

Disadvantages of having an adolescent mother

We recently reported associations between maternal age at childbirth and outcomes in the offspring, using data from five birth cohorts (COHORTS collaboration) in low-income and middle-income countries (LMICs), in *The Lancet Global Health*.¹ Young maternal age (<19 years) was associated with lower offspring birthweight, gestational age, childhood nutritional status (weight-for-age and height-for-age at 2 years), and attained schooling, and higher adult glucose concentration, compared with offspring of mothers aged 20–24 years. These associations were independent of maternal socioeconomic status, height, and parity.

After publication, the Health, Nutrition, and Population Global Practice at the World Bank asked us for a more detailed analysis of the younger maternal age group to inform policy discussions on adolescent pregnancy, in particular whether the children of the youngest teenage mothers had the worst outcomes. We now present separate estimates for each year of maternal age between 15 and 19 years, and the significance of trends across this age range.

The analysis uses data of 19 403 women, of whom 2472 were aged 15–19 years: 912 from Brazil, 283 from Guatemala, 411 from India, 382 from the Philippines, and 484 from South Africa (appendix, p 12). Linear regression in pooled data from all five cohorts was used to estimate, for each maternal age, the amount (with 95% CIs) by which each outcome differed from the offspring of mothers aged 20–24 years. Model 1 was adjusted for sex and adult age (for adult outcomes only). Model 2 was further adjusted for maternal marital status, schooling, wealth index, race (Brazil and South Africa only), and urbanicity (Philippines only). Model 3 was further adjusted for maternal height, parity, and

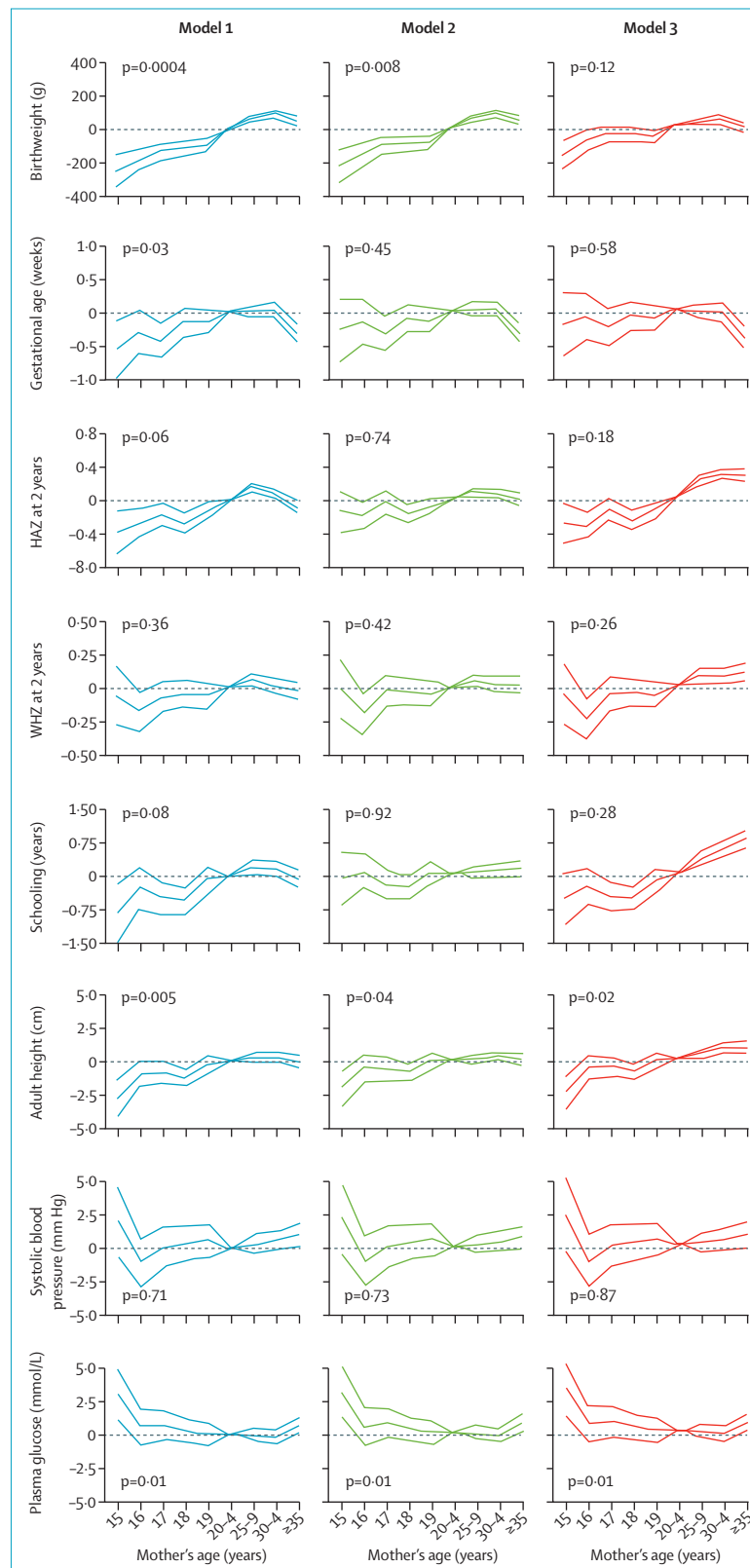


Figure: Association of maternal age with important health outcomes

The p values indicate the significance of the linear trend in estimates across the age range 15–19 years. HAZ=height-for-age Z score. WHZ=weight-for-height Z score.

breastfeeding duration (for postnatal outcomes only).

Within the 15–19-year age group, younger mothers had less schooling and were more likely to be primiparous ($p < 0.0001$ for both); there were no trends in percentages married, wealth index, urbanicity, race, or height (appendix, pp 13–16). Younger maternal age was also associated with several offspring characteristics: lower birthweight, gestational age, and adult height, and higher adult plasma glucose concentrations (figure). There was no significant association with birthweight in model 3, predominantly because of adjustment for maternal parity. The gestational age association was not significant in model 2, predominantly because of adjustment for race. The adult height and plasma glucose associations remained significant after full adjustment. The findings were unchanged after adjusting for the year of birth of the child.

We conclude that, in LMICs, newborn, child, and adult offspring who were born to mothers aged 15–16 years are at a clear disadvantage compared with those born to mothers aged 19 years or older, in terms of important health outcomes. Their lower birthweight is partly associated with the fact that they are often firstborns. Adolescent marriage and childbearing remain common in many LMICs^{2,3} and our findings support continued and strengthened measures to encourage delaying a first pregnancy until as late as possible in the mother's teenage years, and better still to wait until her early twenties.

We declare no competing interests.

Copyright © The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY license.

*Caroline H D Fall, Clive Osmond,
Dominic S Haazen,
Harshpal Singh Sachdev, Cesar Victora,
Reynaldo Martorell, Aryeh D Stein,
Linda Adair, Shane Norris,
Linda M Richter, and the COHORTS
investigators
chdf@mrc.soton.ac.uk

MRC Lifecourse Epidemiology Unit, University of Southampton SO16 6YD, UK (CHDF, CO); Health, Nutrition and Population Global Practice, World Bank, Washington, DC, USA (DSH); Sitaram Bhartia Institute of Science and Research, New Delhi, India (HSS); Universidade Federal de Pelotas, Pelotas, Brazil (CV); Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA, USA (RM, ADS); Department of Nutrition, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA (LA); Medical Research Council Developmental Pathways for Health Research Unit, Witwatersrand University, Johannesburg, South Africa (SN); and Human Sciences Research Council, Durban, South Africa (LMR)

- 1 Fall CH, Sachdev HS, Osmond C, et al, the COHORTS investigators. Associations between maternal age at childbirth and adult outcomes in the offspring: a prospective study in five low-income and middle-income countries (COHORTS collaboration). *Lancet Glob Health* 2015; **3**: e366–77.
- 2 United Nations Population Fund. *Marrying too young: end child marriage*. New York: UNFPA, 2012. <https://www.unfpa.org/sites/default/files/pub-pdf/MarryingTooYoung.pdf> (accessed Aug 29, 2016).
- 3 UN Population Division. *World marriage patterns 2000*. New York: UN Population Division, 2000. <http://www.un.org/esa/population/publications/worldmarriage/worldmarriagepatterns2000.pdf> (accessed Aug 29, 2016).