

Macroeconomic Effects on Mortality: Issues, Controversies, and Directions for Research

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Abstract

This essay examines the development of ideas on the macroeconomic effects on mortality. It surveys some nineteenth century views, the early twentieth century contributions of Ogburn and Thomas, the 1970s–1980s debates of Brenner and Eyer, and the modern views, contributions, and controversies involving Ruhm and other authors who have tried to demonstrate the empirical support—or the lack of it—for the contentious hypothesis of the procyclical oscillation of mortality. That is the pattern, now clearly established for many, but unproved for more than a few skeptics, that once long-term trends are taken away, mortality oscillates with the business cycle, rising in expansions and declining in recessions. Potential sources of discrepancies, hypothesized or proven mechanisms for procyclical mortality, and related policy issues are discussed, and the essay concludes by suggesting five questions that future research should aim to answer.

To the memory of Joe Eyer, 1944–2017

INTRODUCTION

In 2000, Christopher Ruhm's article "Are recessions good for your health?" was published in the *Quarterly Journal of Economics*. Ruhm modeled mortality rates of the 50 states of the United States, using fixed effects to adjust for time trends and unobserved variables. He found higher unemployment associated with lower mortality for all causes and for the most important causes of death; that means that mortality is lower in recessions.¹

1. Because space restrictions, only a few selected references are included in the reference list of this essay. When controversies are cited, only the last article of the debate is referenced as a guide. A fully referenced version is available from the author on request.

Ruhm's paper was considered as a path-breaking work in economics. However, for quite a number of researchers in various fields Ruhm's results were puzzling. Epidemiologists and demographers had repeatedly found that mortality has a gradient by social class and ethnic group, so that those living on manual work, having lower income, or pertaining to marginalized groups have higher mortality. Furthermore, unemployed individuals had been repeatedly found having lower levels of health and higher risk of death. During recessions, incomes decrease and many become unemployed, so would it not be logical to expect as a consequence worse health and higher mortality? When research found the opposite, it generated puzzlement.

ANTECEDENTS OF PUZZLEMENT

In the first half of the nineteenth century, the ideas on population of Thomas Robert Malthus raised major controversies. Malthus attacked the views on social progress of William Godwin and the Marquis de Condorcet, who in today's parlance would be left-wing radicals. For Malthus, unavoidable scarcity due to population increasing faster than food would lead to repeated "checks" in which outbreaks of famine, epidemics, and war would reestablish the equilibrium between human numbers and food availability. In 1845, one of Malthus's critics, Friedrich Engels, claimed that it was not overpopulation but recurrent commercial crises that brought misery and were often linked to epidemics and general malaise. Twenty years later, Engels's friend and protégée Karl Marx reported in *Das Kapital* a quite different thing. Marx said, citing reports of medical inspectors, that health had improved among the workers in the English textile districts during the crisis of the 1860s, when cotton supplies had ceased arriving in England because of the U.S. Civil War. Many had become unemployed but, in general, health had improved during the crisis, as workers had ceased being exposed to the insalubrious environment of the factories, and mothers had now time to breastfeed their children and no money to buy them Geoffrey's Cordial—an opiate mixture which in those times was often administered to babies to keep them quiet.

It was, however, the notion of a link between economic crises, overpopulation, and excess mortality that took hold. Thus in 1898, in a study on commercial crises in England, Mijail Tugan-Baranovski concluded after a very superficial examination of the data that crises were associated with increased mortality. A much more careful study authored by William Ogburn and Dorothy Thomas three decades later, in 1922, showed exactly the opposite, a positive correlation of detrended annual series of business indicators and the mortality rate, which proved that economic depressions were associated with lower mortality. Ogburn and Thomas were puzzled by this finding, but after much

consideration and further study they thought it was real, as they found it both in U.S. and British data.

MORTALITY AND THE BUSINESS CYCLE

The oscillations of economic activity between boom and bust, prosperity and depression, or expansion and recession have been called business cycles, trade cycles, industrial cycles, and crisis cycles, but such abundance of terminology goes along with the inability of the economic profession to agree on the causes of the phenomenon. In the 1860s, Clément Juglar in *Les Crises commerciales et leur retour périodique en France, en Angleterre, et aux Etats-Unis* and Karl Marx in *Das Kapital* theorized on the cause of crises. Both attributed crises to the inner workings of the free-market system, but their contributions had little resonance among economists who were paying more attention to outstanding members of the profession like W. S. Jevons and H. L. Moore, who attributed crises to influences of the Sun or the planet Venus. It took a while for these astral theories to go away, despite that they were clearly at odds with the facts. In 1920, an economist-geographer, Ellsworth Huntington, proposed that recessions are due to unidentified biological factors that generate peaks in mortality and impact on the spending and investing psychology of the public. Huntington was noticing the same correlation between death rates and macroeconomic conditions that Ogburn and Thomas would notice later, but he was looking for causality in the opposite direction, that is, from mortality to the economy.

In the 1930s, the world sank in depression and joblessness increased rapidly. In *Cycles and crisis*, published in 1936, the German economist Wilhelm Roepke wrote that the general contraction of economic activity of the depression was associated with dismissed workmen, closed workshops, rusting machines, and the human tragedies bound up with them, including a rise in death rates. But, alas, he was totally wrong about this, as actually mortality had decreased, puzzling public health workers (Tapia Granados & Diez Roux, 2009). It had been in the expansionary twenties that mortality had stagnated or increased (Figure 1). However, at the time all this was barely registered.

After the depression and the war passed, new data now available made obvious that mortality was secularly declining in many countries. In 1958, a leading demographer and economist, George Stolnitz, claimed that disease control, that is, advances in medicine and health care, had been the most influential factor for mortality reduction. This was the typical view in the 1950s and 1960s, though the long-term decline in mortality was also thought to be influenced by economic growth. Interestingly, in the United States, the 1950s and 1960s were economically prosperous but mortality declined at

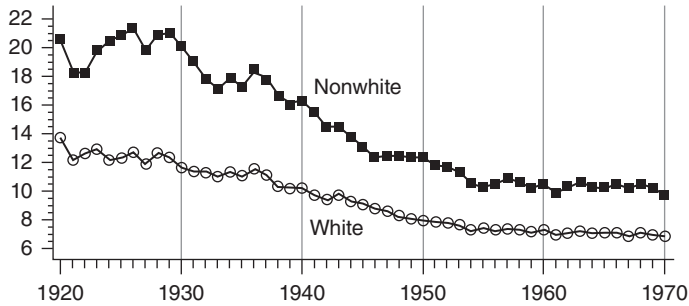


Figure 1 Age-adjusted mortality (per 100,000 population) for whites and nonwhites in the U.S. civilian population, 1920–1970. *Source:* Historical Statistics of the United States.

a much lower rate than in the 1930s and 1940s (Figure 1). The short-term negative association between economic growth and mortality that Ogburn and Thomas had discovered in the 1920s had been totally forgotten.

It was rediscovered in 1977 by a biologist at the University of Pennsylvania, Joe Eyer. By inspecting U.S. graphs of mortality and unemployment for 1870–1975, Eyer noticed that they evolved mirroring each other, so that peaks in one series coincided with troughs in the other.

Eyer knew the 1920s publications by Dorothy Thomas and proposed several hypotheses to explain what he called *the Thomas effect*, that is, the rise of mortality during economic expansions. He attributed it to higher levels of stress at work, increasing overtime, overwork, and migration, and the subsequent decline in networks of social support and increase in the consumption of harmful substances.

It was also during the 1970s that Thomas McKeown, a British historian of medicine, published a series of analyses of population data. McKeown's basic conclusion was that population growth since the late eighteenth century was mostly due to a drop in death rates caused by rising standards of living. The basic mechanism would be a higher level of resistance to infection due to an improvement in nutrition. For McKeown, better hygiene, public health measures, and improved medicine had had only a limited role in the historical decline of mortality. Though McKeown's contributions referred to long-term processes, and to the already gone time when most deaths were due to infectious disease, they probably created a fertile ground for the ideas of Harvey Brenner.

Brenner's basic claim was that recessions raise mortality rates, though the effect occurs, he said, with a lag. Brenner was very unclear about this lag, stating in some papers it is just a few years, in others that it is 10 years, or even more. Given that recessions recur at variable periods—few years or sometimes even more than a decade—this lagged effect cannot

explain that troughs of mortality coincide with recessions, that is, with peaks of unemployment. Brenner used econometric methods very obscurely explained, and probably many readers, including reviewers, did not understand them. There were, however, researchers, starting with Eyer, who did not buy Brenner's main idea, that is, his "demonstration" of recessions raising mortality with a lag. Brenner's work was criticized as confusing and irreproducible, but Brenner never answered his critics. All this was later summarized as leading to considerable skepticism about Brenner's data and conclusions (Kasl & Jones, 2000).

PROCYCLICAL MORTALITY AS A CONTENTIOUS HYPOTHESIS

Since 2000, when Ruhm's paper appeared, researchers from various fields of social science have found in different countries and periods that over and above long-term trends, mortality oscillates procyclically, that is, increasing during expansions and decreasing during recessions—more than 30 of these publications are cited elsewhere (Tapia Granados & Ionides, 2017). However, incredulity persists among researchers who are reluctant to believe that recessions with the associated joblessness and loss of income are *not harmful* for health and survival.

One of these investigators, Ralph Catalano, tested in a 1998 study the effect of macroeconomic changes on mortality. As a kind of control, Catalano included Danish data as a covariate in his models for the United States, an unconventional method that no one has tried later. Catalano concluded that mortality declined in years following increases in per capita national income above long-term trend, that is, that expansions reduce mortality with a lag. This is Brenner's thesis with other words. However, Catalano seems to have changed his views, as in recent controversies on the mortality effects of the Great Depression (Bruckner, Noymer, & Catalano, 2013) and the Great Recession (Tapia Granados & Ionides, 2016) he defended the view that neither of them had any significant positive or negative effect on mortality. In passing, it has to be said that maintaining that recession has no effect on mortality while expansion stimulates its decline would not be admissible on logical grounds.

In another controversy on the Great Depression, David Stuckler, Sanjai Basu, and others argued that the only mortality effect of it was, as that of other recessions, to raise suicides and reduce traffic fatalities, without any detectable effect on major causes of death (Tapia Granados, 2013a). These researchers reached this conclusion from investigating 1970–2007 data from 26 EU countries. This was a study that unfortunately conflated data from two very different scenarios: the sustained decline of mortality rates—which indeed accelerated slightly during recessions—during

the 1980s and 1990s in Western Europe, and the demographic disaster in Eastern Europe during the 1990s, when major increases in mortality occurred during the crisis transition to a market economy. Because of the heterogeneity of the data, the study conclusions are hopelessly unreliable.

It were also Stuckler and Basu, who in a book melodramatically entitled *The Body Economic—Why Austerity Kills*, argued that during economic crises government policies determine whether mortality will increase or decline. Such an optimistic view on the ability of government policy to modify quickly a demographic variable as complex as mortality was a flawed diagnosis (Tapia Granados, 2013b). It was demonstrated so by the fact that since 2008 mortality has significantly declined in Europe, particularly in Greece and Spain where both the severity of the recession and the application of austerity policies have been outstanding (Regidor *et al.*, 2016; Tapia Granados & Ionides, 2017; Tapia Granados & Rodriguez, 2015).

Further controversies on similar issues have occurred (Tapia Granados, 2014), and everything suggests that they will continue, as the sources of these debates are well-rooted ideas. Doubtlessly, different investigators would give different answers to the question of what specific misunderstandings or erroneous ideas underlie these arguments. From the point of view of the present writer, who is an interested party, two deep-rooted beliefs are the basis of the visceral rejection of the hypothesis of procyclical mortality by quite a number of investigators: first is the belief that a growing market economy is good for everyone, something that economists have preached since Adam Smith; second is the view that the level of income is *the* major determinant of the probability of death, something that can be erroneously inferred from modern public health research, which rather has shown that working and living conditions and the social context—including what epidemiologists call “social support,” —are key determinants of the risk of death.

Looking at more superficial reasons for discrepancies, it is obvious that sometimes they refer to misunderstandings on the analysis of time series (Tapia Granados & Ionides, 2016), the nature of the business cycle, or the relation between causal structures and regression analysis. Thus in an investigation testing whether economic fluctuations have an impact on mortality, such variables as traffic volume and tobacco consumption were included in a multivariate regression with the death rate as dependent variable (Economou, Nikolaou, & Theodossiou, 2008). Since expansions can be harmful precisely because they involve increased traffic and tobacco consumption, this is a perfect recipe for obtaining spurious results.

Complicating research on these issues and fueling skepticism is the fact that methods to ascertain causal links between time-series variables have often

raised controversy in social sciences, particularly in macroeconomics, where major disagreements exist.

In early investigations of macroeconomic effects on health, the unit of analysis was usually a whole nation, with the analysis reduced to a bivariate analysis of time-series data. But most time series of economic indicators and health variables are annual, and this usually means series that rarely go beyond a hundred observations, and usually much shorter. Panel analyses with disaggregated data for smaller geographical units have greater statistical power, but they raise two issues: what is the proper level of aggregation (Lindo, 2015) and the violation of the assumptions of linear regression which is caused by the use of linear trends and can bias the results (Ionides, Wang, & Tapia Granados, 2013).

In 2015, Ruhm analyzed U.S. national-, state-, and county-level data 1976–2013 to investigate whether economic crises affect mortality “in the same way as less severe downturns.” He concluded that the answer is yes, so that both recessions and crises reduce death rates, with crises having an effect on mortality that is about twice as strong as what would be expected due to the elevated unemployment rates alone. In the operational definition of economic crisis of this study, a crisis is just a severe recession as indexed by unemployment reaching more or less arbitrarily determined “high levels.” Ruhm admitted that this definition is arguable. For Wesley Mitchell, the pioneer in business-cycle research, in the context of market economies, “crisis,” “depression,” and “recession” are terms that refer basically to the same phenomenon; they only suggest different intensities of it. On the other hand, the famines that occurred in the USSR in 1932–1933, or in the Netherlands or India during World War II, or the extreme economic disruption that occurred in Eastern Europe in the 1990s are also “economic crises,” in all of which there were substantial increases in mortality. However, these are economic crises of a very different nature to the recessions or depressions of, say, the early 1980s or the last years of the past decade, which appeared under “normal” social life in settled market economies. In all these cases, mortality continued its secular decline, and dropped even faster.

A new example of the proneness of quite a number of researchers to look for reasons to deny the procyclical oscillation of mortality is a recent paper by Arthi *et al.* (2017) who propose a “migration bias” as the cause of the “observed” procyclical oscillation of mortality. This oscillation would actually be a statistical artifact. According to Arthi *et al.* (2017) selective migration—toward booming regions and away from depressed areas—bias the denominator of mortality rates causing mortality to seemingly oscillate procyclically, when in reality it does not oscillate, or even oscillates countercyclically. The reasoning of the paper is tortuous, and its results are at odds with many studies showing a procyclical oscillation of mortality using

national data (for instance in the USA, UK, Sweden, and Japan). But for sure it will find a receptive audience.

POLICY ISSUES

Leading economists like Paul Samuelson, Milton Friedman, or Robert Lucas claimed at different times the ability of economic policy guided by macroeconomic principles to prevent major oscillations of economic activity. However, the interventionist or *laissez faire* policies these authors advocated were remarkably different. Indeed, the major economic downturns observed around the turn of the century in most of the developing world and in 2008 in the global economy suggest that governments are rather unable to prevent them. Furthermore, economists are seriously divided on what is to be done to prevent or ameliorate recessions.

In spite of all that, some health researchers are convinced that it is government policy that determines whether an economic crisis will have or not harmful effects on mortality. The idea is far from being demonstrated; indeed, as has been argued here, the weight of evidence favors the view that mortality oscillates procyclically, so that recessions stimulate the decline of mortality independently of government policy.

Ruhm, who is arguably the contemporary researcher who has contributed more to the view that expansions have harmful effects on mortality, has claimed that contractionary macroeconomic policies are not justified, as recessions “have overwhelmingly negative consequences, even if they do not harm physical health.” Obviously, the negative consequences meant by Ruhm are the business failures and the destruction of jobs that characterize recessions and trigger social distress. But what about policies intended to prevent the harmful effects of expansion? Ruhm has suggested establishing economic incentives to reduce unhealthy behaviors, and to promote healthier conditions of work—with reductions in overtime and mandatory expansion of vacation time. Policies to reduce unhealthy consumption have been indeed implemented in some countries, though almost exclusively for alcohol and tobacco products. Interestingly, in the field of public health, similar policies applied to the consumption of fossil fuel have been recommended not only to prevent climate change but also as potentially having major effects in reducing traffic mortality, cardiovascular and respiratory diseases, and many other causes of death. However, as illustrated by recent political developments on climate change, in the short run the implementation of such policies is very unlikely in any country, as they encroach on business profits and therefore are strongly opposed by the business community.

Given disagreements inside economics on the effect of policies, the not uncommon skepticism on the procyclical oscillation of mortality among health researchers, as well as the scarce political feasibility of specific policies to dampen the oscillation of mortality during expansions, to reach any consensus to recommend this kind of policies seems very unlikely in the near future. Thus, trying to develop theoretical foundations for such policies does not look at all a fertile ground for work.

FIVE QUESTIONS THAT FUTURE RESEARCH SHOULD AIM TO ANSWER

The starting point here is considering the procyclical oscillation of mortality as a hypothesis supported by substantial evidence. For researchers who are skeptical about it, what follows will probably make little sense.

1. What is the Connection Between the Epidemics of Prescription Drug Poisoning, Other Iatrogenic Deaths, and the Business Cycle?

In the United States, the highly publicized epidemic of fatalities caused by poisoning with prescription drugs seems to have grown with the recession, that is, countercyclically (Ruhm, 2015). This epidemic of deaths caused by prescribed medicines has obviously links with the larger chapter of medical errors, estimated as the third leading cause of death in the United States (Makary & Daniel, 2016). Now, all this raises the issue whether business-cycle-related changes in the level of access or intensity of medical care might be connected with procyclical mortality. According to reports of the Centers for Disease Control (CDC), the overall U.S. death rate increased in 2015 for the first time in a decade, exactly at the same time that Obamacare was expanding access to health services. This is of course only one data point, but it raises major questions.

2. Is Mortality Becoming Less Procyclical?

The procyclical oscillation of mortality might be disappearing because dampening by the increasing weight in mortality of fatalities which are either countercyclical (e.g., analgesic overdoses) or acyclical (cancer). Versus this view, recent studies rather suggest the opposite. Lindo, in a study with U.S. county data which provides important methodological insights has found an intense procyclical oscillation of mortality and has rejected the view that mortality would be becoming less procyclical (Lindo, 2015). Furthermore, in a number of studies, increased unemployment rates in recent times (e.g., in U.S. states or EU nations) have been found associated with

large drops in mortality, which reinforce the hypothesis of procyclicality of the death rate. At any rate, studies formally testing the hypotheses of procyclical mortality and its potential dampening in recent times would contribute to improve our understanding of these issues. China and India are two countries in which testing these hypothesis would be particularly valuable.

3. What are the Major Mechanisms for Procyclical Mortality?

Advances in understanding the mechanisms for procyclical mortality have occurred. From an analysis of U.S. data, it has been concluded that about a third of procyclical mortality is attributable to variations in atmospheric pollution (Heutel & Ruhm, 2013). On the other hand, evidence that procyclical mortality due to injuries is connected with the procyclical oscillation of industrial and recreational traffic as well as workplace activity and hiring has continued piling up (Asfaw, Pana-Cryan, & Rosa, 2011; French & Gumus, 2014). Proposed connections between procyclical mortality and changes in staffing of institutions for the elderly were suggested, but have been seen with skepticism. A study using European data showed shorter working hours associated with higher mortality (Johansson, 2004), a result that seems to contradict the old idea that lower mortality in recessions may be linked to the procyclical character of working time, overtime, and work-related stress. However, this was just an isolated study, and indeed institutional factors may modify the business-cycle character of hours worked, which may measure different things in different countries. At any rate, the potential relation of work hours, overtime, stress levels in the working environment, and connected issues with the oscillation of mortality seems a largely unexplored field worthy of investigation.

A still unpublished study has investigated the association of economic conditions in the area of residence with the level of risk factors for cardiovascular disease in a sample of residents, finding that systolic and diastolic blood pressure rise and physical activity drops during expansions. These can be important findings opening major avenues for future research.

4. Who is Hurt, Who Benefits from Procyclical Mortality?

A recent study demonstrated that mortality decline significantly accelerated in Spain during the recession that started in 2008 (Regidor *et al.*, 2016). Mortality was found to be the highest in the group of low socioeconomic status (SES) and the lowest in the group of high SES. The annual reduction in mortality during the recession years 2008–2011 was almost without exception in each SES group greater than the reduction in 2004–2007, that is, during

the previous expansion. Furthermore, the acceleration of mortality decline during the recession was intense in the group of low SES, but very small in the group of high SES. The conclusion was that mortality decline accelerated during the recession, particularly in the group of low SES and, likely as a consequence of drops in the exposure to risk factors, probably more important for individuals of low SES.

It seems that groups of lower SES benefit the most from the acceleration of mortality decline during recessions. In the United States during the early 1930s, mortality dropped in whites and nonwhites and males and females, but it dropped the most in African-American men (Tapia Granados & Diez Roux, 2009). The mortality gap between whites and nonwhites had clearly widened in the “roaring” 1920s, then narrowed in the depressed 1930s (Figure 1). In Finland, in the severe recession of the early 1990s, mortality declined the most among households obtaining income from manual occupations (Tapia Granados, 2007). In Japan, stagnation during the 1990s was associated with dramatic changes in occupational patterns of mortality, as the health of managers and professionals deteriorated while that of sales staff and blue collar workers did not, all of which led to a major reduction or even reversal of the usual patterns of health inequality (Wada *et al.*, 2012). In all these studies, low SES groups benefit more from the reduction in mortality during recessions, so that health inequality tend to diminish. If that is the case, not only mortality but mortality inequalities would be procyclical. A study with U.S. data (Edwards, 2008) seems at present the only investigation perhaps inconsistent with the hypothesis that mortality inequalities by SES are procyclical.

5. Is Economic Growth Presently Hindering Health Progress?

This is probably the most important question connected with the hypothesis of procyclical mortality. It is a key question because economic growth as a panacea for all social ills is an entrenched idea in our culture. So much so that that two authors, Suchit Arora and R. F. Swift, “demonstrated” in the past the cointegration between the level of health, as measured by life expectancy at birth (LEB), and the level of income, as measured by GDP per capita. This cointegration was also one of the “contributions” of Harvey Brenner.

Cointegration between LEB and income per capita means that in the long run each variable will follow the path of the other, so that higher levels of health will be obtained by raising levels of income. Versus that idea, supposedly proved by tortuous econometrics by Arora and Swift, what recent studies on the long-term evolution of mortality have shown is that, if there was a positive link between economic growth and population health, that link has disappeared in recent decades (Cutler, Deaton, & Lleras-Muney, 2006;

Preston, 2007). This is an idea that still provokes the suspicion and rejection of those who more or less enthusiastically defend the thesis of “wealthier is healthier” (Mackenbach, 2007).

The hypothesis of procyclical mortality is also counterintuitive because it suggests that economic growth is harmful for health, while economic stagnation or contraction is beneficial. Thus an epidemiologist mocked once the hypothesis of procyclical mortality by asking whether public health people should advocate recessions. But, should they?

Let start from assuming that we agree that mortality is procyclical, so that it deviates from a long-term declining trend upward in the expansions and downward in the recessions. Now, this oscillation can be considered as having no net effect on the long-term evolution of mortality, as the excess mortality during the expansion may be compensated by lower mortality during the recession. Then, in the long run, wider or flatter macroeconomic oscillations would make no difference in the evolution of mortality. But in most business cycles, the expansion is longer than the recession, and therefore the above-trend mortality of the expansion would not be compensated by the below-trend mortality during the recession. If that is the case, longer or faster expansions would mean a longer accumulation of over-trend mortality; that is, faster or more maintained GDP growth would cause slowly increasing or even decreasing LEB, while longer or deeper recessions would mean longer accumulation of below-trend mortality, that is, faster increase of LEB. Quite substantial evidence seems to support this hypothesis.

With one of the oldest and best demographic statistics of the world, Sweden has been the object of many demographic studies and controversies. Using Swedish data, Edward Ionides and I showed in 2008 that in the past two centuries there was a reversal of the relation between economic growth and health progress. Throughout the nineteenth century GDP growth was positively associated with the annual decline in mortality, or the gain in LEB, but the relation became weaker as time passed and was completely reversed in the second half of the twentieth century, when economic growth appears inversely associated with health progress, with higher annual GDP growth implying lower annual reductions in mortality, or gains in LEB. This paper, like those by Arora and Swift, have been basically unnoticed by health researchers. Unfortunately, published research is often ignored rather than replicated or refuted, which does not contribute to scientific progress.

While the hypothesis that economic growth has become a hinder for health progress is clearly supported by the case of Sweden, additional “circumstantial evidence” is abundant from other countries and periods. Thus in the UK, Amartya Sen showed an inverse relation between the decennial rate of GDP growth in the period 1900–1960 and the decennial increase of

LEB in England and Wales (Sen, 2001), a finding that was later replicated for a larger timeframe of almost two centuries. In the United States, the decades prior to the Civil War of the 1860s saw rapid economic growth at the same time that the stature of native-born white males dropped, revealing a deterioration of population health (Haines, Craig, & Weiss, 2003). Then, in the twentieth century, during the “roaring” 1920s, mortality stagnated or increased, while in the depressed 1930s it quickly dropped, and during the “prosperous” 1950s and 1960s it basically stagnated (Figure 1). In the two most populous nations of the world, China and India, the past half century saw quick mortality decline in the decades of economic stagnation and slow mortality decline when economic growth accelerated (Cutler *et al.*, 2006). The relation seems to be observed also in African countries, where high GDP growth has been associated with poor improvements in infant mortality and other health indicators in recent decades. Thus Botswana and South Africa had much higher GDP growth and much smaller reductions in mortality than Morocco and Ethiopia.

According to World Bank data, in 2014 Japan was the nation with the highest LEB (83.6 years), followed by Spain, with the highest LEB in Europe (83.1 years). Now, the remarkable thing is that these two countries have had a very poor economic performance in recent decades, with Japan basically in chronic stagnation since the 1990s and Spain suffering the worst recessions and the highest levels of unemployment in Europe since the early 1980s. The recent Great Recession has been associated with major gains in LEB in Spain, Greece, and the Baltic States, that is, the economies where the recession was the most severe. Contrarily, among the high-income countries of the OECD, the United States and Denmark have been often considered as perhaps the most efficient economies in term of flexible and well-performing labor markets which allow more sustained GDP growth and less unemployment. At the same time, though, both countries are the OECD laggards in terms of population health.

The common view that business prosperity and GDP growth are what we need to solve social problems seems at odds with the aforementioned facts, but it is also questioned by something more important, the fact that faster GDP growth means both at the level of national economies and the global economy, greater emissions of CO₂ (Tapia Granados, Ionides, & Carpintero, 2012) and thus a faster approximation toward what could be the worst human-made catastrophe in history. Of course, advocates of zero growth usually ignore the obvious fact that in our economic system no growth represents rising unemployment rates and social malaise. But those who are enthusiastic about economic growth are very often oblivious to the harmful consequences of it.

The function of social science, Joan Robinson once said, “is quite different from that of the natural sciences—it is to provide society with an organ of self-consciousness.” Let us hope that humanity may generate a sufficient level of self-consciousness before it goes down into a man-made black hole. Perhaps research on the macroeconomic effects on health can contribute something to that endeavor.

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