

Trends in cause-specific mortality among children aged 5–14 years from 2005 to 2016 in India, China, Brazil, and Mexico: an analysis of nationally representative mortality studies

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Background

- Almost 1 million children aged 5-14 years died in 2016. (United Nations Inter-Agency Group for Child Mortality Estimation [UN-IGME], 2018)
- The causes of their death and how those have changed over times has not been well studied or reported.
- Direct evidence of causes of death are not routinely collected in many lower and middle income countries, where most of the estimated deaths for children aged 5-14 years occur.
- **India, China, Brazil, and Mexico have more than ten years of high quality, nationally-representative mortality data.** We provide direct evidence from these sources on how causes of death for children aged 5–14 years for India, China, Brazil, and Mexico changed from 2005 to 2016.
- **These four countries account for 40% of 1.2 billion children aged 5-14 years (UNWPP, 2017) and ~23% of deaths for this age group (UN-IGME, 2018).**

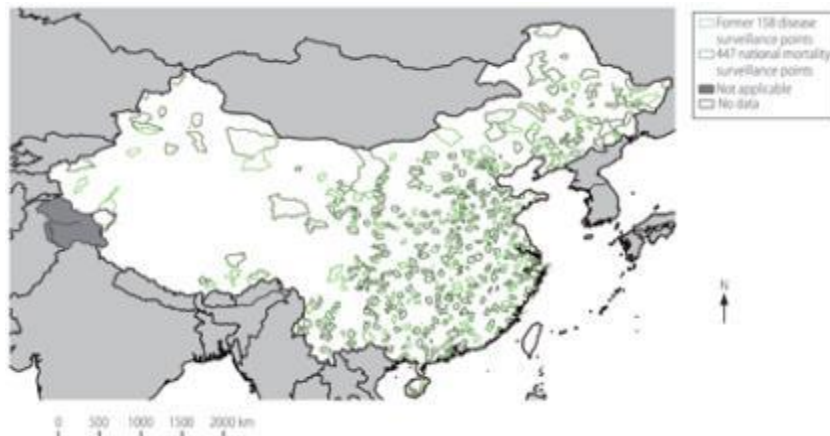
Key messages

- Most deaths of children aged five to 14 in India, China, Brazil and Mexico arise from preventable or treatable conditions.
- In India, death rates from communicable diseases such as pneumonia, tuberculosis and vaccine-preventable diseases were nearly 20 times higher than in China, and 10 times higher than in Brazil and Mexico.
- China saw more deaths by drowning than any of the other countries. Boys aged five to 14 had higher death rates than girls from nearly all injuries.
- Higher suicide rates for girls than boys in India, but not the other countries. Increasing rates of interpersonal violence for boys 10-14 in Brazil.
- Deaths from road traffic injuries, neurological conditions, drowning and childhood cancers were common leading causes in all four countries.

Nationally-representative data sources: Sample systems

China (2004-2010, 2012-16)

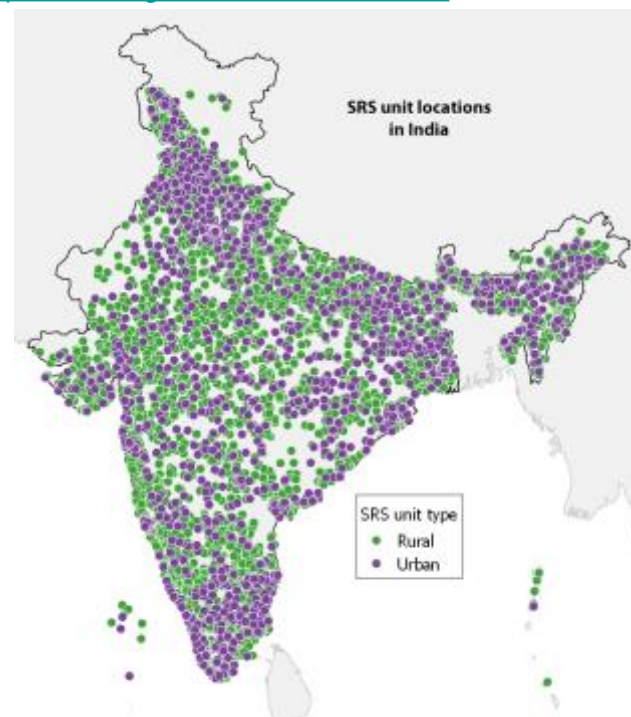
China's Disease Surveillance Points (DSP) is sample-based mortality surveillance system coordinated by the Chinese Center for Disease Control and Prevention. The DSP expanded from 161 sites in 2004 to 605 sites covering 324 million people in urban and rural areas in 2013, making it provincially-representative. The integrated mortality system combined the maternal and child surveillance, DSP, and vital registration since 2013.



Liu et al. *Bulletin of the World Health Organization* 2016;94:46-57.
doi: <http://dx.doi.org/10.2471/BLT.15.153148>

India (2005-2013)

The Registrar General of India implemented the Million Death Study within the Sample Registration System. Births and deaths were monitored in over 1.3 million homes in over 7000 randomly selected areas from the previous national census. Verbal autopsy records were each double coded by 2 of 400 trained physicians.



(http://censusindia.gov.in/2011-Common/Sample_Registration_System.html).

Nationally-representative data sources: Vital registration

Mexico (2005-2016)

Mexico's vital registration mortality data are publically available (<http://www.inegi.org.mx/>) from *Mexican Instituto Nacional de Estadística y Geografía (INEGI)*. Nearly 95% of deaths in Mexico are registered and less than 2% of the causes are ill-defined, indicating the high quality of medical certification.

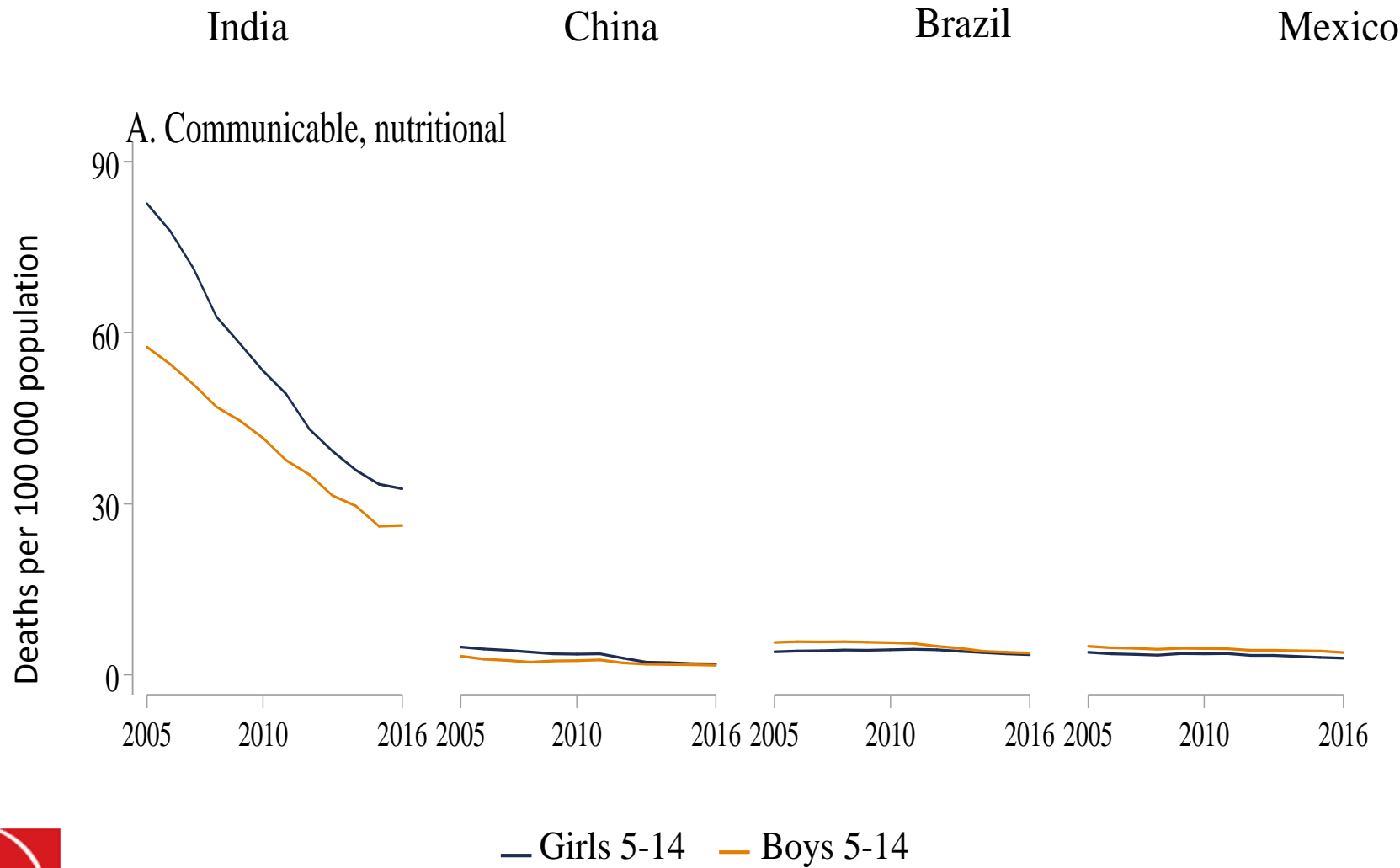


Brazil (2005-2016)

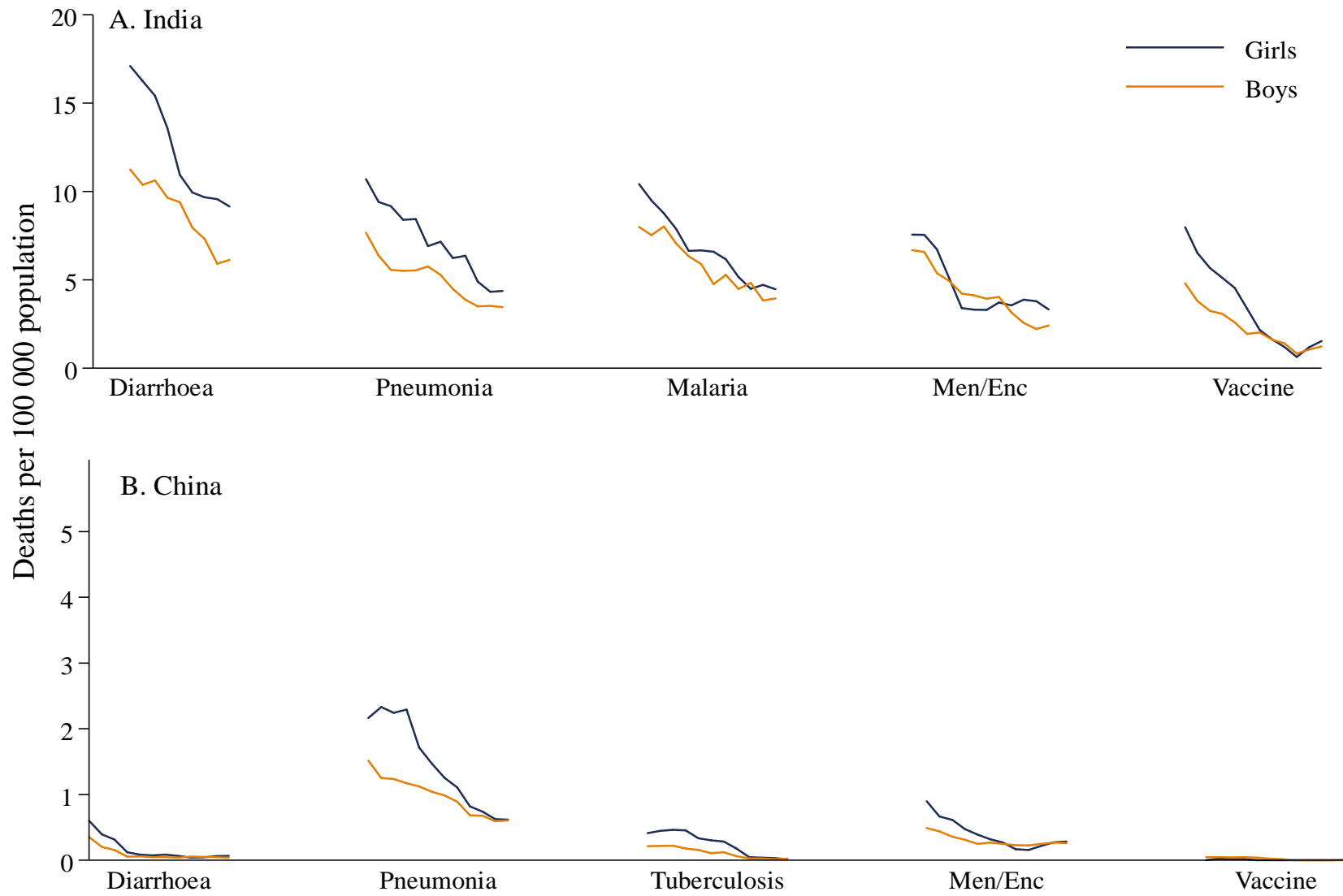
Brazil's vital registration mortality data is publically available. For causes of death from the *Brazilian Ministry of Health's Banco de dados dos Sistemas de Informação sobre Mortalidade (SIM)* (<http://datasus.saude.gov.br/informacoes-de-saude/servicos2/transferecia-de-arquivos>). Population level from the *Brazilian Institute of Geography and Statistics*. More than 90% of deaths are registered, but with wide regional variation in quality.



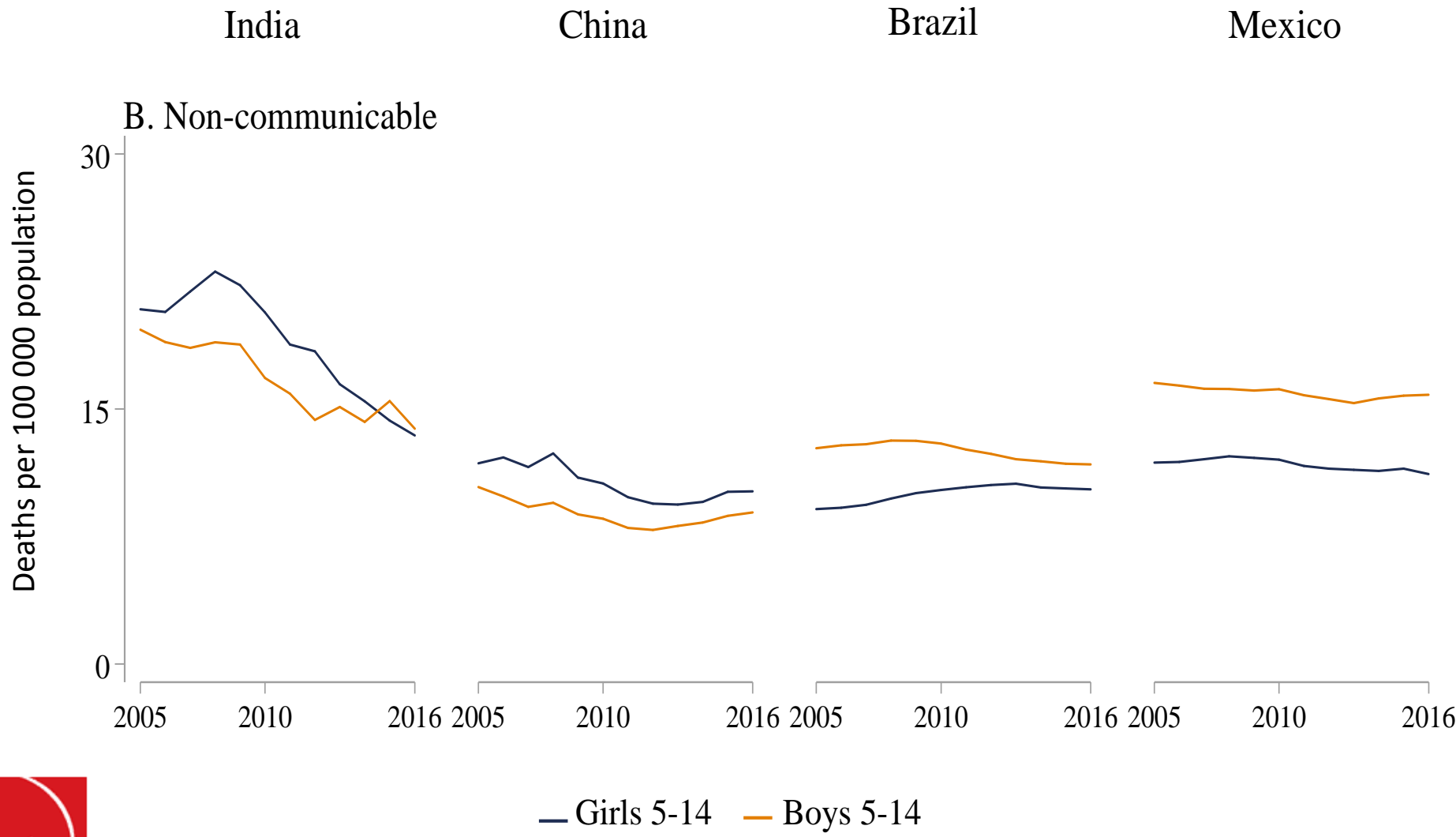
Death rates from communicable causes, especially for girls, in India were 20 times higher than in China and 10 times higher than in Brazil and Mexico



Sharp declines in preventable communicable causes, such as diarrhoea, pneumonia, and vaccine preventable diseases in India and China

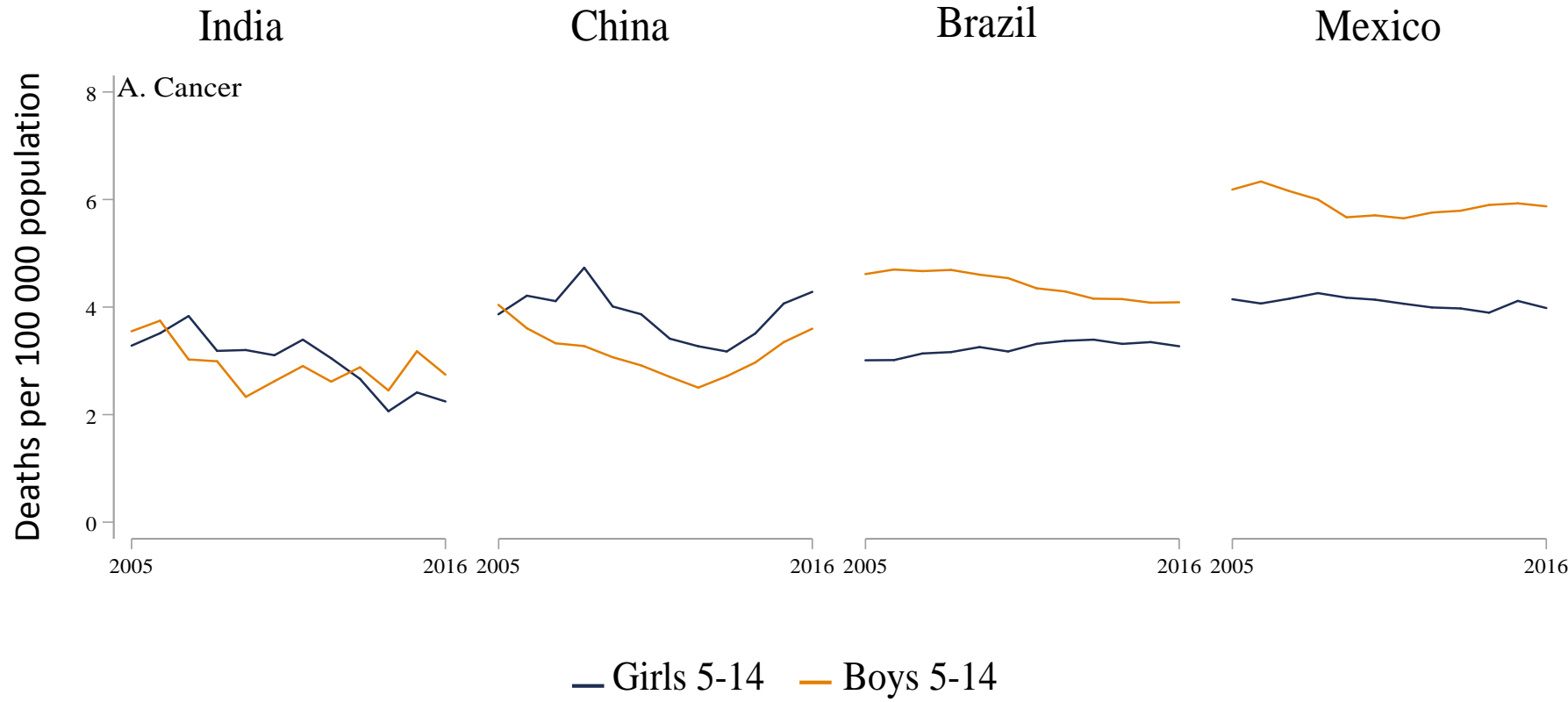


India has higher baseline death rates for non-communicable COD than China, Brazil, and Mexico

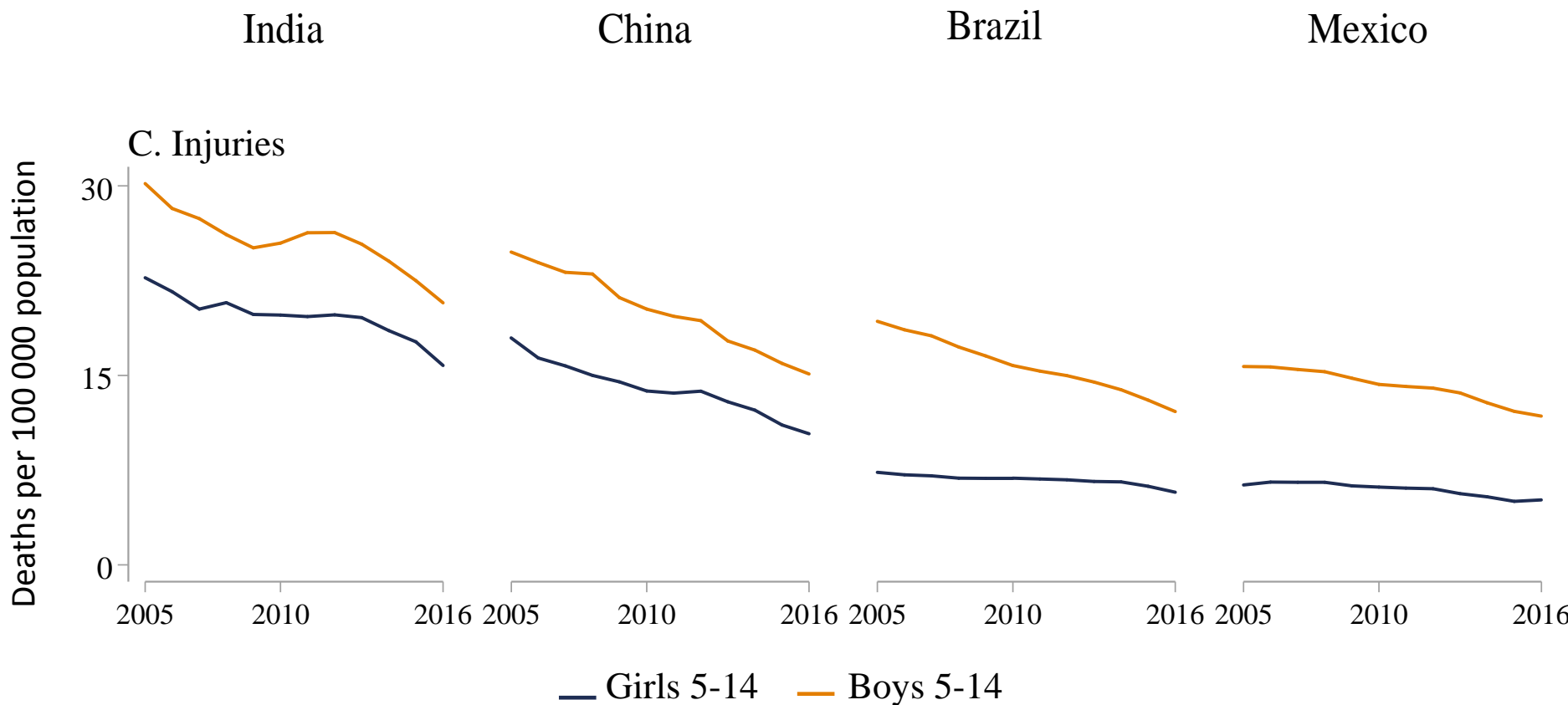


Highest death rates from NCDs were for Cancer and Neurological disease. Boys had higher death rates from cancer, particularly in Mexico and Brazil.

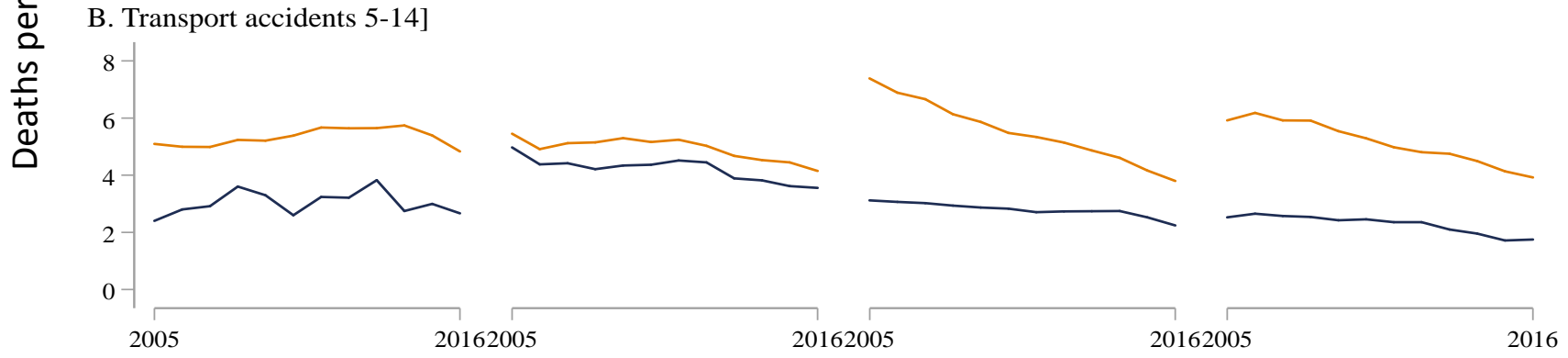
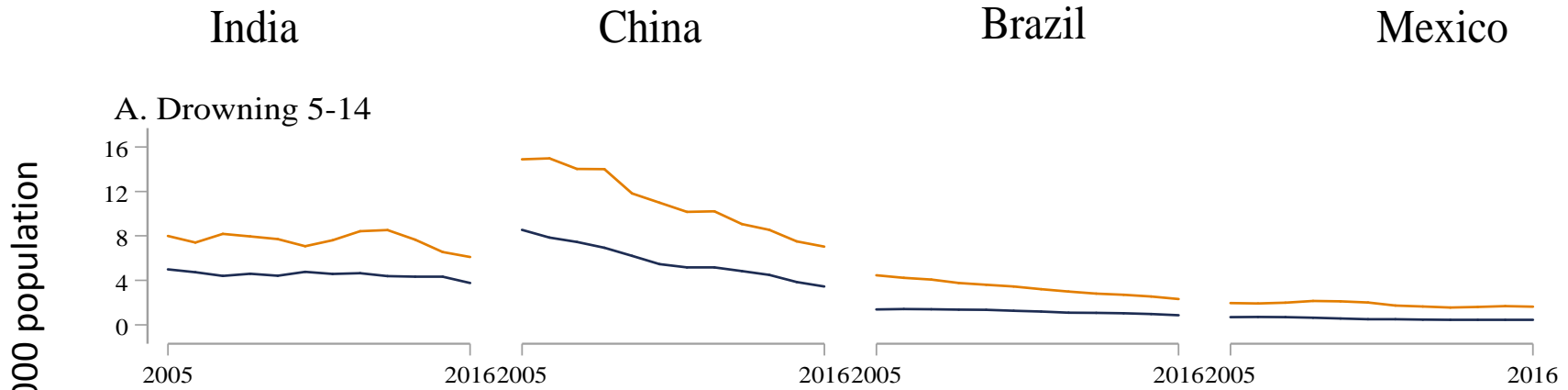
Cancer



Highest death rates in China, Brazil, and Mexico are from injuries for boys

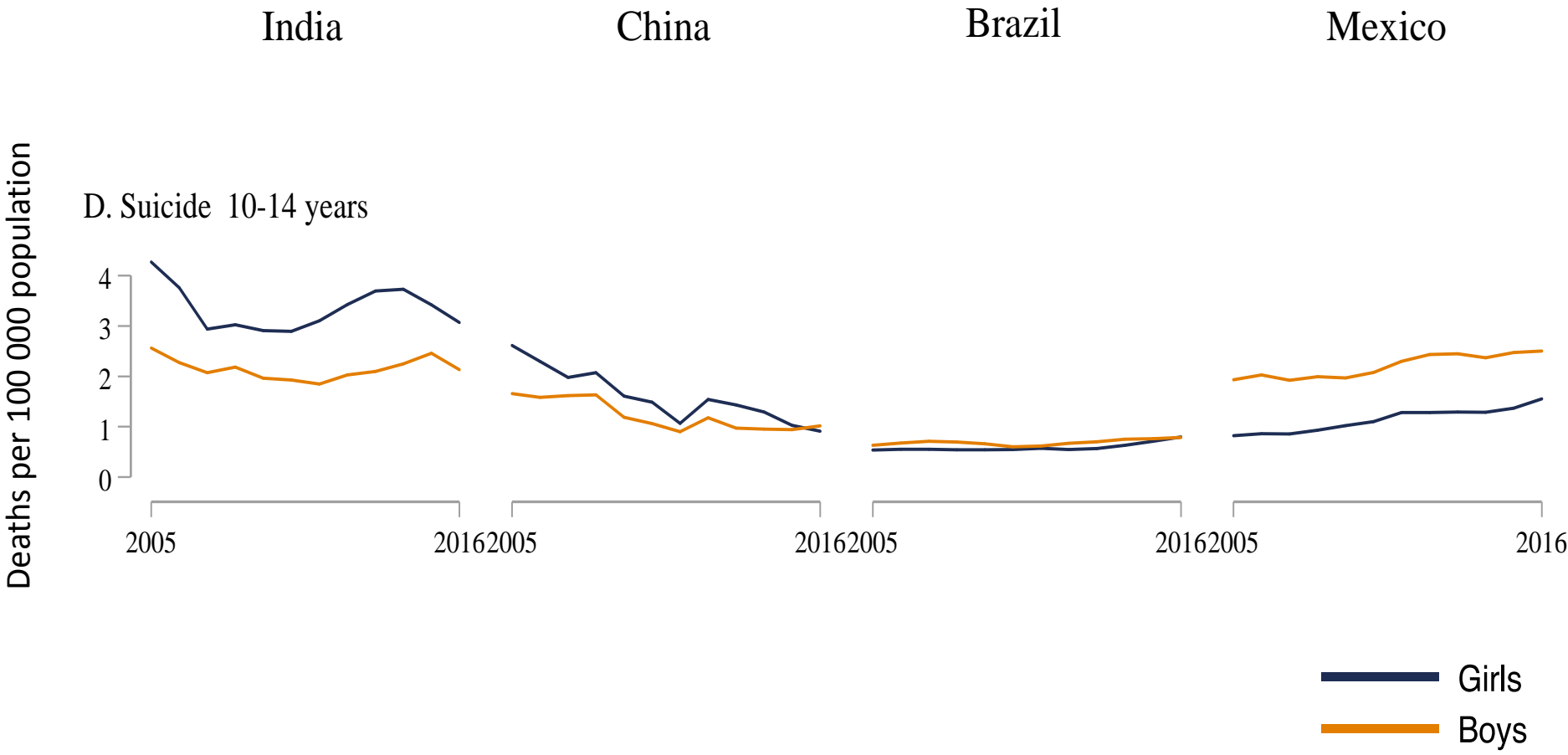


Decreasing road traffic mortality in Brazil and Mexico for children aged 5-14 years. High death rates from drowning in China and India, especially for boys.

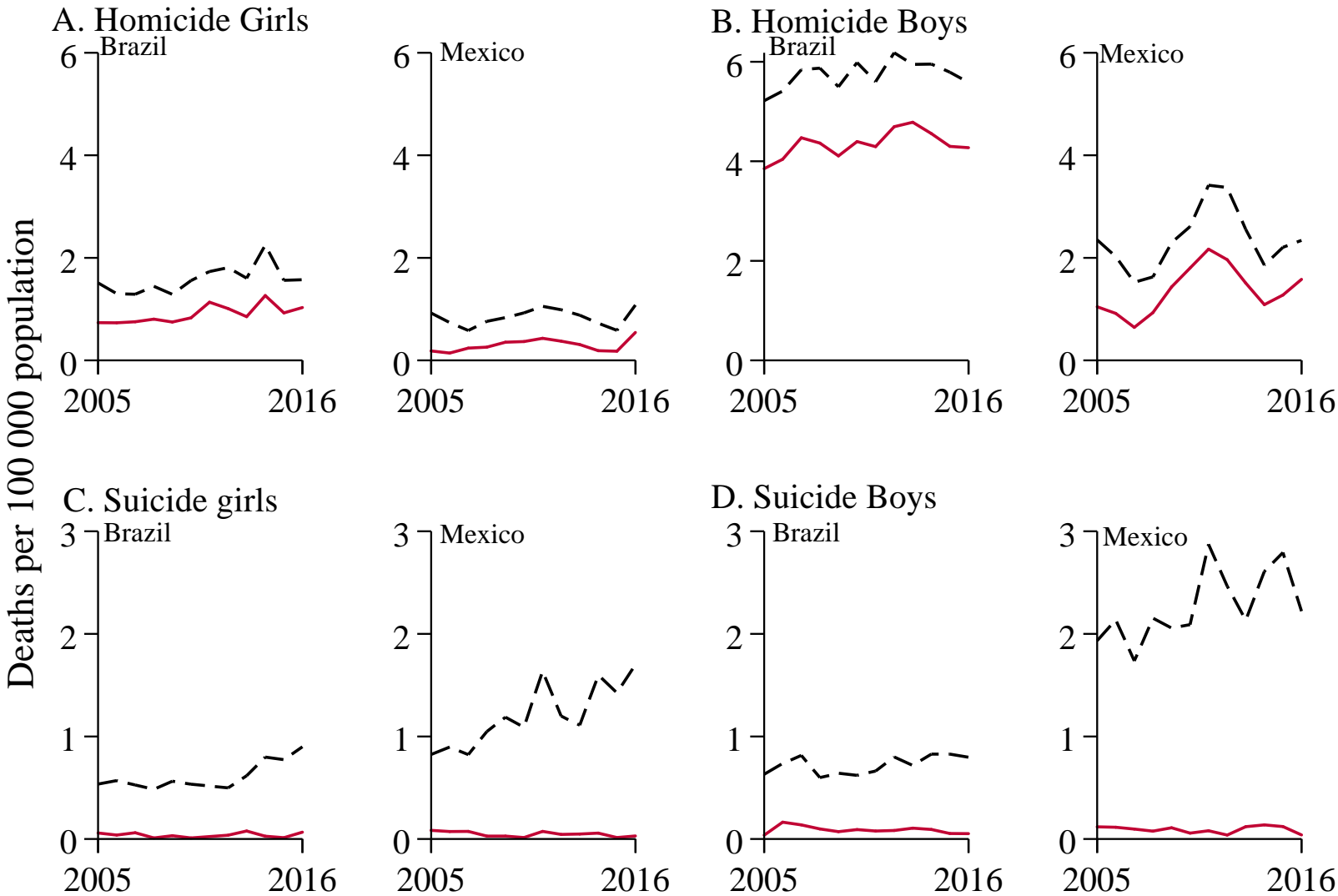


— Girls
— Boys

More girls than boys commit suicide in India and China, but unlike in India suicide mortality sharply declined in China. Suicide mortality is increasing in Mexico.



Majority of homicides, and not suicides, for children aged 10-14 years in Brazil and Mexico were fire-arm related



--- All homicide or suicide — Firearm related



Implications

- Understanding causes of death provides clear targets for prevention and treatment
- Effective interventions to reduce child mortality exist and would need to include non-communicable causes and injuries. Country efforts to meet SDG targets for tuberculosis, malaria, cancer, suicide, and road traffic mortality should extend to children aged 5-14 years.
- Major limitation was the inability to include data from other high mortality low and middle income countries, esp. in Sub-Saharan Africa. Improved coverage and quality of direct mortality data are needed to measure progress in reducing these death.

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- **Link to full paper and appendix (free)**
- **Press Release**
- **PowerPoint Presentation**
- **Link for data request**
- **Video Press Release**
- **Links to Other CGHR Research**



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