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The impact of adult and non-adult mortality on development: Two centuries evidence from a panel of industrial countries

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Abstract

This study examines the effects of adult and non-adult mortality on the long-run level of income in a heterogeneous dynamic and cross-sectionally dependent panel. Employing data for 20 countries between 1800 and 2010, it is found that (i) while non-adult mortality has no long-run effect on GDP per capita, reductions in adult mortality lead to statistically and economically significant increases in the long-run level of per capita income; (ii) there are no significant differences in the long-run effects of adult mortality and non-adult mortality on GDP per capita before and after the onset of the demographic transition; and (iii) mortality in middle adulthood has the greatest impact on economic development, whereas early adulthood mortality and mortality in later adulthood have little to no impact on the long-run level of per capita income. © 2019 The Society for Policy Modeling. Published by Elsevier Inc. All rights reserved.

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1. Introduction

Although many researchers and policy makers believe that reductions in mortality lead to increases in income per capita, empirical work has not yielded consistent results: Some studies,

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such as Knowles and Owen (1999) and Aghion, Howitt, and Murtin (2011), find a positive influence of improvements in life expectancy at birth on GDP per capita growth; others, including Bloom, Canning, and Fink (2014) and Hansen (2014), fail to uncover a robust causal effect of life expectancy at birth on GDP per capita growth; still other studies, such as Acemoglu and Johnson (2007), Acemoglu and Johnson (2014) and Hansen and Lønstrup (2015), find a negative effect of life expectancy at birth on GDP per capita; finally, there is a study by Cervellati and Sunde (2011) suggesting that the effect of life expectancy at birth on economic growth is insignificant or negative before and positive after the demographic transition from high to low fertility and mortality.

In general, this literature focuses either on a summary measure for all age-specific mortality rates, such as life expectancy at birth, or on a measure of adult or infant/child mortality. Thus, the question of whether the effect of adult mortality on GDP per capita differs from that of non-adult mortality has received little attention in the empirical literature, despite its obvious economic importance.

In one of the few studies on this issue, Lorentzen, McMillan, and Wacziarg (2008) use cross-country annual data averaged over the period 1960–2000 for a sample of up to 94 countries and find in OLS and instrumental variable (IV) regressions a significant negative effect of both infant mortality (measured by the probability of dying before age 1 year) and adult mortality (measured by the probability of surviving to age 60 years, conditional on surviving to age 15 years) on economic growth. However, when they estimate a simultaneous-equations system where the potential growth effects of infant and adult mortality are modeled via possible indirect effects on physical capital investment, secondary schooling, and fertility, they find a statistically significant negative effect of adult mortality and an insignificant effect of infant mortality.

In the same paper, Lorentzen et al. (2008) also report fixed effects, random effects, and between estimates based on an unbalanced 10-year panel covering the period 1970–2000 for up to 19 Indian states. Consistent with the results from their simultaneous equations model, they find in these regressions that reductions in the adult mortality rate (of males aged 20–40) are significantly associated with increases in economic growth, whereas the infant mortality rate (per 1000 live births) is not significantly associated with growth.

In a related study, Aghion, Howitt, and Murtin (2011) use the cross-sectional data from the study of Lorentzen et al. (2008) to estimate OLS regressions of time averaged growth rates on time averaged infant and adult mortality data as well as OLS regressions of time averaged growth rates on initial levels of infant and adult mortality. In all these regressions, which are based a sample of 94 countries for the 1960–2000 period, the coefficients of infant and adult mortality are negative. However, while the infant mortality variable is always statistically significant, they find in one regression that lower adult mortality is not significantly associated with higher growth.

Using 10-year panel regressions covering 28 OECD countries over the 1960–2000 period, Aghion et al. (2011) also find that life expectancy at birth is significantly positively related to growth in GDP per capita, whereas life expectancies at ages 40, 60, and 80 are insignificant when included together with life expectancy at birth. From this finding, Aghion et al. (2011, p. 21) conclude that “reducing mortality below age 40 is particularly growth-enhancing.”

A final paper related to this issue is Acemoglu and Johnson (2007), who consider not only the impact of life expectancy at birth on GDP per capita but also that of life expectancy at age 20. Using long-difference specifications, where the change in the dependent variable between two time points is regressed on the change in the independent variables between the same two time points, they find in cross-sectional IV regressions for up to 45 countries for 1940–1980 and

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