

# The intergenerational transmission of health in developing countries

A harsh indicator of poverty and inequality in poor countries is the prevalence of under-nutrition, which combines with infectious disease to produce widespread morbidity and mortality. Scarce resources are often allocated preferentially to sons even in countries without a marked preference for sons, possibly because the pecuniary return to investment in sons is perceived to be higher, whether because of their greater labour market attachment or the prerogatives that property rights confer on them.

Our research suggests that this behaviour may be myopic since investments in the nutrition and health of women have an intergenerational payoff, improving the survival and health of future generations.

Previous studies have established the importance of good health in raising educational attainment and productivity, and of poor health in generating poverty traps. Together with evidence of the impact of education and income on health in poor households and of 'assortative matching' in marriage, this implies that intergenerational persistence in health may explain some of the intergenerational persistence in education, earnings and economic inequality.

## **There is a strong and widespread tendency for children born to relatively unhealthy mothers to start life in poor health**

Our analysis uses comparable micro data on 2.24 million children born to about 0.6 million mothers in 38 developing countries in the 31 year period, 1970-2000. The research makes two main contributions. It presents the first estimates of the intergenerational transmission of health across countries and over time; and it investigates the extent to which environmental conditions around the birth of a child mediate the intergenerational transmission of health.

A mother's health is indicated in our research by her height, body mass index (BMI) and anaemia status. Child health is

indicated by mortality risk and 'anthropometric failure', namely, low birthweight and stunted growth.

We find that short stature and anaemia of the mother each raise the likelihood that her children are low birthweight, suffer early life mortality and exhibit stunted growth. Low maternal BMI is a risk factor in low birthweight and stunting, while high BMI is a risk factor for childhood mortality. A one standard deviation decrease in mother's height or BMI raises the risk of poor child health by between 5% and 10%, depending on the outcome. The intergenerational transmission of health is a widespread phenomenon, statistically significant in between 21 and 29 of the 38 countries, depending on the measure.

## **The intergenerational transmission of health appears to be weakened by improvements in income, maternal education and public health provision**

There is stronger intergenerational persistence at the low end of the mother's health distribution. We may therefore expect average persistence to decline with improvements in maternal health. Alternatively, positive trends in public health programmes that effectively target children at most risk will tend to weaken persistence.

Investigating this for the 31 cohorts in 1970-2000, we find an erosion of about 20-30% per decade in the link between child mortality and mother's height. This looks fairly impressive, especially in view of the record of limited income and education mobility. But disaggregation by continent reveals that Latin America alone exhibits a consistent improvement in health mobility through the period, with rates of decline twice as large as the average rates. Asia shows no significant trend and Africa shows a worsening trend, especially for neonatal mortality.

These results indicate that children born to relatively unhealthy mothers in relatively poor regions in Africa and Asia start life in

**To what extent are children's health outcomes determined by their mothers' health? *Sonia Bhalotra* and *Samantha Rawlings* analyse three decades' worth of data on over two million children across 38 developing countries to explore how health is transmitted across generations – and how public policy can respond.**

poor health. The penalty they incur has shown no tendency to fade in the last 30 years, a period in which children born to better off mothers in these and other regions have prospered. The natural question for public policy concerns the extent to which differences in health at birth between children can be narrowed, so that children from disadvantaged families start life with more equal opportunities.

**Improvements in the socio-economic environment at birth generate greater payoffs in less healthy families**

Exploiting within-continent heterogeneity in trends in income and health, we test the hypothesis that the decline in the intergenerational transmission of health between cohorts separated by two decades has been faster in countries that recorded positive growth than in countries that experienced stagnation or negative growth. This 'experiment' is possible with these data because of the sharp diversity of growth experiences of developing countries in the last three decades. We find that economic growth is associated with a weakening of the tie between mother and child health.

But it is unclear whether this benefit is attributable to income since long-range growth is potentially confounded with other changes, such as medical technological progress. We therefore investigate the sensitivity of the intergenerational transmission of health to annual changes in aggregate income, mother's education and public health (indicated by immunisation rates).

We find that improvements in mothers' education, immunisation rates and income in the country and cohort of the index child weaken the intergenerational transmission of health. The gains from improvements in immunisation rates are evenly distributed, but the gains from improvements in income and maternal education are greatest for children who are initially most disadvantaged by being born of relatively unhealthy mothers. These results also suggest that children are more likely to bear

the scars of poor maternal health if they are conceived or born in adverse socio-economic conditions.

Our finding that maternal stature has a substantial negative influence on a range of measures of child health contributes to evidence that adult height is an indicator of health. The finding that adult height is especially sensitive to the early childhood environment, together with our finding that children of shorter mothers are more sensitive to changes in the socio-economic environment, suggests that the intergenerational transmission of health involves not only genomic but also non-genomic mechanisms.

**Investments in the nutrition and health of women have an intergenerational payoff, improving the survival and health of future generations**

This research contributes unique evidence on an important and under-studied aspect of persistent inequality in developing countries, where underdeveloped markets and states result in children often being unable to escape from the family circumstances into which they are born. It paints the first broad-brush picture of the persistence of health across generations, while also presenting continent- and country-specific estimates and evidence on how the transmission of health may be weakened by improvements in income, maternal education and public health provision.

**This article summarises two studies by *Sonia Bhalotra* and *Samantha Rawlings*: 'Gradients of the Intergenerational Transmission of Health in Developing Countries' and 'Intergenerational Persistence in Health in Developing Countries: Trends and Country Differences' (<http://www.efm.bris.ac.uk/ecsr/bhalotra.htm>).**