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Can public spending reduce mortality disparities? Findings from East Germany after reunification

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ABSTRACT

Following the reunification of Germany, eastern Germans experienced large increases in life expectancy. The introduction of the West German welfare system was accompanied by mortality reductions, particularly for older East Germans. We use this natural experiment to investigate to what extent increased public social security transfers contributed to the rise in life expectancy. We find that every euro invested in East German pensions and health care yielded on average three hours of additional life expectancy. The rise in public spending was particularly beneficial for older age groups. Investments in health care were more beneficial for reducing all-cause mortality in the East. Still, investments in pensions were important for closing the life expectancy gap to West Germany. Our results suggest that public policy measures geared toward equalizing living standards can also help to narrow mortality differentials.

Background

There is an ongoing discussion about the relationship between increases in public spending and increases in life expectancy. Most researchers have emphasized the costs associated with rising life expectancy, mainly due to the expenses incurred by older age groups. Some observers have warned that changing age structures within a population and increasing proportions of older age groups will lead to higher public pension costs (Bongaarts, 2004; Jimeno et al., 2008; Börsch-Supan et al., 2003) or health care expenditures (Schulz et al., 2004; McGrail et al., 2000; Anderson and Hussey, 2000). Fewer researchers have examined the impact of public expenditures on rising life expectancy (Murphy and Topel, 2005; Cutler et al., 2006a; Mackenbach et al., 2011). Although these studies have shown that investments in health care can result in lower mortality at the individual level (Farahani et al., 2010), this was found within countries, but not between countries. Several studies have shown that health care expenditures account for only a fraction of inter-country health differentials (Filmer and Pritchett, 1999; Musgrove, 1996). These researchers asserted that income or poverty determine individual health and mortality to a larger extent than public health expenditures. Indeed, a correlation between income and mortality was found in many studies (Smith, 1999). Preston (1975) showed that countries with higher per capita income have lower mortality than those with lower income, which implies that the level of life expectancy of a country is based on its national income. However, this relationship holds true only up to a certain income threshold; beyond this threshold, additional income does not yield further gains in life expectancy (Deaton, 2003). Thus, some scholars have argued that it is not only the income gradient between countries but also the degree of income inequality within countries that lead to the development of different mortality patterns in comparable countries (Subramanian and Kawachi, 2004; Kitagawa and Hauser, 1973; Wilkinson and Pickett, 2006; Wilkinson, 1996; Lynch et al., 2000). The evidence also suggests, however, that income levels cannot fully explain rising life expectancy levels, and that health care spending and investments in health care technology should also be taken into account (Cutler et al., 2006b).

We seek to add to this discussion by addressing the question of whether converging social spending levels lead to converging life expectancy levels by looking at trends in public health care and pension spending. We make use of the division and reunification of Germany, a large natural experiment in which a single population was artificially separated and experienced very different social, economic, and political conditions for four decades. After the Fall of the Berlin Wall and the subsequent adoption of the West German social security system, public spending rose significantly in the East and converged to the West German level. Elderly East Germans benefited most from this process, as their retirement benefits rose sharply, and they started receiving care through the modern health care system imported from the West. At almost the same time, life expectancy in the East, which had been falling

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behind that of the West since the 1970s, started to increase, and eventually caught up to West German levels. By focusing on the elderly, we avoid factors such as migration or education to affect our results.

In order to quantify the impact of public spending, especially of increasing health care and pension spending, we proceed as follows. First, we present the development of life expectancy in the two parts of Germany since the 1970s. We calculate a Lee-Carter forecast for East Germany to determine how much life expectancy was gained due to reunification. Second, we describe the role of health care and pension spending in East Germany before and after reunification. Third, using the projected age-specific mortality rates, we calculate a difference-in-difference model in which we estimate the relative elasticity of mortality to public spending. Fourth, we refine our analysis by estimating the effect of pension and health care spending on eastern German mortality. We find some evidence that the significant investment in pensions and health care in the East facilitates convergence in mortality rates between the two regions and a gain in life expectancy. We find some indication that investments in health care in the East had a larger effect on mortality than pension payments. In addition, we find that pension payments also contributed to increase life expectancy to reach the West German level.

Life expectancy since the 1970s

The changing institutional arrangements in the East after reunification led to a steep increase in life expectancy among East Germans. Prior to reunification, the gap in life expectancy between East and West Germany was large and increasing. In 1970, the average life expectancy for women in the East and the West was about the same, at around 73.5 years; and the average life expectancy for men in the East was actually 0.8 years higher than the 67.3 years for men in the West. However, between 1970 and the fall of the Berlin Wall, the gap in life expectancy rose substantially, partly because of the inability of the East to keep up with West German spending on health care and pensions (Volpp, 1991; Mielck, 1991; Hockerts, 1994; Schmidt, 1999; Gjonça et al., 2000). This changed rapidly after reunification with the age groups above age 65 benefiting most. In the two decades following the reunification of the country, eastern Germans experienced marked increases in life expectancy. Between 1990 and 2009, women in the East added 6.3 years and men in the East added 7.4 years to their average life expectancies, compared with increases of just 3.5 years for women and 5.1 years for men in the West. Thus, the gap in life expectancy between the East and West narrowed from 2.7 years for women and 3.4 years for men in 1990, to 0.09 years for women and 1.2 years for men in 2011 (Human Mortality Database, 2013).

Fig. 1 shows the partial life expectancy below age 65[1] and the remaining life expectancy at age 65 in contrast to other central and eastern European countries that benefited from the Fall of the Iron Curtain. The purpose of this illustration is to show that the Czech Republic and East Germany prevented death at younger ages relatively well already before 1990. In contrast, remaining life expectancy at age 65 lagged significantly behind. Interestingly, while all countries witnessed increases after 1990, East Germany was the only region that converged to the West German level. This suggests that, apart from changing living standards, the massive transfers from West Germany helped to improve old-age survival more in East Germany than in other transformational countries. Fig. 1 suggests that the convergence of East German life expectancy resulted from mortality improvements among the ages above 60. This becomes more apparent if we decompose the improvements in life expectancy at birth (Arriaga, 1984).

Fig. 2 shows the contribution of different age groups to the gain in life expectancy since the Fall of the Berlin Wall. Mortality improvements among women in the age groups above age 60 were responsible for 75% of the increase in life expectancy at birth. Males in the same age groups contributed 64% on average per year since 1995.

This marked increase in life expectancy since reunification was accompanied by soaring public spending on social security and social infrastructure designed to eliminate the disparities between the West and the East.

Germany before reunification

East German social policy was geared toward enabling citizens to contribute to the productivity and prosperity of the socialist economic system (Schmidt, 1999). It was intended not only to increase (female) labor market participation, but also to minimize the risk that people would drop out of the labor market. Thus, East German policy was largely focused on current or future workers. The decline in fertility rates during the 1970s coupled with out-migration led to an increased emphasis on policies designed to maintain or even increase the East German labor force. Thus, the highest political and fiscal priorities of the East German government were developing family policies, providing occupational medicine, and creating special benefit programs for individuals who were deemed particularly valuable for the East German economy (Schmidt, 1999). Meanwhile, policy makers showed considerably less interest in older East Germans who had left the labor market (Mientus, 2006). At the beginning of the 1970s, the average East German pension income was only 26.1% of the average labor income (Schmidt, 1999). Whereas the status-preserving West German pension system granted beneficiaries 43% of their gross wages, which corresponded to a net replacement rate of 63% (EU Report 2006,), the East German system caused a majority of pensioners to spend their retirement in a precarious social and financial situation (Queisser, 1664). A voluntary supplemental pension scheme designed to alleviate this problem was established in 1971. In 1990, those retirees who had contributed to the scheme over the whole period were receiving 70 East German marks in addition to the average East German monthly pension of 380 East German marks (Meinhardt, 2000).

The social and political disregard for the elderly was also implicit in the availability of health care resources. Older East Germans suffered the most from the underfunded and technically outdated health care system. During the 1970s and 1980s, public investments in the health care system, 93% of which was owned by the state, declined to under 3% of state expenditures (GDR Statistical Yearbook 1990). In contrast, total health expenditures amounted to 9% in West Germany in 1985 (OECD, 2013). In 1990, it was estimated that East German health care technologies and pharmaceuticals were lagging 15 to 20 years behind Western standards (Mielck, 1991). At the same time, the shortage of medical personnel and the poorly maintained medical infrastructure led to an undersupply of health care (Busse and Riesberg, 2004). This failure to keep up with Western standards was reflected in the rise in the number of deaths from treatable causes, especially circulatory diseases (Nolte et al., 2002).

The reunification of Germany

Immediately after the Wall fell, large amounts of money started flowing from West to East. As part of the economic, social, and cur-

[1] The partial life expectancy at age 65 estimates how many years of life on average a newborn expects to live up to the age of 65.

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