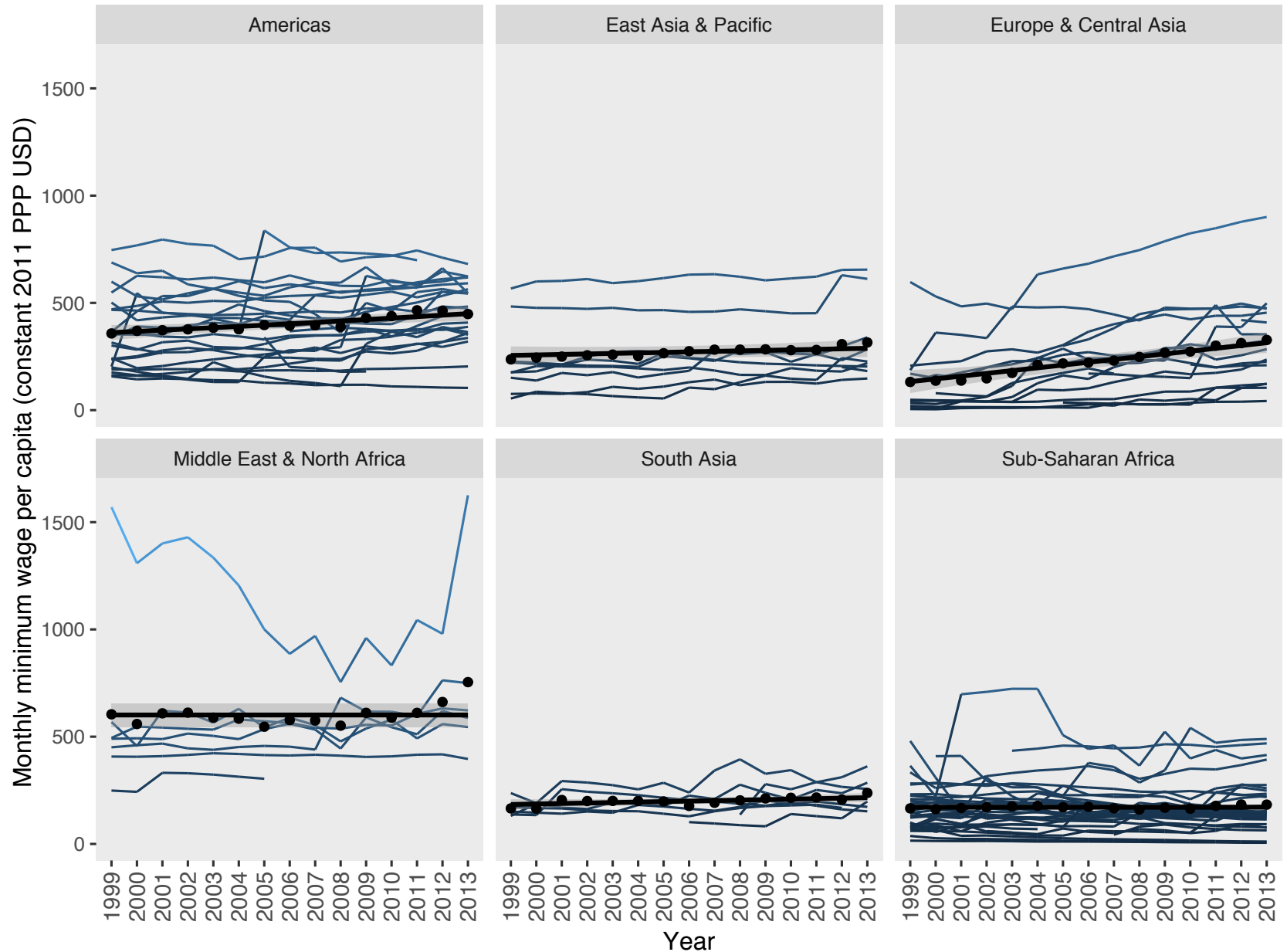
2014



strategic questions + data + empirical methods →
consequentialist evidence

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- We collect longitudinal data on social policies related to poverty, income and gender inequality for all LMICs
 - Breastfeeding breaks at work (1995-current)
 - Minimum wage (1999-current)

How have minimum wages evolved over time?



strategic questions + data + empirical methods →
consequentialist evidence

- Discussions between academics and knowledge users to identify relevant research questions that can be answered
- We collect longitudinal data on social policies related to poverty, income and gender inequality for all LMICs
 - Breastfeeding breaks at work (1995-current)
 - Minimum wage (1999-current)
 - Maternal and paternal leave policies (1995-current)
 - Minimum age of marriage (1995-current)
 - Family cash benefits (1999-current)
 - Child labour (1995-current)

strategic questions + data + empirical methods →
consequentialist evidence

- Discussions between academics and knowledge users to identify relevant research questions that can be answered
- We collect longitudinal data on social policies related to poverty, income and gender inequality for all LMICs
- Join policy data to survey data from harmonized DHS/MICS or other sources to create multilevel datasets

strategic questions + data + empirical methods →
consequentialist evidence

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- We collect longitudinal data on social policies related to poverty, income and gender inequality for all LMICs
- Join policy data to survey data from harmonized DHS/MICS or other sources to create multilevel datasets
- Apply empirical methods, including those commonly used in epidemiology and economics, to rigorously evaluate the impact of policy reforms on health and health inequality

Increased Duration of Paid Maternity Leave Lowers Infant Mortality in Low- and Middle-Income Countries: A Quasi-Experimental Study

Arijit Nandi^{1,2*}, Mohammad Hajizadeh³, Sam Harper², Alissa Koski², Erin C. Strumpf^{2,4}, Jody Heymann⁵

Background

Maternity leave reduces neonatal and infant mortality rates in high-income countries. However, the impact of maternity leave on infant health has not been rigorously evaluated in low- and middle-income countries (LMICs). In this study, we utilized a difference-in-differences approach to evaluate whether paid maternity leave policies affect infant mortality in LMICs.

Methods and Findings

We used birth history data collected via the Demographic and Health Surveys to assemble a panel of approximately 300,000 live births in 20 countries from 2000 to 2008; these observational data were merged with longitudinal information on the duration of paid maternity leave provided by each country. We estimated the effect of an increase in maternity leave in the prior year on the probability of infant (<1 y), neonatal (<28 d), and post-neonatal (between 28 d and 1 y after birth) mortality. Fixed effects for country and year were included to control for, respectively, unobserved time-invariant confounders that varied across countries and temporal trends in mortality that were shared across countries. Average rates of

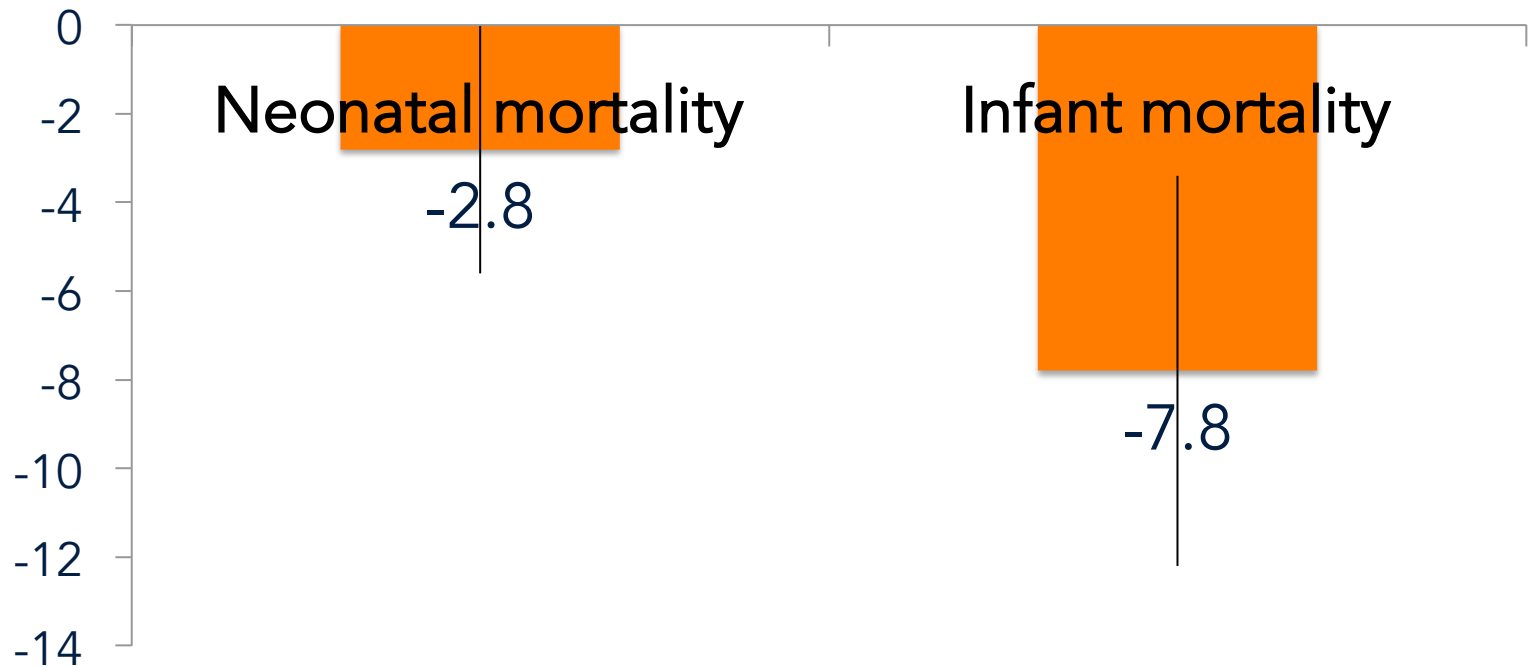
infant, neonatal, and post-neonatal mortality over the study period were 55.2, 30.7, and 23.0 per 1,000 live births, respectively. Each additional month of paid maternity was associated with 7.9 fewer infant deaths per 1,000 live births (95% CI 3.7, 12.0), reflecting a 13% relative reduction. Reductions in infant mortality associated with increases in the duration of paid maternity leave were concentrated in the post-neonatal period. Estimates were robust to adjustment for individual, household, and country-level characteristics, although there may be residual confounding by unmeasured time-varying confounders, such as coincident policy changes.

Conclusions

More generous paid maternity leave policies represent a potential instrument for facilitating early-life interventions and reducing infant mortality in LMICs and warrant further discussion in the post-2015 sustainable development agenda. From a policy planning perspective, further work is needed to elucidate the mechanisms that explain the benefits of paid maternity leave for infant mortality.

Increased leave lowered infant mortality.

Change in mortality/1000 live births
for each month of paid leave*



*results were robust to adjustment for individual, household, and country-level characteristics, including the wage replacement rate, GDP per capita, female labor force participation, government health expenditure per capita, and total health expenditure per capita

This is hard.

- We measure national policies, although there may be sub-national variations in social policy approaches
- Comprehensive information about implementation is limited globally—we try to measure *intention-to-treat effects*
- Cross-national data is limited at the individual- or household-levels for specific health targets (e.g., maternal mortality)
- Standard threats to internal validity apply, including the potential for unmeasured confounding & measurement error

Recommendations.

- Invest in global data infrastructure for tracking trends in social policy approaches and development related targets
- Integrate quasi-experimental methods (i.e., ITS, DD, IV, RD) into our public health & epidemiologic pedagogy
- Involve “knowledge users” in the research process to help identify research gaps and specify policy-relevant questions
- Encourage reviews for systematically synthesizing results, identifying research gaps, understanding heterogeneity, and reducing redundancies

THANKS!

KEY COLLABORATORS:

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FOR FURTHER INFORMATION SEE WWW.MACHEQUITY.COM