



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DISEI

DIPARTIMENTO DI SCIENZE
PER L'ECONOMIA E L'IMPRESA

WORKING PAPERS - ECONOMICS

A theory of why potentially favourable political and economic changes may lead to mortality crises

GIOVANNI ANDREA CORNIA

WORKING PAPER N. 23/2019

*DISEI, Università degli Studi di Firenze
Via delle Pandette 9, 50127 Firenze (Italia) www.disei.unifi.it*

The findings, interpretations, and conclusions expressed in the working paper series are those of the authors alone. They do not represent the view of Dipartimento di Scienze per l'Economia e l'Impresa

'This paper has been produced for the project '**Mortality and life expectancy in post-communist countries**' sponsored by the Research Institute Dialogue of Civilizations (DOC RI) based in Berlin, The paper can be retrieved from the [DOC RI website](#)'.

A theory of why potentially favourable political and economic changes may lead to mortality crises^{1, 2}

by
Giovanni Andrea Cornia
University of Florence – final version

Summary and motivation of the study. Potentially positive systemic economic and political changes may entail large transitional health costs. These have often been underestimated *ex-ante* and are often neglected *ex-post* by incumbent governments. With the aim of drawing lessons for future transformations and the action of policy makers, the paper reviews six past and current episodes of political, economic and social transformation that were expected to generate greater political freedom, economic prosperity and individual wellbeing, but that instead generated substantial increases in death rates, particularly among low-income groups. The paper suggests that the frequency of such type of crises might increase in the future owing to the current acceleration of economic, social, demographic and technological change.

The paper presents a taxonomy of causal factors behind the mortality crises that followed potentially positive political and economic reforms expected to move a country from a low social equilibrium to a higher one. The taxonomy of factors responsible for the discrepancy between *ex-ante* expectations and *ex-post* outcomes includes the unexpected effects of rural-urban migration combined with an inelastic supply of public infrastructure; political reforms carried out in the absence of adequate administrative, legal and redistributive institutions; the introduction of economic reforms under conditions of incomplete or distorted markets and institutions; and the unchecked contact between socio-economic groups characterized by different disease profiles. The impact of the lack of democratic institutions is also explored when data allow.

Particular attention is placed on the transition to the market economy and liberal democracy of the former European communist countries. Between 1990 and 2014, the transition generated aggregate excess deaths of 17 million, of which only a modest part was due to population aging. Despite its magnitude and a growing number of studies, the transition mortality crisis has attracted limited attention by national authorities and international agencies. When it was acknowledged, it was often attributed to past shocks or irrelevant factors retarding in his way the introduction of an adequate policy response. Thus, unless actively managed by incumbent governments, the transition from a low to a high socio-economic equilibrium may generate large health and social costs.

¹ The author would like to thank Luca Bortolotti and Bruno Martorano for helping with the data compilation and analysis, as well Matti Pohyola, Vladimir Popov and Vladimir Schkolnikov for sharing reaserch in this field or providing comments on an initial version of this paper. The usual caveats apply.

² Section 2 of this paper draw in part on Cornia (2004) and Cornia and Paniccia (2000).

1. Introduction: is systemic political and economic change intensifying?

The last three decades have been characterized by rapid change in the political, demographic, technological and economic areas. Far from witnessing ‘the end of history’ predicted by Frances Fukuyama, the last thirty years have seen an acceleration of change in many areas.

To start with, since the early 1980s there has been a major paradigmatic shift towards the liberalisation of domestic and international markets and the globalisation of the world economy. This shift has taken place through a near universal application of structural adjustment programs that limited the role of the state in the economy, privatised state assets and liberalized labour and product markets in most developed and developing countries and, since 1989, in the former socialist economies. While in China and Vietnam, transition reforms were implemented in a gradualist fashion, in the former Soviet Bloc they were carried out in an accelerated fashion that simultaneously entailed a swift redefinition of national borders, the introduction of new political institutions, a radical reorientation of the economy and the adaptation of a disoriented population to a previously unknown way of life. Considerable, if less dramatic, liberalisation was introduced also in the labour markets of advanced economies such as Japan, South Korea and Italy that, as a result of these policies, experienced greater employment informalisation and instability, faster job turnover, longer search times and a shorter duration of each employment spell. Second, the last decade witnessed also a rapid globalisation of the world economy and, in particular, an explosion of cross-border trade and financial transactions (Table 1).

Table 1. Trends in domestic financial liberalization and capital account openness, 1982–2010

<i>Region</i>	<i>1982–90</i>	<i>1991–7</i>	<i>1998–2002</i>	<i>2002–10</i>
<i>Index of domestic financial liberalization</i>				
South America	5.1	6.8	6.9	7.7
Central America and Mexico	6.7	7.3	7.5	8.4
Sub-Saharan Africa	4.5	5.1	6.6	7.4
Middle East and North Africa	3.6	4.6	5.8	6.5
South Asia	4.7	5.6	6.4	7.4
East and South East Asia	5.9	6.9	6.6	8.2
China and Vietnam	0.0	2.9	4.6	8.0
Eastern Europe and Central Asia	0.5	3.2	7.4	8.7
Advanced economies	7.6	8.2	8.6	8.8
<i>Kaopen index of capital account openness</i>				
South America	-0.78	-0.17	0.76	1.00
Central America and Mexico	-0.84	0.29	1.18	1.67
Sub-Saharan Africa	-0.91	-0.82	-0.59	-0.56
Middle East and North Africa	-0.64	-0.35	0.02	0.36
South Asia	-1.29	-0.74	-0.93	-0.90
East and South East Asia	0.85	0.96	0.50	0.57
China and Vietnam	-1.73	-1.31	-1.07	-1.00
Eastern Europe and Central Asia	-1.84	-0.53	0.01	0.65
Advanced economies	0.83	1.89	2.28	2.32

Source: own compilation on the basis of the 2011 version of the Economic Freedom Dataset of the Frazer Institute (<https://www.fraserinstitute.org/economic-freedom/dataset>) and of The Chinn and Ito Index, that is a *de jure* measure of financial liberalization’ http://web.pdx.edu/~ito/Chinn-Ito_website.htm (2011 version). *Note:* The index of domestic financial liberalization ranges between 0 and 10 (complete liberalization). The Kaopen index ranges between -2.5 (closed capital account) and 2.5 (completely open capital account).

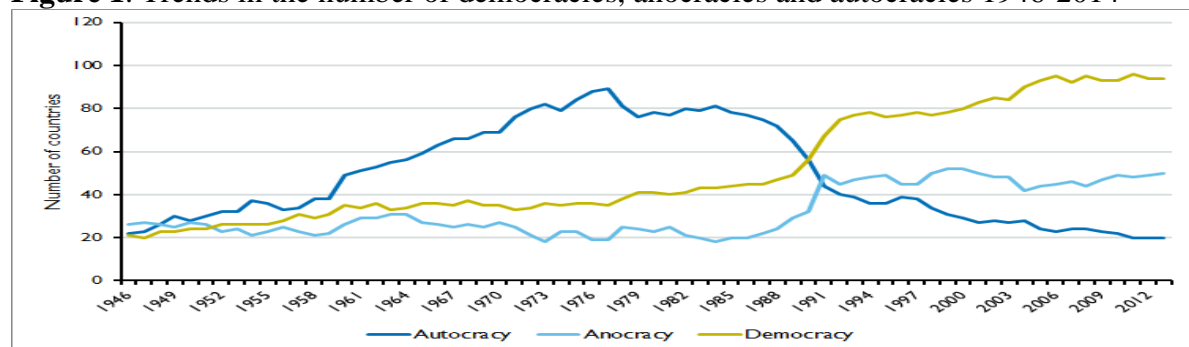
Overall, these changes seem to have generated not only some efficiency gains but also growing instability as shown by the rise in the number of currency, stock market and banking crises which have had devastating effects on the world economy. After the 2007-8 Lehman's crisis and the 2011 European Sovereign Debt crisis the drive towards capital account liberalization has slowed down (Table1).

Second, the last three decades recorded fast progress and extensive investments in the field of information and communication technology (ICT), biotechnology and pharmacology. The price of a memory chip fell 1200 times between 1975 and 1990 alone (Pohjola 2001) while (even leaving aside the controversial GMOs) progress in biotechnology raised farm yields in several developed and developing countries. At the same time, since about 2005 productivity growth has declined in all OECD countries. This is a bit of a mystery in view of the large investments in ITC mentioned above. This might have been due to the fact that R&D has diminishing returns or that it just takes time for productivity growth to pick up again as it did after the ICT revolution of the 1990s. Meanwhile, the deciphering of the DNA allowed developing a new range of 'target drugs' that enhanced perceptibly the treatment of previously incurable diseases. Finally, the introduction of digitalization generated productivity gains but also generated in many countries and sectors (such as banking, insurance and general administration) a huge substitution of labour with capital.

Similar or more marked effects may be generated in the years ahead by robotization and Artificial Intelligence (AI). Robots have not yet had a big impact but the channels through which they will enhance productivity are well known (Aghion, Jones and Jones 2017). Nanotechnology and robotization could one-day lead to the complete automation of manufacturing, while AI may do the same for many services. Indeed, AI seems to be poised to automate many tasks once thought to be out of its reach. It is not clear how this will affect growth, employment, the distribution of income, and wellbeing, as many tasks will succumb to automation. Only non-routine tasks requiring high levels of skills and lab-based research performed by highly skilled workers may survive. In the extreme case, AI will generate itself innovations without the help of even skilled workers. While, most of these changes had, and may have in the future, favourable long-term effects on growth, well-being and longevity, their short-term effects are far from clear. For instance, progress in the field of information and telecommunication eliminated millions of jobs and exported many more from the developed to the developing countries. It is likely that future changes in these areas will entail a large inter-country an intersectoral reallocation of labour that - if not properly managed - may raise personal stress and political turmoil.

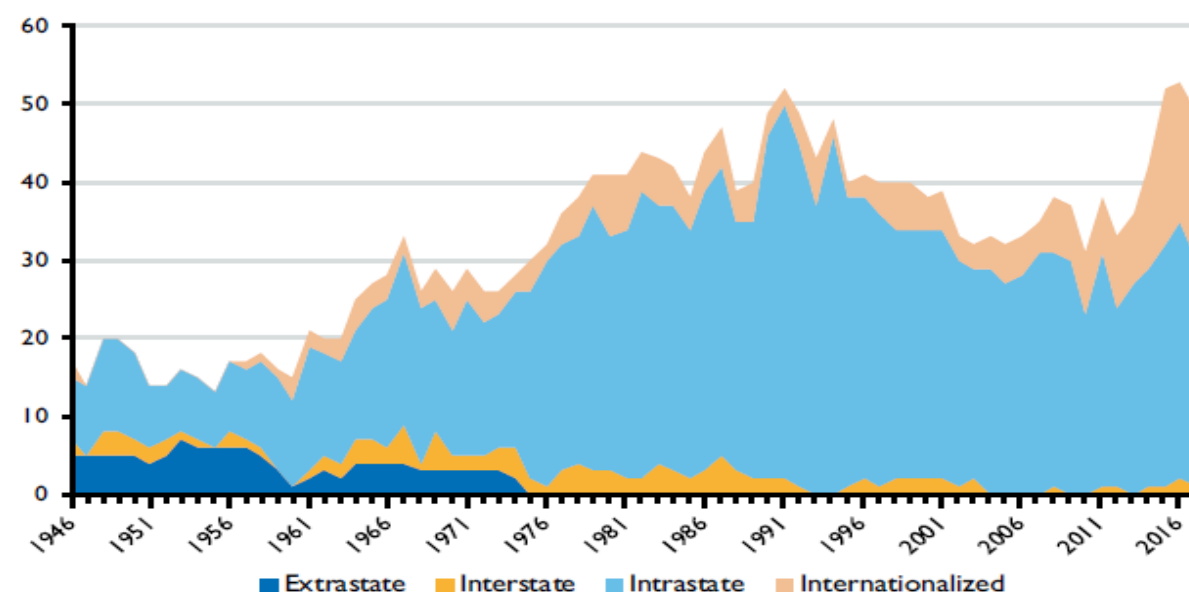
Third, the political systems witnessed rapid change too. Following the downfall of Soviet-type communism in Europe and Asia, the number of countries embracing different types of political democracy literally skyrocketed. Gone are therefore in many cases the systems based on authoritarian regimes, military dictatorships and neo-colonial institutions. These favourable political transitions were however at times accompanied by a surge in other forms of social instability, as vividly illustrated by a rise in crime rates in Russia and South Africa and – more worryingly – in the number of local conflicts and humanitarian crises (Figures 1 and 2).

Figure 1. Trends in the number of democracies, anocracies and autocracies 1946-2014



Source: Dupuy, K. and S.A. Rustad (2018) based on the Freedom House Index

Figure 2. Trends in the number of conflicts by type, 1946-2016



Source: Dupuy, K. and S.A. Rustad (2018)

Finally, demography has also been and will be a source of important change. While population growth declined in Europe, much of Latin America and China it continued increasing at a rapid rate in Africa, the Middle East and parts of South Asia.

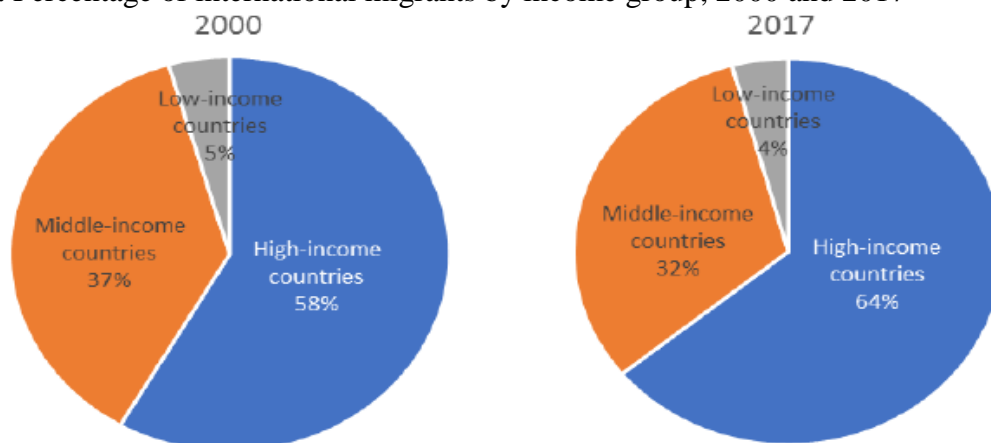
Table 2. Annual percentage rate of natural population growth by main region and countries

	1950-5	1960-5	1970-5	1980-5	1990-5	2000-05	2010-15
World	1.77	1.92	1.96	1.78	1.54	1.24	1.18
Developed	1.18	1.03	0.65	0.47	0.23	0.07	0.10
Developing	2.04	2.29	2.43	2.18	1.89	1.52	1.40
S.S. Africa	2.19	2.51	2.72	2.89	2.62	2.49	2.60
Asia, of which	1.91	2.11	2.30	1.97	1.68	1.24	1.04
- China	1.91	1.87	2.29	1.48	1.24	0.59	0.54
- India	1.68	2.04	2.23	2.28	1.99	1.69	1.30
L. America	2.71	2.87	2.58	2.30	1.87	1.56	1.19
Europe	1.03	0.94	0.54	0.35	0.03	-0.16	-0.03
N. America	1.51	1.31	0.64	0.67	0.68	0.54	0.43
Oceania	1.51	1.56	1.47	1.24	1.20	1.07	1.04

Source: Own compilation based on United Nations Population Division (2015 and 2017)

Such demographic imbalances, the persistence of a large number of intrastate conflicts often linked to ‘democratic revolutions’ (Figure 2) as well as the reduced cost of information and migration, have fuelled sustained South-North and South-South legal migration, as well as a surge in the number of asylum seekers and irregular migrants. As noted by a study by UN-DESA (2017), the number of international migrants worldwide has continued to increase since 2000, reaching 258 million in 2017, up from 220 million in 2010, and 173 million in 2000. This implies that while over 2000 and 2005, the international migrant stock grew by an average of 2 per cent per year, such rate has risen to 2.9 percent over 2005-2010. In view of the high population growth projected for the future decades in the low income South Asian, Central America and, especially, Sub-Saharan African countries (Table 2), and of the limited job creation prospects in several of the countries of outmigration, it is likely that the pressure to emigrate to high income countries will increase. In 2017, for instance, high-income countries hosted 64 per cent of all international migrants worldwide - equal to 165 million international migrants while 92 million migrants lived in middle- or low-income countries. In comparison to 2000, the share of international migrants living in high income countries increased slightly (Figure 3).

Figure 3. Percentage of international migrants by income group, 2000 and 2017



Source: UN-DESA (2017)

Indeed, high-income countries have absorbed most of the recent growth in global population of international migrants, absorbing 64 of the 85 million migrants added worldwide between 2000 and 2017. As a result, in the high-income countries the rate of growth of the migrant population rose during 2000-2017 to the 2.9 per cent a year mentioned above) while it fell to 1.4 percent in middle-income countries. Because of rapid domestic population growth, despite this continued outflow, international migrants accounted for two per cent or less of the total population of Africa, Asia, Latin America and the Caribbean. By contrast, in Europe, Northern America and Oceania, international migrants accounted for at least 10 per cent of the total population. The number of international migrants worldwide has grown faster than the world’s population. Thus, the share of migrants in the total population increased from 2.8 in 2000 to 3.4 per cent in 2017.

Meanwhile, because of unabated interna conflicts, the global level of forced displacement across international borders continues to rise. By the end of 2016, the total number of refugees and asylum seekers in the world was estimated at 25.9 million representing 10.1 per

cent of all international migrants. The developing regions (starting with Turkey, Palestine and Lebanon) hosted over 80 per cent of refugees and asylum seekers in 2016. Given that a large majority of refugees is hosted by developing countries, and that many refugees reside in countries of first asylum for over a decade, there is an urgent need for sharing the burden and responsibility of hosting and caring for refugees more equitably.

Growing international migration have been accompanied by massive regional and rural-urban migration in the developing and transitional countries, as symbolized by the acceleration in the rate of growth of slums in most Third World cities or by the emergence of a tolerated ‘urban floating population’ of 120 million tolerated internal migrants providing cheap labour to the construction and service sector of urban China. In both populous South Asia and Sub-Saharan Africa, the present low level of urbanization (less than 30 per cent) is likely to increase in the years ahead – possibly facing some of the problems encountered in the past in the now developed countries (see section 2).

On current trends, rapid change in all the variables discussed above, is likely to intensify in the future. Global financial markets seem poised to continue expanding despite their high volatility and recurrent crises. And the aging and demographic decline in the Old Continent and rapid population growth in SSA and parts of South Asia (combined with the persistence of huge differentials in living standards and human freedom between these regions) may lead to an intensification of world legal and irregular migration, regardless of the migration policies that will be adopted in the countries of origin and destination. In turn, rural-urban migration will increase in both Asia and Sub-Saharan Africa. Rapid economic, social and institutional change – in other words – is not over and, indeed, it may intensify in the years ahead.

In principle, most of the perspective changes alluded to above were supposed to have – and should have in the future - the potential for improving political freedom, living standards and health conditions. Yet, as discussed in the case studies presented in Part 2, these potentially positive changes may take place in an abrupt, unexpected and uncontrolled way, or in the absence of policies to improve their success and control their negative side effects. For these reasons, they may weaken the collective and individual ability to adjust harmoniously to new situations and enjoy the benefits of the changes underway. As already happened in the past, the difficulties in foreseeing, understanding and harnessing ‘unexpected change in situation of institutional weakness’ may thus entailed considerable health costs, including in terms of higher mortality. In addition, even when the aggregate health impact of rapid change may turn out to be favourable, a rise in social stratification may reduce the relative health gains of marginal groups with low levels of education, a limited capacity to participate in new economic and political institutions or living in remote areas. The combination of rapid change and social segmentation therefore may thus led to a highly skewed distribution of the health gains generated by the new changes. In fact, in the past, the transition from a low social equilibrium to an ex-ante higher equilibrium seldom occurred in a linear way. In many cases, it generated large ‘transformational costs’.

2. Mortality crises triggered by potentially favourable political and economic changes

Hereafter we analyse six case studies of past and recent political and economic reforms that – despite expectations of improvements in living conditions and life expectancy - led to a surge in mortality. The paper deliberately ignores the negative impact of recessions, contractionary adjustment policies, wars, sanctions and disasters that were indeed expected *ex-ante* to affect negatively the health status of the population involved. The main aim of this review is to understand the factors and pathways that caused a health deterioration in spite of the favourable impact expected *ex-ante*. Tentatively, one could identify four types of situations:

2.1 Progressive political reforms and rising mortality

The abolition of slavery in the USA, 1850-1880.

A classic example of the negative impact of a positive political change is offered by the abolition of slavery by means of the Emancipation Proclamation of Abraham Lincoln on 1 January 1863, right in the midst of the 1861-65 Civil War (Meeker 1976). Life expectancy at birth for the blacks declined sharply between the last decade of slavery (1850-60) and 1880 due to rising incidence of nutritional and infectious (especially smallpox and cholera) diseases. Downs (2012) estimates that about a quarter of the 3.1-4 million Southern slaves either died or suffered from serious illness between 1862 and 1870. The primary reason for the rise in death rates was not so much a change in disease patterns and medical practices, but the disruptions in social organization and living conditions associated with the abolition of slavery. During the slavery, the health and nutrition of the slaves depended on their owners, who had an economic incentive to keep them in good health. The health and nutrition of the freed blacks, in contrast, were influenced negatively by their inability to obtain medical care from a non-existent public health system and costly private providers while the Northern political authorities did not introduce any basic health schemes for the freed slaves. Declines in health status were also due to negative changes in housing conditions and income earning opportunities. Many freed slaves were placed in unhealthy ‘contraband encampments’ near union army barracks, and were unable to obtain compensation for their enslavement or land to grow food, a fact that reduced their agricultural output and food intake. Most of them had in fact to survive by selling their labour as casual workers during a period of extreme turmoil.

Thus, while the abolition of slavery was a noble and idealistic decision, as well as a shrewd political manoeuvre by Abraham Lincoln who, in this way, increased the number of soldiers fighting for the North by 200.000 units, the freeing of the 3.1 to 4 million slaves in the South without simultaneously ensuring them minimum income-earning opportunities and access to basic housing and health turned out to be the cause of sharp health deteriorations.

The South African transition to democracy, 1989-2004.

South Africa’s transition from a supremacist regime to a multiparty ‘rainbow’ democracy was not an easy one. The country experienced two different, if interconnected, transitions. The first was from *Apartheid* to democracy, the second from an inward-looking to a neo-liberal market economy.

The political transition had began in the late Seventies-early Eighties with the introduction of a few adjustments motivated by poor economic performance of the country and the desire of raising an abysmally low supply of skilled African workers whose shortage was a key factor in limiting the growth potential and domestic demand. The years between 1982 and 1987 saw the creation of the first political organisations, the dismantling of petty *Apartheid* and the creation of a tri-cameral parliament. Despite these concessions, political violence intensified. The state responded declaring in 1986 the state of emergency, handing over power to the security establishment and launching urban renewal programs in townships characterized by political tensions. This response raised the death rates among the Blacks and, to a lesser extent, Whites. By the early 1990s, political compromise started prevailing, leading to the 1994 end of *Apartheid*.

The newly acquired political freedom was accompanied by considerable debate about the choice of policies in the field of nationalisation, land reform, fiscal policy, taxation and FDI. In the end, the ANC government gave priority to a growth driven by the ‘trickle down approach’ and the provision of urban basic services to reduce poverty and tensions. The neo-liberal nature of these reforms became clearer with the adoption in 1996 of the Growth Employment and Redistribution (GEAR) program that focused on private investment-led growth, with no explicit targets for the reduction of poverty and inequality.

The restoration of democracy, end of sanctions and election of a government committed to social change were expected *ex-ante* to affect positively growth, poverty reduction and health status. However, the existing data do not easily permit to trace the health impact of the transition due to long standing registration problems and the blurring effect of HIV-AIDS. Nevertheless, the available evidence suggests that – on balance - the political reforms did not improve health status. Three factors may explain this unexpected outcome:

Economic performance improved only modestly in relation to the *Apartheid* years. Per capita income growth was negative over 1990-5 and turned barely positive since 1996. Meanwhile income inequality worsened (Table 3). As a result, poverty increased, with likely negative effects on health. This disappointing performance can, at least in part, be attributed to the legacy of *Apartheid*. Yet, the key issue was that while GEAR improved the macro fundamentals it failed to create jobs (Streak, 2004; Terreblanche, 2002). As a result, poverty and inequality continued to increase in the second part of the 1990s.

Table 3. Income distribution changes in South Africa, 1991-2001

Households	Share of total income			Changes	
	1991	1996	2001	1991-1996	1996-2001
Bottom two quintiles	3.8	3.4	3.3	-11.0	-3.0
Third quintile	7.6	7.4	7.3	-0.3	-0.1
Fourth quintile	17.6	17.4	17.2	-0.1	-0.2
Top quintile	71.0	71.8	72.2	1.1	0.6

Source: Adapted from Terreblanche (2002), p33. Cited in Desmond and Boyce (2003).

Public policy deliberately aimed at improving social conditions. Government spending on health, welfare, education and housing rose from around 50 per cent of non-interest expenditure in 1990/1 to an average of 60 per cent between 1995 and 2002 (Desmond and Boyce 2003). Free health care was made available to pregnant women and small children, a

school-feeding scheme was started, health care was decentralized and a programme of clinic building and renovation was initiated. Though hampered by limited capacity and expenditure constraints, these programme were expected to affect favourably health and start reversing long-standing health inequities. Nevertheless, in the end only 20 per cent of the poor received a grant owing to limited fiscal capacity (Streak, 2004). Another priority of the new government was to increase access to water, sanitation and electricity and, as a result, the availability of piped water rose from 78 to 83 per cent between 1995 and 1999 (Desmond and Boyce 2003). Despite these improvements, the country experienced two cholera epidemics since 1994, as the program did not reach the ultra-poor or because consumption remained low because of high costs and distance.

With the removal of influx control, migration to already overcrowded townships rose sharply due to lack of employment opportunities in rural areas. The new government embarked on a massive low-cost housing program that produced over a million new homes since 1994, with the result of raising the share of families living in formal housing. Yet, for a variety of reasons, the share of households living in informal housing rose from seven to 12 per cent during the same period, thus offsetting the impact of the program in reducing the spread of TB, pneumonia and HIV.

A second unexpected pathway through which the political transition affected health status was via a surge in violent deaths and political assassinations that increased sharply over 1987-1990 to subside from the early 1990s. As a result, the cases of political violence in urban areas fell from 2500 in 1990 to less than 500 in 1994 (Barbarin et al 1999). Yet, such fall appears to have been accompanied by a rise in criminal violence (*ibid.*). Indeed, the political transition occurred in an environment of widespread violence, easy access to weapons, little confidence in an ill-equipped police force and weak capacity of the criminal justice system. During the *Apartheid* years, civil disobedience, boycotts, and even political violence were considered by most legitimate tools of political struggle. In turn, the state responded to these acts in an even more brutal way. All this contributed to the creation of a culture in which violence was the main tool for resolving all political and personal disputes.

The longer-term impact of all this was a sharp rise in criminal activity and violent deaths between 1987 and 1990 and after 1990. Between 1980 and 1990, the murder rate rose by 32 percent, rape by 24 and burglary by 31 (Shaw, 1996). In turn, over 1990-4, the number of murders fell only marginally, from 16.000 cases in 1990 to close to 15000 in 1994, as the fall in political assassinations was almost completely offset by a rise in criminal ones. In addition, other crimes continued to increase, with assault climbing by 18 percent, rape by 42, robbery by 40 and burglary by 20 (*ibid.*). By 1996, hospital records showed that a daily average of two and a half thousand South Africans received treatment for stabbings, assaults and shootings. Data for 1994-1997 from the key districts of Soweto and Gauteng confirm the trend towards falling political brutality but rising criminal violence (Barbarin et al, 1998). The sense of insecurity, and fear of being attacked while at home or in the street rose for all ethnic groups. Such fear and the stress-related mortality may be another channel through which the transition affected health status.

Finally, over 1980-2005 South Africa experienced an epidemics of HIV-AIDS whose incidence started declining slowly only since around 2005. No doubt, the epidemic would

have occurred regardless of the political transition, but the latter may have accelerated its diffusion. The removal of control on internal migration, political violence and reforms-induced urbanisation increased mobility within the country, thus facilitating the spread of the epidemic. The increase in rape associated with political violence was another factor of infections. The inefficient management of the health care system during the reform process reduced the quality of medical assistance (Desmond and Boyce, 2003). Last, by attracting most of the public attention, the political transition inadvertently contributed to a neglect of the disease and of the initial signs of its diffusion.

While the overall effect of the transition was certainly positive, path dependence and the adoption of neoliberal policies did not allow achieving better health outcomes. In turn, fiscal restraint prevented to benefit from the changed expenditure priorities being realised. Therefore, while if compared to no action, health outcomes have most likely been better because of the transition, they are quite possibly not, what they could have been in equilibrium B2 in Figure 4.

2.2 Migration, slow supply of urban infrastructure and rising mortality

A third case in which potentially positive long-term changes can lead to a worsening of health conditions concerns the acceleration of migration to urban areas. Over the short to medium term, uncontrolled migration has been shown to reduce life expectancy in several cases. Indeed, while higher incomes per capita, improved access to public services and enhanced collective hygiene generally lessen mortality over the long term, the short-term effects can be quite negative. A first cause of this problem is the rigid supply of social infrastructure. While city-based industrialization offers more jobs and higher wages than in the countryside, the inability to expand rapidly water, sewerage and transport services, can raise the incidence of airborne, waterborne and infectious diseases in peripheries that have become reservoirs of various kinds of epidemics. A second cause concerns the equally rigid supply of housing. The result is overcrowding in low-standard barracks where bad hygienic conditions create an inviting milieu for tuberculosis and other infectious diseases. A third factor relates to human behaviour. Immigrants mostly come from rural societies where strong social control prevails and opportunities for deviant behaviour are few. Once in the cities, the new immigrants can easily be lured into deviant activities or the consumption of alcohol, drugs or other substances that increase the risk of violent death.

Rapid urbanisation and mortality increases in 19th century Britain.

An example of deterioration in mortality during a period of growth and overall improvement in living standards is that observed during the rapid industrial growth of the second and third quarter of 19th century Britain (Szreter 1997). During this period, mortality deteriorated because of the disruptions caused by rapid urbanization, inadequate development of water and sanitation systems, residential segregation, and rising income and wealth inequality. While during the period of moderate growth of 1730-1820 nationwide life expectancy at birth rose from 32 to 40 years, between the 1820s and 1870s large industrial cities such as Manchester and Liverpool and small but fast growing towns experienced an upsurge in mortality. The rise in mortality was mainly due to the spread of infectious and waterborne diseases, particularly among the infants of new migrants who lived in quarters without safe water supply and adequate sanitation. As a result, life expectancy in these cities did not rise, and fell by about one year in some of them, despite a steady increase in urban wealth.

More generally, distress migrants – and especially their children - face greater mortality risks than people who remain in their community. Poor migrants often do not have the resources to access the rental market and – in the absence of public interventions in the housing sector – end up living in slums characterized by lack of basic water, sanitation and power infrastructure. Indeed, because of the considerable costs and time required to develop basic urban infrastructure, a rapid surge in migration tends to be accompanied by overcrowding and poor sanitation and reduced access to potable water. In addition, distress migration entails considerable material hardship, disorientation due to the inability to operate easily in new environments, breakdown of social relationships, redefinition of survival strategies and greater stress. Unsurprisingly, in very many developing countries, while the IMR of urban areas is consistently lower than that of rural areas, IMRs in slums – especially slums hosting new migrants - are higher than the average for rural areas.

The policy message of the Szreter study is clear. While ‘governed migration’ has been shown to generate considerable productivity and welfare gains in both places of origin and destination (Williamson 1996), sudden and uncontrolled surges in migration tend to generate pressure on the urban infrastructure and rental prices, overcrowding and the risk of spreading infectious, water-born and other ailments among both the migrant and local populations.

Rising male mortality during the urbanisation of Sweden, 1810-50

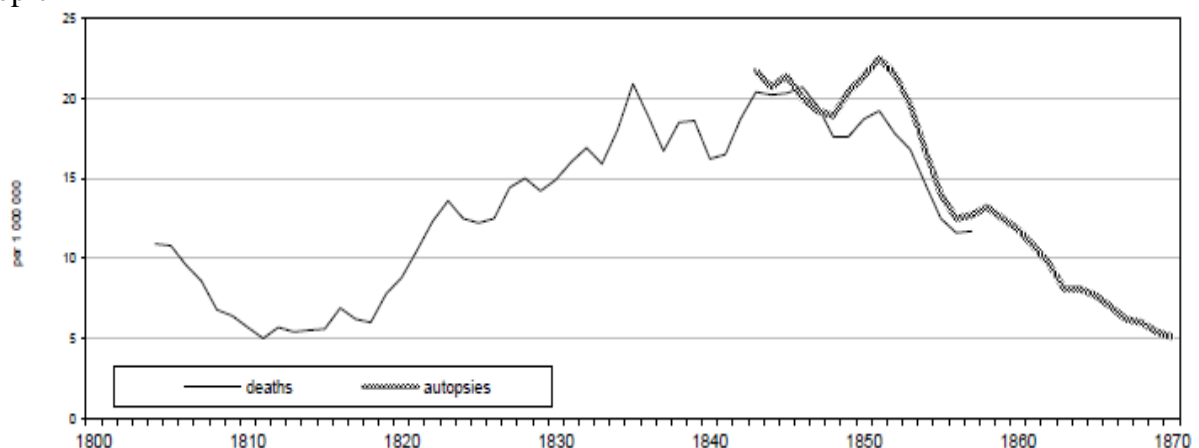
Until the early nineteenth century, Sweden was an agrarian society dominated by Lutheran values where the church exerted a strong social control on rural folks (Sundin and Willer 2002). The transition from this pre-industrial society began with the slow urbanization of the early 1800s, though significant industrialization took off only since 1849 and peaked around 1870. Indeed, new farming techniques increased productivity in agriculture and so released part of the rural workforce that migrated to the cities to find jobs as servants, or unskilled labourers in small foundries and sawmills.

This migration was accompanied by perceptible demographic and social changes. To start with, the difficulties encountered in finding steady jobs in the cities raised the average age of marriage among the lower classes as well as the illegitimacy rate, a trend made possible by the loosening up of social control. The crime rate rose too in parallel with growing social polarisation and alcohol consumption. Violations ranged from minor episodes, to aggression against members of the upper class, to theft and homicide. Health status showed important changes during this period. While mortality among children and women declined, that among adult males rose or stagnated at high levels. IMR declined steadily from 190 per thousand in 1810 to 120 per thousand in 1860 (*ibid.*), thanks to the growth in food production, spread of health infrastructure and improved urban sanitation (Edvinsson and Nielsson, n.d.). For instance, a growing number of district physicians and trained midwives offered greater curative care and actively promoted breast-feeding, modern childcare practices and child immunisation. In the cities, the decline in infant mortality was driven also by improvements in sewerage, garbage collection and protection of water sources (this point is however questioned by Edvinsson and Nilsson, n.d.). Mortality among young and middle age women followed a pattern similar to that of children, likely because of the general improvement of nutrition and sanitary conditions and the rise in the proportion of births assisted by trained midwives. Yet, for older women mortality did not decline at the same pace, because of the material deprivation in which poor spinsters and widows had to live.

In contrast, mortality among men rose and remained at levels higher than that of 1800 until around 1840-50. This meant that the male to female mortality differential – already high prior to 1810 - rose further during the first half of the nineteenth century. This was particularly evident in the case of single unskilled migrant workers. The biggest male-female differentials were recorded for deaths due to alcohol intoxication, accidents, violence, suicides and tuberculosis. This rise in mortality gap was due not so much to differences in income, as men’s salaries were generally higher than those of women, but rather to differences in lifestyles. Unmarried men were more likely to adopt unhealthy behaviour, while unmarried women internalised gender roles emphasizing a quieter conduct and participation in supportive social networks. For men, secularisation, greater anomia and the decline of social control that accompanied the migration to the cities, led to the adoption of more violent and risky lifestyles. In addition, the old norms of reciprocity and survival strategies of the agrarian society no longer worked in the cities. Finding oneself in a new milieu often generated a sense of being uprooted, especially for those lacking kin networks on which to rely in case of need. Under these new circumstances, alcohol emerged as an important stress reliever.

Although there are no reliable data for the first half of the 19th century, several factors suggest there was a substantial increase in alcohol consumption during this period. For instance, registered deaths due to alcohol intoxication peaked in the 1840s (Figure 4). In towns, alcohol could be bought everywhere at low price and restrictions on production and sales were minimal. Certainly, the mortality impact of alcohol consumption was greater than that indicated by the registered cases of acute intoxication. Heavy drinking affected also nutritional status, housing conditions and hygiene. Even lung diseases, stroke, accidents and suicides were in part due to excessive drinking. Another factor that contributed to the adverse mortality trend among adult males was the slow improvement of public sanitation. The development of public water and sewerage infrastructure in the new settlements inhabited by migrants lagged in fact behind the growth of cities and so contributed to a rise in deaths due to waterborne and airborne diseases.

Figure 4. Number of cases of acute alcohol intoxication (deaths and autopsies) per 1.000.000 people



Source: Sundin and Willer (2002)

2.3 Contact and contagion between heterogeneous populations

The socio-environmental crisis recorded during the construction of the Panama Canal.

The demographic crisis that hit Panama City and Colon on occasion of the construction of the Panama Canal is a good example of the economic, social and environmental imbalance generated by the massive influx of workers in various parts of the country, including in its rainforest. The arrival of the French Canal Company was expected to generate a favourable impact on employment, growth and health. However, it instead led to speculative increases in rents and food prices and so made the life of poor Panamanians more difficult (Jackson et al., n.d.). In addition, the intrusion into Panama's rain forest upset the delicate balance between urban and forest disease pools.

An analysis of the deaths registers of two parishes shows a marked if diversified increase in mortality over 1884-9 that is the period of the first attempt to build the canal by the French Canal Company. During this period, diseases such as malaria and yellow fever – whose etiologies were not fully grasped at that time – decimated the French Canal Company and taken the lives of approximately 20.000 able-bodied workers (Mina Stern, 2005). The analysis of death registers shows also a major mortality decline between the period 1884-9 and the 1890s, that is the years in which the project was abandoned and mortality returned to its normal level. Finally, it shows as well as sharp class differentials in mortality between the poor parish of Santa Ana and the better off one of La Merced. Indeed, between 1884-9 and 1889-93, death rates dropped from 38 to 13 per thousand in La Merced and from 66 to 28 in the poor neighbourhood of Santa Ana.

How did the construction of the Canal cause such a health crisis? The influx of thousands of West Indian workers caused overcrowding and severe sanitation problems in the urban areas of the city. Overcrowding facilitated the spread of contagious diseases, while the deterioration of drainage and garbage collection created numerous locations for mosquitoes to breed. Since these were the main vector for malaria and yellow fever, the incidence of both maladies rose sharply in urban areas. However, mortality rose as sharply in the work camps along the Canal route, if for a different reason. Indeed, thousands of workers came into contact with a mosquito unique to the Panama rainforest and endemic in wild primates living in it. Such mosquito acted as the main vector of yellow fever, thus sharply increasing the contagion in the work camps.

With the suspension of the construction of the Canal and the exodus of the workers, the mortality crisis abated. The construction of the Canal was resumed by the USA government which took possession of the of the Isthmus of Panama in 1903. Such large-scale effort was not followed by a mortality crisis like that of the 1880s. The US government had learned the public health lesson of the first attempt and instituted large-scale public health measures to eliminate the threat of yellow fever, malaria and other tropical diseases before continuing the construction of the Canal to its completion. President Roosevelt dispatched to Panama a public health team with the brief of eliminating the mosquitoes carrying yellow fever and malaria. This was achieved by the systematic destruction of the mosquito larvae, eliminating any body of standing water (such as water thanks and cisterns), by introducing quarantine stations, increasing the supply of running water and through the introduction of other public

health measures such as fumigation, garbage collection, and so on that led, among other things, to the eradication of yellow fever from the area.

2.4 Liberal market reforms and health crises

In some cases, the introduction of potentially beneficial economic reforms generated negative health outcomes. A first explanation of this unexpected outcome is that reforms were applied under conditions of incomplete markets and institutions. Another explanation focuses instead on the problems caused by incomplete reforms, as the changes introduced were only a subset of those that needed to be introduced. This means that each reform taken alone does not necessarily generate improvements that depend on simultaneous changes in many areas. A third explanation concentrates on the “sequencing problem” that arises when reforms are introduced in the wrong order. This problem is well known in macroeconomics (when, for instance, the liberalisation of capital movements takes place before macroeconomic stabilization is achieved) or in transition economics (when price liberalisation and privatisation were introduced before competition reforms were introduced). A final explanation focuses on the workers’ and entrepreneurs’ “inability to adjust” to sudden and unanticipated changes in economic circumstances.

Market liberalization and rising suicide rate among cotton farmers in Andhra Pradesh 1997-06. In spite of its recent success in diversifying her economy, in the late 1990s and early-mid 2000s India still depended on agriculture as the main source of livelihood for 70 per cent of her population. No surprise therefore that in the 1970s and 1980s, the years of the Green Revolution, policy making focused strongly on this sector. Indeed, the success in raising agricultural output and reducing rural poverty during the 1980s depended to a considerable extent on public support in the field of rural credit, input subsidies and stable input and output prices.

However, following a severe macroeconomic crisis, in July 1991 the government introduced a new policy approach emphasizing the reduction of state controls, subsidies and investment in agriculture, the enlargement of the role of the market and greater integration with the global economy. Within this approach, the agricultural reforms emphasized a reduction in price support and input subsidies, the encouragement of subsistence farmers to enter input-intensive productions for the domestic and international markets, and the liberalization of the imports and exports of agricultural commodities. In particular, subsidies on fertilizers, electricity, irrigation and credit were reduced, interest rates on farm loans liberalized, and rural banking privatised. In political-economy term, such changes signalled the marginalization of the farming community in the policy-making process.

When markets are complete and function well, the kind of reforms introduced in India in 1991 may lead to a more profitable allocation of resources among crops, continuous adjustments to changing market opportunities, faster growth of agricultural incomes and better health for rural dwellers. Such policy approach was however far less favourable in many areas of India during the 1990s and 2000s, in part because of the weakness of the safety nets established to deal with the transitory costs associated with the liberalisation of agriculture, but mainly because of the inherent weakness of credit, insurance, input and output markets and a surge in uninsured price volatility following the globalisation of Indian agriculture. Lack of statewide regulation lead also to a ‘fallacy of composition’ as many

farmers experienced increased dependence on groundwater and credit to finance a growing number of bore-wells. This led to a rapid depletion of the water table, followed by repeated attempts to deepen the wells. Galab, Prevathi and Reddy (2012) report the case of a village, where 35 years ago there were only 6 tube-wells and the water table was at six feet from the surface. Nevertheless, by 1998, there were 1800 bore wells, half of which were dry, and the water table had fallen to 240 feet.

The first spurt in farmers' suicides occurred in 1986-87, i.e. before the introduction of the neoliberal reforms mentioned above. There were also a few cases of suicide in the later years, but these early warnings of rural distress were ignored as aberrations. It is the second spurt that began in 1997; the farmer suicide problem became a recurring phenomenon.

One of the districts where such impact was most visible is the semi-arid and backward Warangal district of Telangana state in Andhra Pradesh that experienced a surge in suicides among small cotton farmers over 1998-2006 and beyond (Table 4, left panel). A study by Sudhakumari (2002) covering the years 1997-2002 analysed the economic circumstances of the households of 50 randomly selected suicide victims who lived in 5 Mandals of Warangal, the district that recorded the highest number of suicides in Andhra Pradesh. The study shows that 66 per cent of the farmers who committed suicide had less than 40 years, an age group usually characterized by a low suicide rate, while 48 of them were male, all were married and belonged to low-income families with limited resources and education. Indeed, 31 out of 50 of them were illiterate, 44 belonged to backward communities or scheduled castes, 18 were landless leaseholders and 22 had less than 2 acres of land. Galab, Revhati and Reddy (2012) extend such analysis to 2006 using a broader information basis (including the systematic compilation of suicide reports mentioned in the local Telugu press) and focussed on 4 districts, one of which was Warangal. Except for the latter, agriculture was the main source of income. Their study confirmed the findings of Sudhakumari (2002) about the socio-economic characteristics of the farmers that committed suicide. In particular, they found that 86 to 97 per cent of the deceased were men in the 30-50 age group. 46-63 per cent were illiterate and belonged to Backward Castes and Scheduled Castes and Tribes. The majority were marginal and small farmers (who experienced higher suicide rates than farmers with a few hectares of land) while some 10-15 per cent were tenants or tenants, cum-owner and upwardly mobile middle level farmers.

The study by Galab, Revhati and Reddy (2012) and the studies cited therein identified the main correlates of the increase in suicides. These included a dependence on ground water (i.e. (dug wells and bore wells)) as a source of irrigation; the share of non-food commercial crops in total output; dependence on expensive informal credit for working and fixed capital (89 per cent among micro farmers versus 50 per cent for farmers with more than 10 hectares); high dependence on market inputs; the volatility of output prices, and the proportion of income that farmers were forced to spend on education, health and social events. In contrast, the risk of suicide fell when the sources of household income were more diversified.

These personal correlates point to a class of ill-trained and financed small farmers who entered commercial production without the technical support needed to deal with the complexity of the new productions, or adequate arrangements to withstand the problems caused by incomplete credit and insurance markets and volatile world commodity prices.

Table 4 Suicides among cotton farmers in Warangal district and Andhra Pradesh, 1997-2006

Year	Number of suicides in Warangal		Number of suicides in Andhra Pradesh	
	Sudhakumary (2002)	Galab, Revathi and Reddy (2012)	Sudhakumary (2002)	Galab, Revathi and Reddy (2012)
1997	16	52	28	108
1998	109	69	307	190
1999	71	100	211	180
2000	50	98	147	220
2001	31	119	89	357
2002	39	123	120	328
2003	...	92	...	342
2004	...	88	...	1795
2005	...	51	...	617
2006	...	26	...	369
Total	316	819	902	4403

Source: based on State Crime Records Bureau cited in Sudhakumari (2002) and on Galab, Revathi and Reddy (2012)

What led to the increase in suicides? During the period under examination, Andhra Pradesh was affected by adverse weather and pest conditions that caused severe crop losses and could have – in principle - contributed to a surge in suicides. However, such problems were not new in the region and did not cause any perceptible rise in suicides in the past. The cause of the crisis lied therefore elsewhere.

Also in Warangal and the other three villages analysed, the drive to integrate subsistence farmers into the market economy entailed a considerable increase in the input-intensity of production, particularly in the case of cotton, a crop that requires improved seeds, electricity, water, fuel, fertilizers and pesticides. Expectations of high world prices, encouragement to enter commercial farming by the local government and private distributors of seeds produced by multinationals convinced many small farmers to shift from low-risk/low-inputs subsistence crops to high-risk/high-cost export crops with potentially high-returns. As a result, the area under pulses fell, that under wheat, rice stagnated, and that under commercial crops rose. For instance, in Warangal, 89 per cent of the families of the farmers who killed themselves grew only cotton.

Second, the change in crop mix and the subsidy cuts mentioned above caused considerable shifts in the economic circumstances of small farmers. To start with, the input intensity of production rose in line with the shift to export crops that required much larger input costs per acre. For instance, in late 1990s land cultivated with cotton entailed an expenditure of 18.250 rupees per hectare, against one of 4.700 rupees for maize. As four-fifths of the cultivable land in the region needed irrigation, the shift to cotton induced a sharp increase in capital and recurrent costs for well irrigation. Dependence on purchased seeds increased as well, right after seed subsidies were withdrawn, a fact that caused a large rise in seeds costs for farmers.

Third, the purchase of growing amounts of inputs entailed a rise in the borrowing requirements of small farmers. While under normal market conditions the latter would have counted on a capillary banking system providing credit at competitive rates, the weakness of

the local financial sector, the exclusion of a third of the deceased farmers from credit because they did not own the land they cultivated, the retrenchment of institutional credit and crisis of cooperative credit pushed the small farmers into the arms of moneylenders and pesticide dealers (Table 5) who charged interest rates ranging between 36 and 60 per cent.

Table 5. Structure of the indebtedness of the farmers (Rupees)

Sources	Total amount borrowed	% of total borrowing
Commercial Bank	343,012	8
Co-operative Bank	214,382	5
Money Lender	1586,430	37
Pesticide Shop Owner	728,900	17
Middle Man	1200,542	28
Private Financial	85,753	2
Institutes/Friends/Relatives	128,629	3

Source : Sudhakumari (2000)

A fourth factor was the volatility of cotton prices. Trade liberalization exposed the Indian farmers to the vagaries of global commodity markets, without providing them with any mechanism (such as crop insurance or a price stabilisation fund) to compensate them for swings in world prices and international competitiveness. While in 1994-5 the domestic price of cotton rose steeply, it then began to fall, against all expectations, since 1997 in line with the decline of world prices and the rise of cheap imports. In addition, credit dependence on moneylenders and middlemen forced the indebted farmers to sell them most of their output at prices below those prevailing on local market. Government policies did not help either as they allowed the textile mills to import cheap cotton lint despite the existence of a growing domestic cotton surplus. Thus, from the perspective of becoming an exporter, the country became an importer of cotton produced in countries that subsidized its production and sale.

The withdrawal of input subsidies was a fifth source of economic stress. As noted, after the introduction of structural adjustment policies in 1991, the price of fertilizers doubled while subsidies to canal irrigation and electricity were cut. Public investment on irrigation fell to a minimum, unloading in this way the cost of irrigation on the farmer. A final factor was the failure of public extension services that, during the liberalization suffered a major reduction in the number of agricultural officers. Even though, the agriculture department was well aware that the red soils of Warangal were not suitable for cotton cultivation, they never advised the farmers to stop growing cotton or bothered to advise them about the proper amount and type of pesticides required per acre. As a result, 83 per cent of the households interviewed in Warangal cultivated cotton based on limited self-knowledge or depended for new information on unscrupulous dealers of pesticides and seeds who often provided interested and inaccurate advice and sold low quality seeds and inputs.

The rise in suicide rate in Andhra Pradesh shows that three interlinked factors – the instability of a globalized agriculture lacking any insurance or price stabilisation mechanism, declining state support to public investment, rural credit and agricultural extension, and the absence, inefficiency and interlocked-ness of liberalized output and inputs markets - played a key role in raising indebtedness and economic desperation among cotton farmers some of whom – facing a major dislocation of their livelihoods - experienced despair, loss of self-respect, and the inability to cope with such cataclysmic changes so that, in the end, they committed

suicide. Galab, Revathi and Reddy (2012) place the Andhra Pradesh suicide crisis in the context of the agrarian crisis that affected the state and argued that the suicide increase is only a symptom of a broader crisis that emanated from population pressure and falling farm size, the introduction in the early 1990s of rural reforms little sensitive to the regional specificity of agriculture, the erosion of public institutions for agricultural extension, credit, coordination, and public investment, the adoption of yield increasing technologies without the prior introduction of adequate infrastructure and state coordination, and without solving prior to the introduction of the reforms the problems caused by an irrational distribution of land.

2.5 The transition to the market economy and liberal democracy of the former socialist countries of Europe, 1989-2014

Mortality and life expectancy trends

The transition to the market economy of the communist countries of Europe was universally greeted as a key step towards world peace and economic progress. The months preceding the beginning of this historic watershed were characterized by widespread hopes for improvements in political freedoms, economic growth, living standards and life expectancy that, during the prior 20 years, had improved more slowly than in capitalist Western Europe, or had deteriorated. Yet, despite these widespread hopes, since 1989 – that is conventionally assumed as the onset of the European transition – the ‘shock therapy’ approach that - unlike in China – was followed in most of the region was accompanied by a severe transformational recession and an acute mortality crisis. The years immediately after 1989 were characterized by an unprecedented fall in output and incomes, the rapid impoverishment of large sections of the population, rising income and assets concentration and widespread social dislocations³. Thus, with the exception of Slovenia, during the first reform years male life expectancy at birth fell and the Crude Death Rate rose in *all* European economies in transition. For instance, over 1990-91 Poland recorded about 30.000 excess deaths in relation to 1989, while Hungary registered about 7000 excess deaths over 1992-3 (Annex Table 1). Thus, also in Central Europe, loss of human life was sizeable from a welfare perspective though not in terms of demographic trends. In this sub region, the economy, living standards and LEB started to recover already in 1992-94 while mortality rates and the number of deaths declined. As a result, over 1989-2014 these five countries taken together recorded about 730.000 *fewer* deaths than it would have been the case if the 1989 number of deaths had remained constant throughout this period (Table 8 and Annex Table 1). While country-specific factors played a role, the steady fall in death rates after 1991-2 in these countries appears to have been also due to some common factors. All of them began the transition with much smaller initial economic and social distortions than the CIS countries⁴, they all experienced less acute and

³ Over 1989 and 1996 alone, the number of poor and unemployed in the region rose respectively by 100 and 10 million while the crime rate tripled (UNICEF, 2000).

⁴ Cornia and Popov (2001) developed a cumulative measure of ‘initial distortions’ as a percentage of GDP for all economies in transition. Such measure is the sum of defence spending exceeding 3 per cent of GDP (a level regarded as normal), deviations from a normal level of the industrial structure (particularly the over representation of the inefficient heavy industry) and heavily distorted trade among the Former Soviet Republic and lightly distorted trade within the socialist countries. While Hungary and Slovenia had an index of initial

short-lived recessions and inflationary spikes and only moderate surges in income and asset inequality. All of them introduced extensive labour market programmes to soak up the transitional unemployment, while public expenditure on health increased, and alcohol consumption either stagnated or increased modestly. Family instability and distress migration during this period were also modest. Moreover, none of these nations experienced the massive weakening of state institutions in the area of law, order, and personal security that was observed in several CIS countries. Finally, their faster political democratization and active role played by intermediate social bodies (such as cooperatives, churches, trade unions, cultural and sports association) contributed to keep up the pressure on incumbent governments to tackle the social dislocations entailed by the transition.

The mortality crisis was much sharper in South Eastern Europe, the Baltic States and, especially, the members of the Former Soviet Union with large Slavic populations that is Belarus, Kazakhstan, Moldova, the Russian Federation, Ukraine and Lithuania. In these countries, the initial recovery in economic activity and male LEB over 1995-98 was interrupted over 1998-2003 due to the 1998 rouble crisis and devaluation, default on the public debt and capital flights, and by the sluggish economic performance over 2000-2002 that was quickly transmitted to the neighbouring countries. LEB started recovering in a sustained way in 2003 in Russia and in 2005 in Belarus and Ukraine. In Russia, male LEB rose by 6.7 years between 2003 and 2014, suggesting that the country is exiting the mortality crisis of the prior 15 years. Yet, the 1989 level of male LEB was reached again only in 2012. In Belarus and Ukraine, the 1989 level of male LEB was recovered in a stable way only in 2013 (Table 6).

What were the factors behind such rebound? Grigoriev et al (2014) show that the main causes of death that triggered the increase in mortality over 1989-94 (that is cardiovascular and external causes) were the same that explained its decline over 2004-10 and beyond (see later). The possible explanations put forward to explain such important rebound in Russia include a stable consumption of alcohol per capita accompanied by an increase in wine and beer drinking and a decline in the consumption of spirits; a decline in alcohol poisoning; a diet improvement (but no changes in smoking); a rise in health expenditure per capita from \$PPP 300 in 1995 to 998 in 2010; an increase in cardiac surgeries per 100.000 people of over 35 years of age from 21.7 in 1995 to 97.5 in 2010. The sources of social stress also became less threatening with a return to a more stable life. With the recovery of the Russian economy over 2003-10 there was a fall in the unemployment rate from 9.8 to 7.5 per cent, a drop in the poverty rate from 29 to 12.6 per cent and a modest fall in the crime rate from 201 to 184 per 100.000. Similar improvements were recorded in Belarus and the Baltic countries, while in Poland, Czech Republic and other Central European countries this kind of changes had occurred just after the initial crisis of 1989-1992. In turn, the marriage rate recovered since

distortions equal to around 4 (GDP points), in the Baltics such index ranged between 67 and 71 and in Russia 41. Regression analysis showed that such measure of initial distortions retarded growth in a statistically significant way. Other initial distortions included very different degrees of money overhang, i.e. the excess amount of cash in circulation as a share of GDP that, with a rapid price liberalization caused very different rises in the rate of inflation and macro instability, from moderate in the Czech Republic to hyperinflation in Russia. On this, see also Popov (2000). Such problem, and the inability to develop rapidly a new tax system contributed to the ruble crisis, and default on the public debt of 1998-99, years during which LEB fell again.

Table 6. Changes in male LEB in 21 European transitional economies, 1989-2014.

	Male life expectancy at birth					
	1989	1989-1991	Maximum LEB loss since 1989 and year	Year in which the 1989 LEB level was reached again	Change over 1989-1999	Change over 1999-2014
Czech Rep	68.1	- 0.5*	-0.5 (1990)	1991	3.3	4.4
Hungary	65.4	- 0.4	-0.9 (1993)	1996	0.9	5.8
Poland	66.7	- 0.6	-0.6 (1991)	1992	2.1	5.0
Slovakia	66.8	- 0.2*	-0.2 (1990)	1991	2.2	4.2
Slovenia	68.8	0.7	n.a.	1989	2.6	6.6
Albania	69.6	-0.3	-1.1(1996)	1999	2.1	4.7
Bulgaria	68.6	-0.6	-1.5(1996)	2004	-0.7	3.3
Romania	66.5	0.1	-1.3(1997)	2000	-0.4	5.1
Estonia	66.7	-1.3	-4.6(1994)	2003	-0.3	6.9
Latvia	65.3	-1.4	-4.6(1994)	2002	-0.4	4.4
Lithuania	66.9	- 1.7	-4.3(1994)	2009	-0.5	2.7
Belarus	66.8	-1.3	-4.6 (1999)	2013	-4.6	5.6
Moldova	65.5	-1.2	-3.7(1994)	2008	-1.8	3.8
Russian Fed.	64.2	-0.7	-6.6(1994)	2012	-4.2	5.3
Ukraine	66.0	0.0	-5.0(1996)	2011-13	-3.0	3.3
Armenia	66.0	-0.1	-1.1(1994)	1996	1.7	1.1
Azerbaijan	66.6	-0.3	-1.4(1995)	1997	1.5	3.0
Georgia	67.3	-0.2	-2.9(1993)	1994	0.2	1.1
Kazakhstan	63.9	-1.3	-5.9(1994)	2011	-3.3	6.5
Kyrgistan	64.3	0.3	-2.9(1995)	1999	0.6	1.6
Uzbekistan	67.3***	n.a.	-1.2(1995)	1997	1.3**	2.4

Source: Author 's elaboration on TransMonEE Database 2017 <http://www.transmonee.org> Notes: *1989-90; **1991-1999; *** refers to 1991. n.a. means 'not applicable' as the country recorded improvements throughout the transition; n.d. means not available. Two central Asian countries and all countries of the former Yugoslavia except Slovenia were dropped because of missing data, lack of comparability, border changes and war.

1999-2005 while the total divorce rate declined starting in 1993 in Ukraine, 2000 in Estonia and 2002 in Belarus and other countries (Transmonee 2017). Income inequality seems also to have stabilized since the early 2000s, though in the CIS countries the available data are not very reliable because of the underreporting of top incomes. While these trends are a source of hope, it is equally true that except for the Central European countries but Hungary, male LEB in the region returned to its 1989 level only in in the early 2000s or over 2011-2013 (Table 6). This has entailed a large loss of male life expectancy that continued in some cases until 2011/2013. The trend in female LEB is similar if more attenuated (Table 7).

Table 7. Changes in female LEB in 21 European transitional economies, 1989-2014.

	Changes in female LEB					
	1989	1989-1991	Maximum LEB loss since 1989	Year in which the 1989 LEB level was reached again	1989-1999	1999-2014
Czech Rep	75.4	0.3	n.a.	n.a.	2.7	3.6
Hungary	73.8	-0.1*	-0.1 (1990)	1991	1.3	3.8
Poland	75.5	-0.2	-0.2 (1991)	1992	2.0	4.1
Slovakia	75.2	0.0	n.a.	n.a.	1.8	3.0
Slovenia	76.7	0.7	n.a.	n.a.	2.1	4.7
Albania	75.5	-0.1	-1.2(1993)	1999	0.9	3.9
Bulgaria	75.1	-0.4	-0.7 (1997)	2000	-0.3	3.5
Romania	72.4	0.7	n.a.	n.a.	1.3	5.2
Estonia	74.7	0.1	-1.6(1994)	1996	1.4	5.4
Latvia	75.6	-0.4	-2.3(1994)	1996	1.0	3.3
Lithuania	76.2	-0.4	-1.4(1994)	1997	0.7	2.9
Belarus	76.4	-0.9	-2.5(1999)	2008/9	-2.5	4.5
Moldova	72.3	-1.3	-2.6(1995)	2007	-1.3	4.6
Russian Fed.	74.5	-0.2	-3.3(1995)	2009	-2.0	4.0
Ukraine	75.1	0.0	-2.3(1995)	2010	-1.3	2.7
Armenia	74.7	0.9	-0.3(1993)	1994	0.8	2.6
Azerbaijan	74.2	0.3	-1.3(1995)	1997	0.9	1.7
Georgia	75.0	0.0	-1.8(1993)	2003	0.1	2.1
Kazakhstan	73.1	-0.7	-3.7(1995)	2009	-2.2	5.0
Kyrgistan	72.4	0.3	-2.0(1995)	2008	0.2	1.9
Uzbekistan	75.3*	n.d.	-2.1(1994)	2001	0.2**	2.3

Notes: * 1989-95. ** 1991-92. ‘...’ indicates that the maximum loss was that realized over the first two reform years. n.a. means that the country has recorded steady improvements throughout the transition.

How large was the human cost of the transition? Calculating the number of ‘excess deaths’ during the transition requires the availability of the Standardized Death Rate for each of the 21 countries in Table 8 and the years 1989 to 2014 – using 1989 as the base year for which the age structure of the population is assumed constant over 1989-2014. This would allow separating out the increase in the number of deaths due to higher age specific mortality rates from that due to population aging. However, at the moment, the SDR for all countries and years is not however available to this author. To give the reader an idea of the impact of ‘aging’ on the total number of deaths, the last three columns of the Table 8 lists the changes over 1989-2014 in the age dependency ratio (65+/15-24). These data indicate that with the exception of Slovenia, the Baltics, Romania and Bulgaria, population aging seem to have been of moderate entity in most regions, especially in the Slavic and Central Asian countries. This seems to suggest that, at least in these countries, a good part of the ‘transition mortality crisis’ is due to an increase in age specific death rates, rather than to population aging. In any case, the last three columns of Table 8 give an initial idea of the bias introduced by the use of the CDR instead of the SDR. Except for the countries marked in yellow) seems limited.

Overall, the transition mortality crisis generated in the region over 18 million cumulative ‘excess deaths’ over 1989-2014, of which a rough estimate (taking into account the 1989-2014 changes in the age dependency ratio 65+/15-64) suggests that some 70-80% was due to a rise in age-specific death rates. The most shocking increase in ‘excess mortality’ was observed in the Slavic countries (Russia, Ukraine and Belarus). (Table 8) At the same time, the Central European countries recorded over the same period 746.000 fewer deaths, confirming that in these nations the transition entailed – after the initial couple of years - a decline in the number of yearly deaths.

Table 8. Excess number of deaths over 1990-2014 in relation to 1989 level by country groups*

	Number of deaths (1989)	Excess deaths over 1989 in worst year	Cumulated change in number of excess deaths 1989-2000	Cumulated change in the number of excess deaths 1989-2014	Age dependency ratio 65+ / 15-64			
					1989	2000	2014	Δ 2014- 1989
Czech Rep	127.734	1.791 (1990)	-123.253	- 412.535	18.9	19.8	25.7	+ 6.8
Hungary	146.171	4.182 (1993)	-22.603	- 230.920	19.9	22.0	25.8	+ 5.9
Poland	382.298	22.749 (1991)	37.632	- 79.779	15.1	17.8	21.2	+ 6.1
Slovakia	53.782	919 (1990)	-11.089	- 28.607	15.8	16.6	19.0	+ 3.2
Slovenia*	18.669	1.367 (1993)	4.287	5.204	15.9	19.8	25.7	+ 10.4
Total	728.654	19.267 (1991)	-115.025	-746.637				
Estonia	18.507	3.924 (1994)	15.247	- 8.628	17.2	22.1	27.9	+ 10.7
Latvia	32.570	9.521 (1994)	35.980	17.156	17.6	22.1	28.8	+ 11.2
Lithuania	38.052	8.614 (1994)	46.504	107.279	15.9	20.8	27.5	+ 11.6
Total	89.129	22.060 (1994)	97.730	115.807				
Albania	17.876	2.791 (2014)	-711	- 626	8.6	9.0	17.5	+ 8.9
Bulgaria	108.223	14.062 (1997)	60.675	98.833	18.7	23.8	29.3	+ 10.6
Romania	246.773	39.855 (1996)	209.425	365.668	15.2	19.3	24.3	+ 9.1
Total	372.872	48.566 (1996)	269.389	463.876				
Belarus	103.290	43.883 (2002)	282.915	738.392	16.6	19.7	19.8	+3.2
Moldova	40.002	13.051 (1995)	62.985	85.054	12.7	14.0	13.6	+ 0.9
Russian Federat.	1.580.286	792.049 (2003)	4.873.075	12.284.636	14.3	17.8	18.6	+ 4.3
Ukraine	599.822	195.812 (1995)	1.465.142	3.221.594	17.5	20.2	21.9	+ 4.4
Total	2.323.400	1.003.957(2003)	6.684.116	16.329.676				
Armenia	20.635	8 401 (2011)	40.459	127.531	8.8	13.9	15.1	+ 6.3
Azerbaijan	43.650	11.660 (2014)	48.512	158.904	7.6	8.3	8.1	+ 0.6
Georgia	49.574	10.294 (1993)	12.134	- 31.824	13.3	18.7	20.3	+ 7.0
Total	113.859	25.763 (1993)	101.106	254.612				
Kazakhstan	125.947	44.437 (1995)	289.467	589.105	8.7	10.3	9.9	+1.2
Kyrgyzstan	30.781	7.570 (2006)	32.167	102.998	8.7	9.1	6.6	- 2..1
Uzbekistan	125.788	22.684 (2014)	12.5071	297.454	7.4	7.3	5.9	- 1.5
Total	282.516	68.510 (1995)	446.706	989.558				

Source: own compilation based on Transmonee (2017).

Analysis of the mortality dynamics over 1989-2014 shows that because of the sharp fall of LEB over 1993-4 and, again, over 1999-2005 the number of yearly excess deaths in relation to 1989 exceeded the 700.000 units (Table 8 and Annex Table 1). While over 2002-5 part of such excess mortality was due to population aging (*ibid*), the second dip in health conditions of 1999-2005 generated 3.2 million excess deaths as opposed to roughly 1.6 over 1989-1994. Overall, over 1989-2014 in Russia the sum of yearly excess deaths (in relation to the 1989 level) reached the staggering level of 12. 2 million (Table 8). Also in this case, a modest part of this total is explained by a (limited) aging of the population, especially over 1989-2000 (see the last three columns of Table 8). Indeed, much of the ‘excess mortality’ in these countries was due to a rapid rise in death rates for the age groups 15-19, 20-24, 25-39, 40-59 – that peaked in the mid late 1990s and again over 1998-2003/4 - (TransMonEE 2017) and only in part to population aging.

Large increases in the number of deaths relative to 1989 and its population were observed also in Ukraine and Belarus. In the latter country, male LEB fell for 11 years in a row since 1989, stagnated for another five years, to recover its 1989 level only in 2012-3. In Estonia and Latvia male LEB returned to its 1989 level in 2002 and in Lithuania in 2009 (Table 6). The crisis was acute and long lasting also in the countries of South East Europe.

To put things into perspective it must be noted that already by 1994, the LEB of Russian males had fallen to 57.6 years, 6.6 years less than in 1989 and three years less than that of India, which was then a poor agrarian economy. Likewise over 1998-2003, male LEB fell by 2.7 years. Such crisis is unprecedented in the twentieth century for countries at peace and unaffected by famines or major epidemics. To underscore the dramatic nature of these figures, it suffices to mention that World War II provoked over 1939-45 between 3.3 and 4.6 million civilian casualties in Poland and seven million in the USSR (Alderson, 1981). Likewise, the 1929-33 famine due to the collectivization of the Kulaks’ land in Russia, Ukraine and Belarus caused an estimated additional nine million deaths.

The transition mortality crisis resulted from the overlay of a long-term pre-1989 stagnation in health conditions (not the focus of this paper) and of an acute adjustment crisis. As a result, the mortality gap with the Western European countries and between Russia and its former satellites rose sharply. For instance the male LEB gap between Poland and Russia rose from 4.5 to 8.5 years over 1989-2014 and that for female LEB from 1.0 to 5.1 years. In turn, the male and female LEB gap in relation to Italy respectively rose from 6.9 to 14.7 years and from 5.1 to 8.2 years. It is thus important to understand why in an era of growing opportunities associated with the market economy; the health status of many CIS countries has fallen further behind those of Central and Western Europe. The rapid reduction in cardiovascular mortality that began in Russia during the last decade however has started closing such health gap.

Immediate Causes of Death

What were the disease-specific causes of the fall of LEB after the beginning of the transition? Overall, the surge in death rates during the 1990s and again in several CIS countries resulted from diverging trends for different groups of diseases:

Diseases exhibiting a stable or declining trend in death rates. Mortality due to respiratory ailments mainly followed a declining trend possibly because of the fall in the emission of pollutants into the atmosphere due to the sharp industrial recession experienced during those years. Since the mid-1990s, the trend became less stable, but in no country did it lead to a sizeable rise in deaths. Also of limited importance were the increases in cancer mortality that showed a stable slow upward trend that played a greater role in countries with smaller shifts in overall mortality.

Diseases showing a fast increase in death rates. Close to 40 per cent of the increase in standardized male mortality and a smaller but non-negligible share of female mortality have been due to an epidemic of heart diseases, such as ischaemic heart diseases, sudden deaths due to circulatory problems, and strokes. Interestingly, the fall in deaths due to these diseases (and external causes) accounted for most of the decline in mortality recorded in the Central European countries since 1991 in the Baltic States since 1995-96 and, since the mid-2000s in Russia on occasion of the ‘preventative cardiovascular revolution’ that took place following a rise in the implantation of stents and bypasses (Grigoriev et al 2014). Indeed, the number of cardiac interventions per 100.000 people over 35 years of age quadrupled between 2000 and 2010 (*ibid*). In the countries of the Former Soviet Union, the external causes of death (poisoning, suicide, homicide and all sorts of accidents) also explain an important share of the overall increase in mortality among young people, especially men. For instance, in the Russian Federation the murder rate among 35-39-year-old males increased by 223 per cent between 1989 and 1993 alone (UNICEF, 1994). The transition was also characterized by an increase in deaths due to motor, train and plane accidents, alcohol and other types of poisoning, accidental drowning, fires and work accidents, that is, deaths related to the weakening of the state’s regulatory capacity and the erosion of safety at the workplace.

The escalation in mortality was due also to an upswing in deaths due to *cerebrovascular and digestive diseases*, including stress-related diseases such as ulcers and cirrhosis of the liver. Finally, there has also been a sharp percentage increase from very low levels in the mortality due to the *diseases of poverty* (that is, infectious, nutritionally related, and parasitic and sexually transmitted diseases). While very pronounced in relative terms, this rise was almost negligible in absolute terms. The problems faced in this area are underscored by the steady rise in the number of cases of diphtheria, tuberculosis and – later on – HIV-AIDS. This is possibly explained by the emergence of an underclass of marginal (vagrants, intravenous drug users and commercial sex workers) unreached by public health systems. Yet, as this rise took place from a very low level, their rise – if worrying - explains little of the aggregate mortality rise.

Population Groups Affected

A priori, one might have plausibly surmised that the transition dislocations would have affected most the biologically vulnerable groups that is children, pregnant women, the elderly and the disabled. In reality, the mortality crisis affected other social groups, namely:

Gender: In most countries and for all age groups, men have been far more affected than women have. Indeed, where death rates have soared, the transition has exacerbated an already high gender mortality gap. In Russia, for instance the female-male LEB gap rose between 1989 and 2014 from 10.3 to 11.2 years (Transmonee 2017). In contrast, in countries where

death rates have fallen, the gender mortality gap narrowed. For instance, in the Czech Republic the female-male LEB gap dropped over 1989-2014 from 7.3 to 5.9 years (*ibid*). The production of specific hormones, testosterone in particular, seems to provide women with greater protection against stress-related mortality. In addition, women generally depend on a more diversified portfolio of activities and social relations, which shelter them from the anxiety and dejection experienced by men during periods of rising unemployment, loss of social status, inability to provide for one's own dependents and deteriorating family life.

Age groups: the most rapid *relative* upswing in mortality rates over 1989-1994 and 1998-2005, and the drop since 2005, was recorded for the 20-39 age group (which had been affected mostly by a rise in external causes of death), while the most rapid *absolute* increase was observed for the 40-59 age group (which was mainly hit by a rise in cardiovascular deaths). For people above 60 years of age, and even more so for those above 70, there has been only a small increase or even a decline in mortality (Cornia and Paniccià, 2000). Likewise, infant and child mortality rates have declined everywhere (Transmonee 2017).

Level of education: Previous studies have documented the steep mortality gradient existing among people with different levels of education. Higher education allows individuals to acquire and process more easily new types of information than people with low education, an essential advantage during periods of rapid transformation. Higher education favours also greater employment mobility, a better management of limited financial resources, and a prudent screening of the risks connected with smoking, taking drugs and excessive drinking. *Ceteris paribus*, a rise in overall mortality was therefore expected to affect disproportionately the people with a low education. Nevertheless, the reality has been grimmer than the prediction as mortality differentials by level of education widened during the transition. Shkolnikov et al. (1998), for instance, showed that in Russia the temporary life expectancy gap between the best and least educated men and women in the 20-69 age group rose from 1.63 and 1.44 in 1988-89 to 1.89 and 1.75 in 1993-94. And Shkolnikov et al (2006) shows that the life expectancy differentials at age 40 between people with high and low education hardly changed over 1988 and 1998 in the Czech Republic while it rose in Russia and Estonia from 5.14 to 10.21 years and from 3.30 to 8.97 years.

Marital status: the rise in death rates hit disproportionately a growing number of people living alone. A drop in nuptiality and – in the Slavic countries of the former Soviet Union – a rise in divorce rates, raised the number of adults living alone. This phenomenon was exacerbated by the surge in the number of widows and widowers due to the initial (1992-95) and subsequent (1998-2003) surge in adult male mortality, and to a lesser extent female mortality, that raised the number of widows and widowers. It was also due the huge declines in the crude marriage rates and – in the Slavic countries of the former Soviet Union – to a rise in the general divorce rate.

Migrant vs. settled populations: Migrants, especially distress migrants, normally face a higher risk of mortality than people who have remained in their communities. The impact on aggregate mortality of this phenomenon likely rose in intensity, as domestic and international migrations skyrocketed in the region following the breakdown of states, the return of troops posted abroad, the inflow of refugees fleeing ethnic strife, industrial restructuring and unemployment.

Place of residence: In most of the region, mortality rates have historically been higher in rural than urban areas. Since 1990-92, however, this tendency started to be reversed, probably because of greater unemployment, stress and crime in cities, particularly in mono-industrial cities affected by the collapse of dominant state factories (Milanovic, 1996) and because of an increase in the number of deaths among vagrant rural residents who moved to towns after the abolition of residence permits and the liberalization of internal migration. In Russia, for instance, the rural- urban LEB difference decreased from 2.4 to 0.8 years between 1992 and 1994 due to a faster rise in urban mortality rates linked to violent causes and cardiovascular problems (Shkolnikov and Cornia, 2000).

Ethnic origin: Mortality appears to have risen more rapidly among certain ethnic groups. For instance, Krumins and Usackis (2000) showed that before the transition the standardized death rate in Latvia was 10 per cent higher among ethnic Russian males than among ethnic Latvians. Such differential rate rose to 17 per cent in the mid-1990s.⁵ Similarly, in the Czech Republic, Dzúrová (1996) found a high correlation among cross-district mortality, ethnic heterogeneity and the proportion of the population of Romany origin. Jozan (1997) reports similar results for Romania and Hungary. It is unclear, however, whether these differentials would still hold after controlling for level of education and skills, unemployment and so on. In addition, Shkolnikov and Cerviakov (2000) find that in Udmurtia (Russia), the mortality among 20-59 years old males was higher among the Udmurt population than among people of Slavic and Tatar origins, but were unable to conclude whether this depended on genetic or socio-economic factors.

Employment status: Finally, mortality grew faster among the unemployed, people with part time jobs, handicap pensioners and people affected by fast labour turnover. This point is discussed further in the next section.

In conclusion, the evidence suggests that the transitional mortality crisis mainly affected an underclass of young and middle-aged men – and to a lower degree women – with low education and skills, an unfavourable labour market status, living in poverty (that affected their psychological status and their alcohol consumption), inhabiting in or migrating to urban areas, living alone, having been detained in the past by the police for more than three days, and with migrant or ethnic minority backgrounds. The detailed retrospective case-control study conducted in 1999 on about 500 men of 20-55 years of age in the Udmurt republic of the Russian Federation confirms that the victims of the transition had such a social profile (Shkolnikov and Chervyakov 2000, Shkolnikov et al. 2004).

⁵ These results may, however, also reflect the changing perceptions of ‘ethnic identity’ among individuals following the independence of Latvia.

Underlying causes of the mortality increase ⁶

Several hypotheses have been put forward to explain the increase in transition mortality. Some have shown their limited relevance and are no longer the object of discussion. They are briefly mentioned hereafter for completeness. Others emphasized factors that do not require a policy response either because the problem does not exist, or because it stems from past problems the influence of which can no longer be offset.

Explanations of no or limited relevance

Glasnost in statistics. According to this explanation, a large part of the mortality rise was due to changes in statistical conventions and greater transparency. It is well known that the former communist authorities deliberately misclassified the number of deaths due to alcoholism and violent causes. Yet, the removal of this distortion hardly affected the global mortality picture. Second, the pattern of mortality changes observed in the 1990s throughout the region was uniform, a fact it is hard to attribute to the coordinated falsification by many independent statistical agencies. Third, detailed investigations of death statistics indicate that for several decades their quality and coverage were – with few exceptions – of standards similar to those of Western countries (Anderson and Silver, 1990). The new mortality data could also have been affected by changes in statistical conventions (as for the measurement of infant mortality), disease classifications and the boundaries of administrative units. However, an examination of the data (Cornia and Paniccìa, 2000) showed that these changes explained only small variations in mortality for narrow subpopulations, but not the rise in the total number of deaths or its persistence after the changes in definitions were introduced.

Ecocide. This argument holds that the mortality crisis was largely due to the current and lagged impact of the environmental neglect prevalent for years in the region. During the socialist era, acute environmental problems did, in fact, lead to a higher incidence of deaths due to bronchitis, pneumonia, influenza, some types of neoplasm, and genetic disorders than in other countries at the same level of industrialization. Yet, ecocide cannot explain the transitional mortality crisis as during the initial phase of the reforms, emissions of harmful substances declined sharply in line with a contraction in industrial production and the adoption of more efficient and less polluting technologies. In Russia, for instance, the emission of harmful substances into the air dropped from 34 million tons in 1990 to 21 million tons in 1995-96 (Goskomstat, various years). The irrelevance of this explanation is confirmed by the steady decline of mortality due to respiratory diseases among children (Transmonee 2017), the elderly and the overall population.

Cohort effects. The mortality crisis in Russia and Ukraine cannot be explained either by the delayed consequences of the debilitation experienced by people born during the 1929-34 famine and World War II. Indeed, an analysis of cohort mortality in Ukraine over 1965-94 concluded that the male war birth cohort experienced higher mortality in the 1990s than the

⁶Schiering et al (2018) reviewed 39 cross-national multi-variable peer-reviewed studies on the causes of the transition mortality crisis in Eastern Europe and the Former Soviet Union. They found that inequality, unemployment, social subsidies, lack of democracy, poor economic performance and religious composition were the leading factors explaining the observed mortality outcomes. At the same time, the studies reviewed failed to establish a connection between mortality and diet, drinking patterns, liberalisation, trust, health expenditure and war. Such results coincide to a great extent with those reported below.

adjacent cohorts, but also that this was not enough to explain the overall increase in mortality since 1989 (Godek, 1997). A similar analysis for Russia (Blum, Avdeev and Zakharov, 1997) shows that the three-year cohort born during the difficult 1942-44 period experienced an increase of 16 per cent in the risk of dying in the 1990s in relation to the adjacent cohorts. Similarly, the cohorts born between 1933 and 1934 experienced a 9 per cent higher risk of dying in relation to the cohorts born in 1931-32. However, the share of deaths explained by the 'debilitation hypothesis' is not too important, as the overall increase in death rates over 1991-94 among males aged 40-50 and 50-60 years exceeded 75 per cent. Second, the percentage increase in death rates during the transition was much higher among the 20-40 year olds, that is, cohorts born during a period of relative prosperity. Third, women born during World War II and 1929-33 should have also suffered higher risks of death later in life, a fact only partially borne out by the data for the 1990s. Fourth, during the transition, the rise in mortality also affected areas of the former Soviet Union that had not been affected by the demographic catastrophes of last century. Likewise, in Poland (that was also severely affected during World War II), the mortality rates of cohorts born during the war fell more quickly than did that of the preceding cohorts. Also the '*postponed death hypothesis*' (that suggests that the liberalization of alcohol sales of 1989 lead to an increase in consumption that proved lethal for socially weak groups whose life was saved by Gorbachev's anti-alcohol campaign) does not stand up to scrutiny. A comparison of LEB gains during the anti-alcohol campaign with its rises over 1989-1994 suggests that this hypothesis may explain only a modest part of the surge in deaths over 1989-94 and none of the 2.6 years decline in male LEB that took place over 1998-2003 in the aftermath of the rouble crisis and devaluation and debt default.

Recession, impoverishment and malnutrition. To be sure, the belt-tightening imposed by the transitional recession entailed a drop in food expenditures. Yet, in view of the high food intake prevailing before the transition and of the considerable scope for substituting cheap sources of nutrients for expensive ones, even large drops in consumption expenditures did not seriously exacerbate the risk of death due to undernutrition (Cornia, 1994). The worrying increase in deaths due to infectious and nutrition-related diseases among male adults was caused by reduced access to shelter, poor hygiene and inadequate health care among a class of marginal, vagrants and homeless. Thus, impoverishment and malnutrition may have been a relevant only in very few, poor and isolated parts of Romania, Russia and Ukraine. For Ukraine, Adamets (1997) reports that only 25 deaths due to starvation were recorded in 1995 out of a total of almost 800,000.

Unhealthy lifestyles (poor diet, smoking and drinking). This explanation focuses on causes of death and population groups similar to those affected in the transition economies. However, according to this explanation mortality should have risen slowly – and after a time lag – because of extended exposure to risky health behaviours. In this model, only accidental deaths respond rapidly to an increase in alcohol and drug consumption. In addition, the risk factors mentioned above should have worsened, a fact not always borne out by the evidence discussed below. Furthermore, during the transition, market forces triggered an enhancement in the structure of diets. Changes in relative prices and improvements in trading raised the consumption of vitamins and minerals from fruits and vegetables. Similarly, a rise in the relative prices of meat, milk and dairies reduced intakes of saturated fats, reducing in this way the risk of cholesterol-induced mortality. Mielecka-Kubien and Zatonski (1997) claim that the drop in cardiovascular mortality among Polish men since 1992 was largely driven by a fall of

25 and 60 per cent in the consumption of animal fat and butter. Likewise, over 1989-95, tobacco consumption appears to have slightly declined or stabilized at a high level throughout the region, as incomes dropped, the prices of imported cigarettes soared and educational efforts started producing an effect. In any case, as noted, death rates due to lung and other types of cancer rose along a slow stable trend, seem to be little related to recent changes in smoking prevalence and cannot explain the rapid surge in circulatory and violent deaths.

Relevant but incomplete explanations

These studies emphasize that contemporary, as opposed to past factors, explain most of the post-1989 mortality changes. They thus generally agree with the findings of Cornia and Panicià (2000), who show that 5.3 years of the 6.6 years loss in male life expectancy observed in Russia between 1989 and 1994 could be attributed to current effects while lagged effects accounted for only 1.3 years.

Weakening of the health care systems. Since the onset of the transition, most Central European countries increased public health expenditures per capita and made greater use of modern drugs such as beta-blockers that reduced the incidence of cardiovascular deaths. For instance, in the Czech Republic the decline in cardiovascular mortality among middle- and old-age people coincided with a surge in public health expenditure from five to 7.4 per cent of GDP between 1990 and 2004 (Rychtarikova 2004). These higher allocations fostered an increase in the number of heart interventions and improved the overall quality of public health. In contrast, countries such as Russia, Ukraine, Latvia and Lithuania experienced a fall in health expenditures per capita of between 15 and 30 per cent during the initial phase of the transition and stagnation since then. This gap has been in part reduced over time, and World Bank WDI data for 2015 show that the ratio Public Health Expenditure/GDP ranged between 4.5 and 6 per cent in Central Europe versus 2.9 in Ukraine and 3.4 per cent in Russia.

In Russia and other CIS countries, the rise in the number of deaths for curable diseases among hospitalized patients, and the temporary breakdown of vaccination systems in the early 1990s (Shkolnikov and Cornia, 2000) suggests that cuts in public expenditure played a role in the early years of the crisis. According to some estimates, one fifth to one quarter of the LEB gap between Russia and Western Europe could be attributed to deaths from amenable diseases.

Yet, reduced access to and declining quality of health services and its subsequent slower increase cannot explain why mortality rose faster among men than women and why it surged only for a few diseases, but not for others such as cancer, respiratory diseases and neonatal and perinatal problems. Finally, it cannot explain the jump in the number of non-amenable causes of death such as strokes and violent deaths, that is, deaths that accounted for an important share of the total increase in mortality. Indeed, as shown in Figure 5, the relation between health spending per capita (and indirectly health spending/GDP) and LEB is concave.

Figure 5. Relation between health spending per capita and LEB, 1970-2015



Source: Roser M. (2017) Note: Health expenditure per capita is measured in 2010 international dollars. As one can see, despite a very high and mounting health spending, the USA has achieved a LEB lower than that of the Western European countries and the Czech Republic.

While an initial growth in health spending per capita generates a rapid increase in LEB, beyond a threshold of around 2000 international 2010 \$, the gains in LEB are modest and likely to depend mainly on other factors discussed later on such as unemployment, the distribution of income and health spending, family arrangements, social cohesion, and so on.

Relevant explanations

Mounting alcohol consumption. Official data suggested that in the past national sales statistics covered less than 50 per cent of real consumption (Trembl, 1997). Alcohol intake during the transition was thus estimated indirectly based on the increases in alcohol-related deaths, that is, deaths due to alcohol poisoning and psychosis, suicide, accidents and other violent deaths, upper digestive tract cancers, chronic liver diseases, and cirrhosis. Such approach may however lead to an overestimation of the impact of alcohol consumption as some of these deaths (such as those due to suicide, accidents and other violent causes) may occur also in the absence of a high alcohol consumption).

This and other indirect methods⁷ suggest that alcohol consumption rose perceptibly in several economies in transition. In Russia, indirect estimates by Shkolnikov and Nemtsov (1997) showed that average alcohol intake jumped from 11.8 litres per capita in 1989 to 14.5 litres in 1993 and that this increase contributed to a rise in accidental deaths. Likewise, in Poland, per capita consumption rose from 8 to 11 litres between 1988 and 1991, and fluctuated around that level over the subsequent five years. These estimates allowed Moskalewicz et al. (2000) to conclude that 32 per cent of the overall surge in male mortality in Russia over 1990-94 can be tentatively attributed to greater alcohol consumption and that the equivalent figures for Lithuania (1990-94) and Poland (1989-91) were 40 and 27 per cent. Given the fragility of the alcohol consumption estimate, these conclusions have to be taken with a pinch of salt.

⁷ See Shkolnikov and Nemtsov (1997).

A key issue in this debate concerns the causes of the increase in alcohol consumption (Paniccià, 1997). Possible explanations include: trend inertia reflecting deeply rooted consumption habits; changes in incomes and the relative prices of alcohol⁸; a relaxation of the anti-alcohol policy during the transition; and psychosocial stress.

However, the 'alcohol hypothesis' does not explain why alcohol related-mortality fell during the successful transition of the Czech Republic throughout the transition and in Poland since 1992, while alcohol consumption remained constant. Similarly, in the 2000s the number of alcohol-related deaths fell in Russia and the Baltics, where there is no evidence of a drop in alcohol intake, though this might have been accompanied by a drop in the consumption of hard liquors and a rise in that of beer and wine. Moreover, it cannot explain the huge rise – and subsequent fall – in cardiovascular and other deaths that, while related to stress, are not mediated by alcohol intake. Moreover, in Russia during some periods per capita alcohol consumption and death rates moved in opposite directions – in 2002-07, deaths from external causes, including murders, suicides, and poisoning, fell alongside rising alcohol consumption.

Subsequent analyses have focused on the way alcohol is consumed. While in Mediterranean countries important amounts of alcohol are consumed every day, mainly with meals, in Russia, Belarus, Ukraine and the Baltics the same weekly amount is likely to be consumed on a single occasion, a drinking pattern termed binge drinking. Some research suggests that the latter is causally associated with cardiovascular death. However, a study of 25,000 autopsies carried out in Barnaul (Siberia) over 1990-2004 suggests that 21 per cent of adult male deaths attributed to circulatory diseases induced by alcohol consumption were caused by alcohol poisoning, i.e. lethal or near-lethal levels of ethanol concentration in the blood (Brainheartd and Cutler 2005) . Finally, the 'alcohol hypothesis' cannot fully explain the huge rise—and subsequent fall—in cardiovascular and other deaths which, while related to stress, are only in part mediated by alcohol intake.

⁸ In Russia, for instance, the alcohol purchasing power of wages rose by 48 per cent between 1989 and 1993 because of a drop in the price of alcohol greater than that in the average wage. However, a study by Denisova (2010), based on twelve rounds of the Russian Longitudinal Monitoring Survey covering the years 1994-2007 found that while social status, labour market behaviour, sectoral and occupational mobility, and smoking and alcohol consumption had a strong effect on longevity, there was no evidence that the low relative price of vodka led to greater alcohol consumption. Likewise, the meta-analysis of 39 studies on the determinants of the transition mortality crisis Schiering et al., (2018) found no evidence that alcohol consumption and drinking patterns were consistently associated with higher death rates, while Popov (2018) presents several other reasons why an increase in alcohol intake fails to provide a consistent explanation of the transition mortality crisis. Finally, Razvodovsky (2016) analyzed trends in sex-specific suicide rates and alcohol sales per capita from 1980 to 2010 in Russia, Belarus and Ukraine by means of a Spearman's rank-order correlation analysis. The estimates based on the Soviet period suggest a strong association between alcohol sales and suicide rates in Russia, Belarus, and Ukraine. At the same time, the relationship between alcohol sales and suicide rates was negative in the post-Soviet period. The author concludes also that alcohol can not fully explain the fluctuations in the suicide mortality observed in these countries during the Soviet period. The similar regional pattern of suicide trends does not support the hypothesis that alcohol control policy was responsible for the decline in Russian suicide mortality during the recent decade.

Overall, alcohol has likely been an associated factor in 27-40 per cent of the rise in male mortality and in a smaller proportion of female mortality, but fails to explain two thirds of the rise in male mortality and over nine tenths of that in female mortality. The main cause of this epochal disaster must therefore still be sought elsewhere.

Acute psychosocial stress. Acute psychosocial stress has been increasingly recognized as a key factor in sudden deaths, that is, deaths due to heart problems and hypertension, alcohol psychosis, neurosis, homicide, suicide, accidental deaths, ulcers and cirrhosis of the liver that is the very causes of death that rose in importance during the transition. According to Serafino (1994, cited in Shapiro, 1994):

“Stress is the condition that results when person/environment transactions lead the individual to perceive a discrepancy – whether real or not – between the demands of the situation and resources of the person’s biological, psychological or social systems.”

Deaths due to acute psychosocial stress thus entail growing strain and pressures to adapt to unexpected situations for which established individual responses are no longer effective, appropriate coping behaviours are unknown, and the public policy response is inadequate.

Epidemiological research has shown that, in the absence of mitigating factors, acute stress leads to physiological and psychological arousal that affects health status via direct and indirect pathways. Marmot and Bobak (2000) have reviewed the *direct effects* of stress. They found that stressful situations cause a higher secretion of cortisol, endorphins, platelets, fibrinogens and fibrinolysis, that is, substances that affect the level of plasma lipids, blood coagulability, blood pressure, cardiovascular reactivity, the development of central obesity, responses to inflammation or infection, and the risk of depression. Chronic exposure to stress has also been found to cause coronary artery atherogenesis and to affect the immune system through a significant suppression of T-cell immune response. Finally, psychosocial stress has been shown to provoke an *indirect effect* on health via the increased use of stress-relievers such as alcohol, tobacco and drugs, which influence health and social behaviours, as well as the ability to maintain emotional balance and coherent compartment.⁹

Which have been the main socio-economic sources of stress during the transition? The first was an unexpected rise in unemployment, employment instability and rapid labour turnover. Mortality rose most in countries, districts and years that recorded adverse labor market changes starting with a rise in ‘unexpected unattended unemployment’ and in other adverse labour market changes (Cornia and Panicià, 2000). This confirms the results of controlled studies carried out in industrialized countries on factory closures and significant lay-offs and follow-up studies on unemployment, that is, studies that replicate quasi-experimental conditions. These have shown that the sudden loss of employment and similar events are a major cause of stress, cardiovascular and mental problems and death (Beale and Nethercott, 1985; Warr, 1987; Martikainen and Valkonen, 1996). These studies have provided evidence of higher mortality for accidents and violence, alcohol-related diseases, traffic accidents, and circulatory diseases among the unemployed (Smith, 1992). Grouped data for the economies in

⁹ The health impact of stress varies considerably, however, from one person to another due to genetic differences and differences in individual abilities to adjust to new situations.

transition (Cornia and Panicià, 2000) confirms the existence of a strong correlation between the rise in unemployment and other adverse labour market changes and mortality changes in Czech Republic, Russia, Latvia, the former GDR and Poland.

A specific pathway through which adverse labour market changes emerged in the transition economies concerns the approach followed to privatization of state owned enterprises. A study based on Russian micro-level data by Azarova et al. (2017) uses enterprise and settlement-level data to enable a comprehensive analysis of both underlying and proximate causes of mortality in mono-industrial towns. This retrospective cohort study compares mortality in 10 fast-privatized factories with that in 10 slow-privatized ones. It found that fast privatization - that is often associated to factory closures and asset stripping - raised workers mortality by 13 to 21 per cent (depending on the model specification used) in relation to the slow-privatization, after controlling for alcoholism, smoking, age, marital status and financial deprivation. While in Soviet times SOEs hoarded labour, resisting massive layoffs in slow-privatizing SOEs possibly reduced the stress related to sudden unemployment. Being employed, even nominally, provided people with minimal security and gave them the feeling of being in control of their lives. Likewise, before being privatized SOEs offered a wide range of social benefits to employees and their families in the form of housing, health care, day care, and holiday recreation. When these enterprises were privatized, such benefits ended abruptly (in case of fast privatization) or more gradually (in the case of slow privatization), giving workers the time to adjust to the new circumstances. Municipal authorities were often charged with taking responsibilities for these services but, due to serious financing problems, were unable to fulfill adequately such new obligations.

Through which pathways does unemployment affect health? The most obvious effect is that mediated by the loss of income. Unemployment, however, affects people also in several other ways. Indeed, unemployment generates a loss of skills, cognitive abilities, motivation, and sense of confidence and control (Sen, 1997). Unemployment can also be a source of psychological harm because of the loss of self-respect, feelings of being unwanted, unproductive, dependent and without a social role, and rising anxiety about the future. Unemployment may also erode social norms and cause an increase in crime rates among the jobless. While material deprivation plays a role in the increase in crime, so does the greater sense of exclusion felt by the jobless. Finally, loss of employment disrupts family and social relations and is associated with mounting alcohol consumption and family violence (ibid.). There is also evidence that the impact of joblessness is related to the expectations of becoming unemployed. Indeed, the impact seems to be greater among workers who were permanently employed and had no expectation of being laid off, as it happened in many transition countries. It is moderate among workers whose fixed-term contracts are expiring and minimal among those who had never been employed who continue to be unemployed (Björklund and Eriksson, 1995).

Growing undeserved income and asset inequality, i.e. inequality unrelated to differences in talent, effort, and human capital. Previous analyses on market economies have emphasized the negative correlation between income concentration and health outcomes (Wilkinson 1996, Kawachi et al. 1999; Pickett and Wilkinson, 2010). Unequal societies are also afflicted by a high incidence of cardiovascular problems caused by low involvement in community life. Rising income and asset inequality may erode social cohesion, that is, the relations of

interpersonal trust, mutual insurance, collective action and redistribution at the local level. Social cohesion enhances health status by promoting the diffusion of health information, exerting control over deviant health behaviour and criminal activity and providing interpersonal help among community members. Finally, health status in an unequal society is also influenced through psychosocial pathways. Strongly hierarchical societies appear to be subject to a high incidence of cardiovascular problems, less social integration, less involvement in community life and greater personal isolation – that is an important cause of morbidity and mortality.

Several of these effects have occurred in the countries in transition exhibiting rapid rises in social stratification. On one hand, the economies of Central Europe experienced moderate initial increases (4-6 Gini points) in income inequality (Cornia, 2004). These countries contained the fall in the tax/GDP ratio and were thus able to continue financing the social services and benefits inherited from the socialist era and to introduce new provisions (for unemployment compensation and social assistance) that are needed in a market economy. On the other hand, in the former Soviet Union and Southeastern Europe, the Gini coefficients rose by an astounding 10-20 points, that of the asset distribution by even more, social transfers collapsed and the targeting of transfers deteriorated (Cornia, 2001). As a result, in 2014, the Gini coefficient of the distribution of gross income/c was 25-27 in Central Europe but Poland, and 35-41.6 in Southeastern Europe, the Baltics and Russia (WIDER 2018).

Third, these distributive changes placed a heavy psychological burden on the losers, namely, middle-aged, unemployed, semi-skilled industrial workers, collective farmers and party cadres. As the new elites often reached their positions through ascription, capture of state assets and corruption, the losers experienced rage, hostility, humiliation, lack of recognition and unwontedness. Disorientation was acute also among the elderly and middle-aged adults who saw the values, norms and savings of their lifetimes vanish.

A growing numbers of people living alone. At all ages, stress-related mortality is higher among people (men in particular) who are widowed, divorced, separated, or who never married than among those who live in a stable partnership (Martikainen, 1995). The latter presumably lead healthier lifestyles are less exposed to stress and have greater access to support networks than people living alone have. This regularity was confirmed during the transition, as the percentage of widows and widowers in the adult population rose, the crude marriage rate fell by between 16 to 54 per cent, and the divorce rate edged up until the early 2000s by 10-15 per cent in Russia, Ukraine, Belarus, and Moldova, the very countries which experienced the most pronounced mortality rises. While even large annual shifts in these rates affect modestly the percentage of people living alone in the total, a continuation of this trend for a decade raised perceptibly the number of single adults who faced higher health risks. In addition, the unmarried-married mortality differential widened further during the transition, contributing in this way to a rise in aggregate mortality. For instance, even in the Czech Republic – which experienced a fall in death rates since 1991 – the risk of death of divorced men relative to married men rose from 2.03 in 1990-91 to 2.27 in 1995 (Dzurova 2001).

The number of people living alone rose also because the number of divorces rose over 1989-96 and 2000-2003 (Transmonee 2017). In Russia, the general divorce rate rose from 42.1 to 73.2 per 100 marriages in 2003, the year that recorded the highest number of excess deaths

(Table 8, Annex Table 1). Moreover, Pridemore and Shkolnikov (2004) found that in Russia homicide mortality was 2.86 times higher among divorced than married people, and 9.3 times higher among divorced people with low education versus married people with high education.

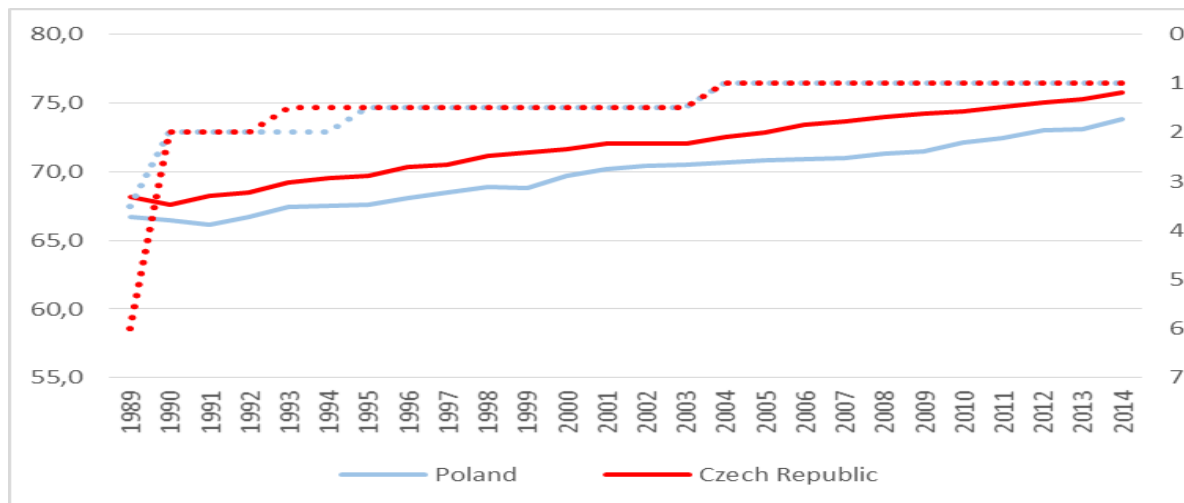
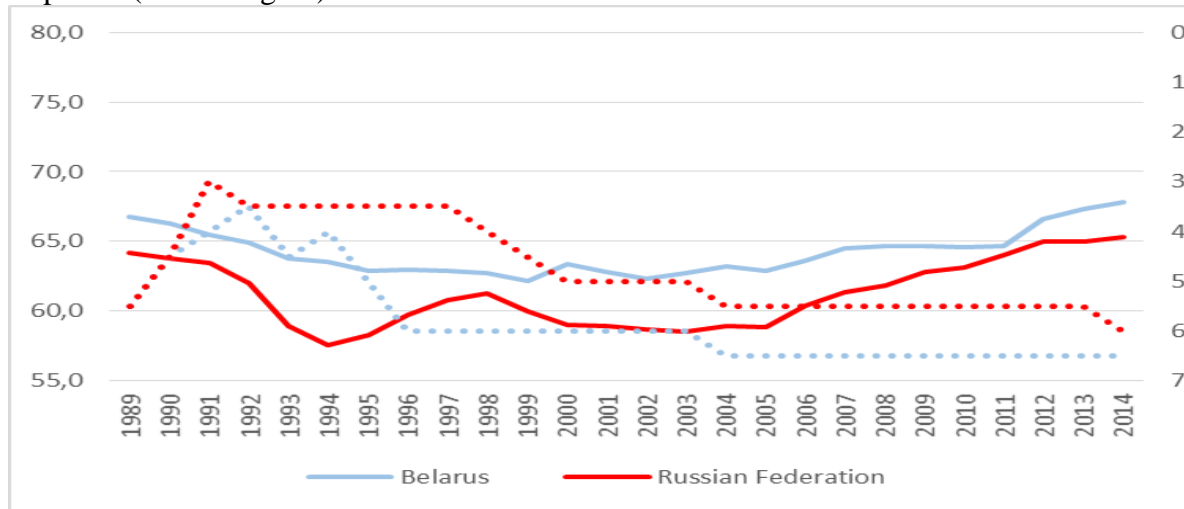
Distress migration. Previous analyses have shown that migrants face greater mortality risks than people who remain in their communities (Eyer and Sterling, 1977). Such finding was confirmed during the transition as, since 1989, at least nine million people moved within or between the countries of the CIS alone seeking work, fleeing conflicts, as political refugees, or returning from abroad. For many of them, migration, entailed considerable material hardship, disorientation and loss of control due to the difficulties encountered in new environments, the breakdown in social relationships, the redefinition of survival strategies, housing problems and, as a result of all this, greater stress and, at times, homelessness. For instance, in 1991-92, Czech people living in their birthplaces had a considerably lower probability of dying than did people who had migrated there recently (Dzúrová, 1996).

Limited political democratization. A limitation of the above analysis concerns the explanation of the huge differences in country policy responses to prevent and respond to the mortality crisis. There is a need therefore to develop an accepted theory of why such responses differed so much. For instance, despite its magnitude, the mortality crisis in CIS countries was broadly neglected by national authorities, especially during the early years of the transition. Indeed, the mortality data and the analyses of the health crisis carried out by demographers and social scientists of these countries generated a limited response by several incumbent governments, a fact that may raise questions about the degree of democratization and social concern in a number of countries. The fact that the crisis hit most marginal groups with no ability to organize politically and no ‘political voice’ possibly reduced their electoral and political pressure on the incumbent governments. Thus, the 16 million excess deaths recorded in Russia, Ukraine, Moldova and Belarus between 1990 and 2014 still lack a comprehensive theorization.

Plotting the trends of LEB and the Freedom House Index of democracy¹⁰ for Russia and Belarus (Figure 6, top panel) shows that there is a fairly close correlation (at least until 2005) between the worsening of the Freedom House Index (FHI) since 1992 and male LEB. These two countries experienced a fall in LEB until 2005 in parallel with a decline in the FHI. In contrast, a similar scatterplot for Poland and the Czech Republic (Figure 6, bottom panel) confirms the close statistical association between the trend in LEB and such index. Indeed, in both these countries, these two variables improved, hand in hand, throughout the period analysed.

¹⁰The yearly values of the Freedom House Index of democracy (<https://freedomhouse.org/report/methodology-freedom-world-2018>) summarize the subjective values assigned by experts to 10 political rights areas (grouped into three subgroups covering the electoral process, political participation and pluralism, and functioning of the government) and 15 civil liberties covering the freedom of expression and belief; associational rights, rule of law, and personal autonomy and individual rights. Such different aspects of democracy are then summarized by means of the arithmetic mean, that ranges between 0 (perfect overall democracy) and 7 (total absence of it).

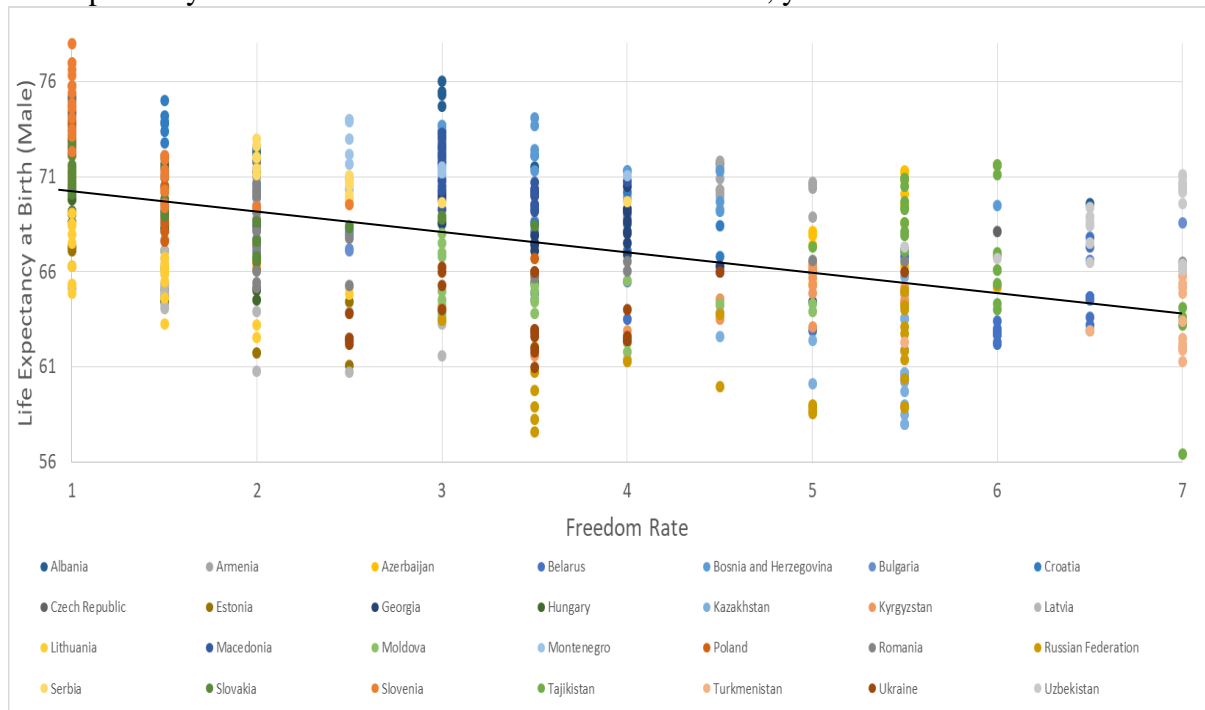
Figure 6. Evolution of male LEB (left scale, solid line) and the Freedom House democracy index (right scale, dotted line) in Belarus and Russia (top figure) and Poland and the Czech Republic (bottom figure).



Source: own elaboration on Transmonee 2017 and the Freedom House Index.

The same relation has also been plotted for all European economies in transition over 1989 and 2014 (Figure 7). Also in this case, it appears that the two variables are closely correlated. On the basis of Figure 8 – and pending a more detailed investigation taking care of the problems of endogeneity and variables specification – it appears that countries that introduced truly democratic institutions (scores 1 and 2) enjoy a male LEB 7-8 years higher than the countries with a low score.

Figure 7. Scatterplot of the relation between the Freedom House Index (x axis) and male life expectancy at birth for all transition countries with data, years 1989.2014



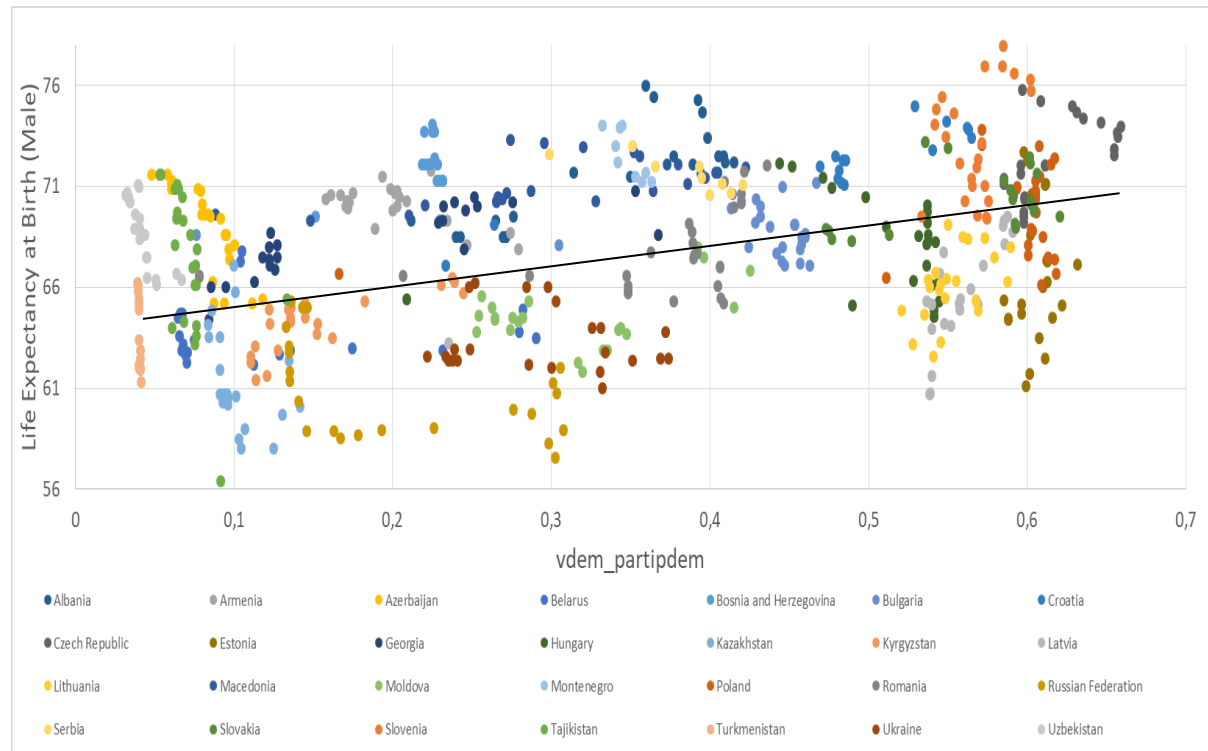
Source: own elaboration on data from Freedom House (2018) and Transmonee (2017)

Because of the criticism that has often been addressed to the Freedom House Index, and of the problems posed by the general practice of measuring democracy through ‘electoral democracy’, in which authority is delegated to representatives, the relation between ‘democracy’ and male LEB was also tested using an alternative indicator that emphasizes ‘participatory democracy’, such as the ‘vdem partidem’ measure of democracy. Such index is extracted from the website ‘Varieties of democracy V-Dem’(<https://www.v-dem.net/en/data/data-version-8/>) and is the average of three components: (i) the first is a ‘pparticipatory component index’ that emphasizes the active participation by citizens in all political processes, electoral and non-electoral. This index takes suffrage for granted, but emphasizes in addition engagement in civil society organizations, direct democracy, and the election of subnational bodies. It includes also (ii) a (fairly similar) ‘Participatory democracy components’ that emphasizes active participation by citizens in all political processes. To make it a measure of participatory democracy, the index also takes the level of electoral democracy into account. It finally includes a (iii) Political Participation Rights component that measures the extent a country enacts political participation rights by law and respects them in practice. The overall index varies between 0 (no participatory democracy) and 1.0 (when participatory democracy and participatory rights are fully realized)

As shown in Figure 8, such index identifies very different situations of ‘participatory democracy’. Some countries (such as Uzbekistan, Turkmenistan and Belarus) have very low scores of 0.1-0.2 and others (especially in Central Europe) scores of up to 0.65. Russia’s score ranges between 0.27 and 0.32, depending on the year, Ukraine of 0.48-0.52, and the Baltics of between 0.55 and 0.59. Also, in this case the differential of male LEB between the

best and worst performers in term of participatory democracy is of about 6-7 years. And also in this case, a considerable amount of variance remains – as expected – unexplained.

Figure 8 Scatterplot of the relation between the Participatory Democracy index (horizontal axis) and male life expectancy at birth for all transition countries and years with data, 1989-2014

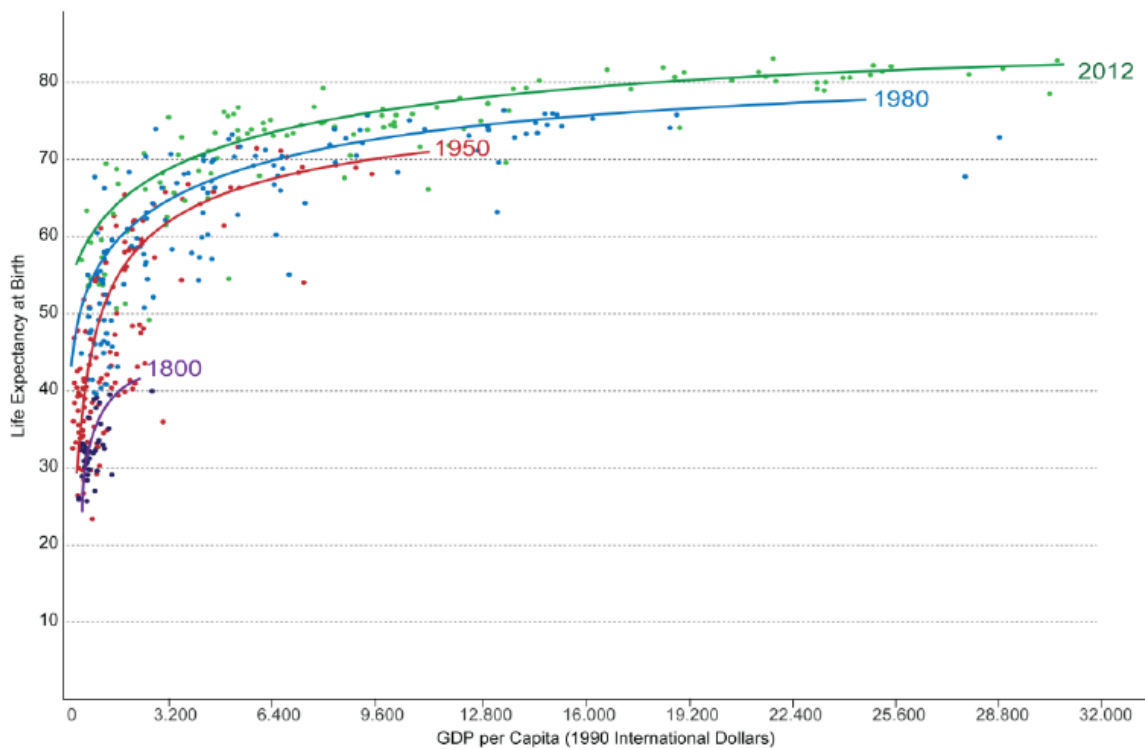


Source: own elaboration using the index of participatory democracy ‘partidem’ and Transmonees (2017)

There seem therefore to be a fairly solid empirical association between democracy and participatory democracy on the one side, and male LEB on the other. Beyond differences in ‘initial distortions’ (and the consequent extent of the transformational recession and fall of GDP per capita) and other path-dependent factors, the depth and nature of democracy thus helps explaining the different national policy responses to the transitional mortality crisis and – in the end - the losses/gains in male LEB.

The relation between participatory democracy and male LEB is tested econometrically hereafter over the years 1990-.2014 for the 21 countries included in Table 8 after introducing as control the yearly GDP/capita in a quadratic form. Indeed, the impact of GDP per capita on male LEB is highly concave (see Figure 11), as its effect is strong at the beginning, to decline after about 6400 1990 International dollars. This relation – known as ‘the Preston Curve’ from the name of the demographer Samuel Preston who first described it in 1975 - suggests that GDP/capita should be introduced in a nonlinear form. Furthermore, an analysis of the scatterplot suggests that the impact of GDP/capita on male LEB was particularly pronounced over the year 1989-2002, and for this reason we introduced a 1989-2002 period dummy that turns out to be highly significant in regression.

Figure 9. Life expectancy versus GDP per capita in 1990 international dollars from 1800 to 2012.



Source: Roser (2018)

The results of the econometric test are reported in Table 9 that shows that, after introducing as control the GDP/capita (that has the right sign and is statistically significant at the 1 per cent level) as well as the period dummy 1989-2002 (that is equally statistically significant and with the expected sign), the variable *partidem* is statistically significant at the 5 per cent probability level, while the R2 is high (0.9). An increase of *partidem* by 0.1 points would raise – *ceteris paribus* - life expectancy by about 0.2 years. For instance, if Russia current *partidem* score (about 0.3) rose to that of the Czech Republic(0.65), her male LEB would improve by about 0.7 years. If the analysis were conducted for years prior to 2002 the favourable effect on male LEB would have exceeded 2 years. The level of participatory democracy has therefore influenced in a non-negligible way male LEB, especially for the initial transition years. Of course, the other variables discussed above concur in explaining the large cross-country male LEB gap observed among the European transition economies.

How can one support theoretically such conclusion? A first argument has to do with asset and income inequality. To start with, in the 1990s all European countries in transition (but the Central Asian ones and Belarus) shifted from a uniform model of authoritarian centralism to different shades of ‘western-type democracy’. Yet, in itself, greater “procedural democracy” (that mainly emphasize the voting process) did not by itself help improving human wellbeing and health status, unless “participatory democracy” and “economic democracy” improved in parallel and unless the economic base of the disenfranchised populations did not deteriorate.

Table 9. Regression Results: OLS with country dummies., 1989-2014

	Male LEB
Partipdem	2.097** [1.035]
Gdp/c	0.038*** [0.005]
Gdp/c ²	-0.000*** [0.000]
Period dummy 1990-2002	-1.340*** [0.192]
Constant	71.146*** [0.491]
Country dummies	Yes
Observations	584
R-squared	0.90

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

‘Economic democracy’, in turn, depends on historical path-dependent factors affecting the past and current asset and income distribution. In this regard, the very different models of privatization of state assets followed in the region after the collapse of communism influenced to a large extent the degree of asset concentration in the region, the distribution of political power, and the current level of income inequality. As noted earlier in the paper, the current Gini coefficient of income inequality in Central Europe is some 40 per cent lower than in Russia.

In this regard, the public choice theory suggests that the high-income polarization observed in the several CIS countries led to a divergence in the types of public expenditure demanded by different income groups. In addition, in several of these countries, rising asset concentration strengthened the political ability of the new elites to resist taxation and influence the allocation of public expenditure towards activities (including prestige items and national defence) that were perceived to benefit them the most, while sacrificing public expenditure on public health, education, housing and income support that would have benefited substantially the marginal groups hit by the mortality crisis, but that the elites perceived would bring them only little benefits. Indeed, where asset and income polarization rose, the state provision of educational and health services declined or was privatized, and residential segregation increased. Elite-friendly governments did neglect the health needs of the masses when deciding resource allocation, reducing the prospects of the worst-off and the middle-class for achieving adequate income levels and effective access to public health care. What is observed in the region may therefore confirm the conclusions of the literature that suggests that when asset and income inequality are high, governments and self-interested bureaucracies are likely to implement suboptimal public policies that retard or reduce the provision of essential pro-poor and pro-growth public services. Rising divergence of interests and types of public services demanded by the rich and the poor often lead to an overall drop in the supply of

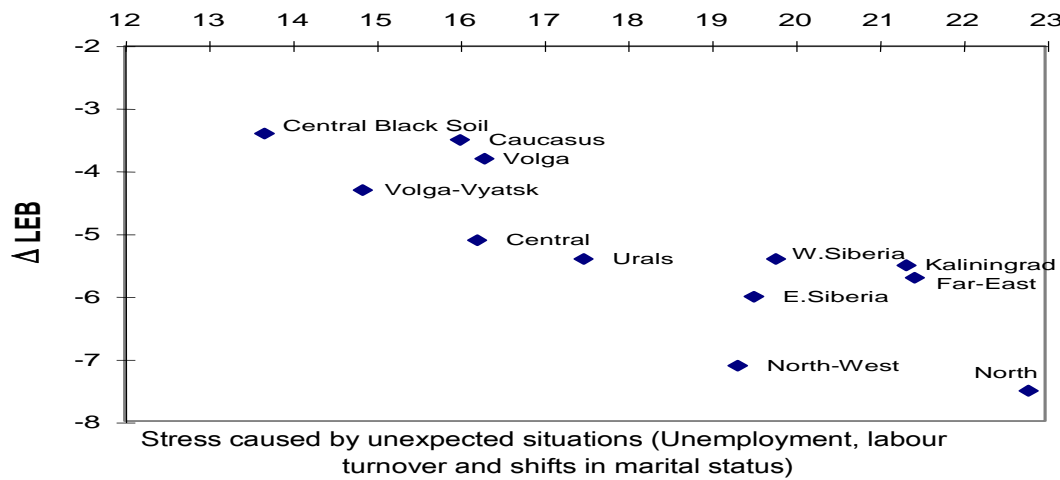
basic public services that are essential for growth, such as personal security, contracts enforcement, and human capital formation.

A second way through which high inequality affect health status is that the “procedural democracy” and formal political freedom typical of polarized societies may not guarantee “political stability” and health-enhancing social cohesion. During the communist period in much of the former Soviet Union, official organizations affiliated to the communist party, such as the pioneers and sport and leisure associations, took the place of the civil society organizations that had developed spontaneously in the West, or that had not disappeared during the communist era, as trade unions and church organizations in Poland, cooperatives in Hungary, or pre-communist institutions (as neighborhood associations such as the *Mahalia*'s of Uzbekistan and similar associations in Armenia). The preponderant role of the communist party and the limited scope for independent self-organization generated a deep-rooted apathy among individuals and led, after the political liberalization and subsequent collapse of the communist party, to the creation of ‘shallow democracies’ which lacked a well-developed network of civil society organisations (associations, NGOs and churches working in the social sphere, trade unions, producers associations and self-governing bodies) for the formation and channelling of political consensus, democracy at the local level, defence of the interest of marginalized populations and active political participation, i.e. all institutions and organizations that would have likely helped to contain the increase in mortality. For instance, a study on Russia (Stuckler et al. 2009) found that every one per cent increase in the share of the population who were members of at least a social organization decreased the associated risk of mortality by 0.27 per cent. When more than 45 per cent of the population surveyed was socially organized, the mortality differential with privatization was no longer there.

Interaction among stressors.

The stress factors described above have often reinforced each other and interacted negatively with greater alcohol consumption and reduced access to health services. For instance, the more rapid than average rise in unemployment recorded between 1992 and 1994 in the northern part of Russia caused a high labour turnover, the spread of an unregulated grey economy, an increase in unemployment-related migration under difficult circumstances and a rise in family breakdowns. All these factors interacted to cause a high level of stress (Figure 10). The northern districts are precisely those which experienced the biggest increases in stress-related deaths. The southern part of Russia was less affected by unemployment, inequality, family instability, and migration. In these areas, the increases in stress and the loss of life expectancy among males were more contained.

Figure 10. Relation between a stress index (summarizing rises in unemployment, labour turnover and number of adults living alone) and year losses of LEB (Δ LEB), 1989-94



Source: Cornia (1996)

While measuring the health impact of these stressors poses considerable methodological and data problems, initial regression analysis carried out on the 12 Russian macro-regions in Figure 10 over 1989-94 suggests that a 20 point increase in the Gini coefficient reduced male LEB by 1.5 years while a 10 points rise in unemployment lowered it by 3.5 years (Cornia 1996). However, an important share of transition mortality remained however unexplained.

In conclusion, the peculiar pattern – by age, gender, education, skill level, labour market status, location, cause of death, time profile and so on – of the mortality crisis of the 1990s and 2000s suggests that the transition mortality upswing in the former Soviet bloc was mainly the result of a poorly managed ‘transformational crisis’ whereby several factors interacted to cause a sharp rise in uncontrolled stress that hit most an underclass of marginal with no ‘voice’. Though with different emphasis, most authors now agree with this explanation. Yet, the formulation of a unified testable causal model is made difficult by the fact that the variables used in this analysis belong to disciplines that adopt different research methods. In addition, for several variables data are available only at the macro or grouped level, while for others (e.g. stress and alcohol consumption) data coverage is patchy. Thus the above conclusions are arrived in several cases based on grouped data that permit only to arrive to a weak causal inference. The impossibility of using micro data, either because unavailable or because some of the relevant variables are of aggregate nature, does not allow therefore to test quantitatively the relative importance of stress and alcohol consumption.

Possible policy responses: mention only

The eruption of a massive transition mortality crisis following the introduction of reforms that were expected *ex-ante* to generate positive economic, social and health effects confirms that poorly managed societal transformations may generate acute deteriorations in the economic

and health sphere. The 35 percent increase in male suicides over 2007-2011 recorded in Greece during the recent years of austerity (that in the view of the EU and IMF was to lead to a rapid economic turnaround) provides another example of the need to adopt measures to control the rise of instability, unexpected job losses, inequality and personal insecurity. Swift policy responses in these areas are needed both for the specific benefits they produce (e.g. better labour market outcomes) as well as because of their positive health impact.

Acceptance of the psychosocial stress explanation has important policy implications. Supporters of 'big bang policy reforms' tend to ignore the social and health impact of such reforms, to ascribe them to problems inherited from the past or to the unavoidable chaos brought about by profound political transformations, and to suggest that there are no quick fixes for such problems. Meanwhile, conservative forces (as the unreformed neo-soviet parties in Russia and Belarus) argue that the mortality crisis has been caused by the sheer impoverishment brought about by the move to the market, and that most liberal reforms (including privatization) should thus be repealed or drastically amended.

The implications of the analyses presented in this paper are substantially different from either of these views: vigorous market reforms are necessary, but – as shown by the case of the Czech Republic and Poland or by the gradual two-track price liberalization followed in China over 1978-84 – they need to be characterized by a realistic pace of industrial restructuring, and privatization, strong labour market and social sector policies, maintenance of law and order, the strengthening of health care, and – to finance all this in a non-inflationary manner – by adequate revenue generation.

A solution of the mortality crisis that has affected the countries of the former Soviet bloc will require vigorous measures to prevent or control transition-related psychosocial stress. Such measures needed under such circumstances include properly paced macroeconomic adjustments, and industrial restructuring, adequate credit and technical assistance policies, job re-training, public works, unemployment compensation, wage subsidies, and measures to contain surges in inequality, social exclusion, family breakdowns and distress migration. Deaths due to violent causes and infectious diseases can also be avoided by strengthening the police and social assistance services dealing with people marginalized by the crisis. A stricter regulation of alcohol consumption and other stress relievers is also needed to reduce violent and cardiovascular deaths. Reversing the negative long-term trend in health status will require also efforts at improving lifestyles, educating people about the risk of smoking, poor diets and excessive drinking, and to strengthen curative health care. Initiatives in this area would have the double advantage of reducing the rise in violent deaths (thanks to better policing, efficient deterrence by the courts and active assistance for and control of the marginal) and of containing overall stress by improving security. Greater regulation of alcohol consumption will also be needed to reduce violent deaths, cirrhosis and throat cancer. This can be accomplished through higher alcohol prices (although the reduction in open demand might be in part offset by increases in home brewing), a reduction in the number of outlets, opening hours and sales to minors (key measures which require strong government commitment) and educational campaigns aiming at modifying drinking behaviour.

3. Conclusions

This paper has argued that:

(i) profound social changes such as those observed on occasion of important political or economic reforms may have unexpected and long-lasting negative effects on the health of large sections of the population. The analysis of past and current cases of social change confirms that the search for political and economic improvements may lead to considerable social dislocations and severe mortality crises over the short and medium term.

(ii) the mortality crises that followed episodes of rapid social change or epochal transitions affected different social classes, though in the majority of the cases the low income groups were the most affected. Among the latter one can include the rural immigrants to cities (as in the case of urbanizing Britain and Sweden), canal workers and low income dwellers exposed to problems of overcrowding, inadequate housing and sanitation (on occasion of the construction of the Panama Canal), and newly unemployed workers with low education, living in incomplete families and from a minority background (in several Eastern European economies in transition), and illiterate cotton farmers (in Andhra Pradesh). In some cases, (as in Panama or South Africa) the crisis affected as well part of the middle and upper class, indicating that while these crises may hit particularly hard the lower strata, the better off groups cannot consider themselves immune from problems. The evidence suggests as well that the stronger the initial stratification, the highest the likelihood that the low-income groups are likely to be affected more than proportionately, leading in this way to a widening of health inequality.

(iii) the mortality crises reviewed in this paper have generally affected two well-defined age-gender groups, i.e. adult males and, at times, children. The studies on Andhra Pradesh, Sweden, South Africa and Eastern Europe show that adult males are especially vulnerable to stress-related mortality, their greater vulnerability being due to differences in behaviours and gender roles rather than biology. The mortality crises hit also some of the biologically vulnerable groups, such as infants and children, especially when the main causes of death were infectious, nutritionally related, respiratory and waterborne diseases.

(iv) There appears to be four broad pathways through which social change may affect adversely health status, i.e.: (a) due to the unexpected effect of political transitions carried out in the absence of adequate administrative, legal and redistributive institutions and a modicum of economic democracy; (b) through increased geographical mobility combined with the inelastic supply of public infrastructure and housing leading to overcrowding, deteriorations in environmental conditions and the rise of infectious and social diseases, (c) via the introduction of economic reforms under conditions of incomplete markets and missing institutions and (d) due to the contact of different pools of disease.

(v) While the pathways through which rapid change impact the mortality for infectious and poverty-related diseases are well known, less is known about the economic and social factors that raise stress levels among populations affected by rapid change. Such factors (such as rising unemployment in Russia, or fear of violence in South Africa) are generally unexpected as they may have never been experienced before, or as people have only generic expectations

about the probability of their occurrence. Unexpected events cannot be insured against or prevented through structural interventions. At time, social change is also sudden, a fact that compresses the response time available to society and communities to introduce counter-measures to offset its impact.

Because of people's inability to prepare for and deal with it, rapid change (even if potentially favourable) can increase the sense of uncertainty about the future, the fear about one's own security, the perceived risk associated to human activities, the sense of loss of control and self-confidence and psycho-social stress. Breakdown in social networks and lack of institutional responses and practicable coping strategies tend to aggravate the situation. In addition, growing uncertainty has well-known economic effects including an increase in the riskiness of investment, a rise in interest rates, higher saving propensities and risk aversion, i.e. changes that depress the current levels of investment and production. Rapid and unexpected change – may also increase sectoral and spatial mobility and organisational change, increasing in this way anomy and eroding social capital, sense of community participation and ability to undertake collective action. In times of rapid change, old rules, norms, and institutions no longer function as efficiently as they did in the past. If pre-existing informal institutions - such as voluntary associations, social networks, churches, the family and other primary support groups – are weakened it is likely there will be nefarious effects for social stability and security.

(vi) The nature and breadth of public response to the crisis induced by rapid change varied sharply. Yet, little is known on why some societies respond in a collective fashion to the dislocations caused by social change while others do not. Initial social stratification as well as political ideology affected the willingness and ability of governments to respond to the health crises once these have exploded. In egalitarian countries, such as the transition economies of Central Europe, public policy deliberately aimed at containing the health impact of the transformational recession. In turn, in the highly polarized Southern States of the USA, the health and nutrition problems faced by the disenfranchised slaves took very long to be addressed, as the collective response was non-existent. Likewise, in the highly unequal economies in transition of the former Soviet Union and South Africa, the crises were broadly ignored by the national authorities. One of the possible explanations of such attitude is that the new elites of a growingly more unequal society basically were not concerned by a crisis that mostly hit an economically marginal and politically disorganised group of marginal people with low education and skills, jobs, incomes and political representation.

(vii) Truly democratic and participatory societies appear to be better able to respond to the social and health challenges posed by rapid economic and social transformation. The same can be argued for societies benefitting from a wide range of genuine 'intermediate institutions' that help channeling political consensus, keep up the pressure on incumbent governments, undertake collective action and defend the interest of the most vulnerable section of society. A comparison of the mortality changes between the increasingly more democratic countries of Central Europe and some still autocratic former members of the FSU seems to support this view.

(viii) The possible acceleration of technological, institutional, policy and demographic change observed over the last two decades is likely to continue in the years ahead. In view of this, the

lessons of recent or past cases of political, economic and social upheaval constitute a valuable tool for the understanding of the potential health impact of those changes that are already on the horizon (as the massive transformation that has occurred in China or is underway in India) or are currently emerging, as Africa's accelerating mass migration towards Western Europe, or the employment impact of robotization. It is thus essential that the policy makers analyses systematically the evidence on the health impact of past systemic changes before they occur. Only this can constitute an efficient guide to a policy making that aims at preventing important dislocations during an era of rapid and possibly accelerating change.

References

- Adamets, S. (1997), "Les réponses démographiques aux crises socio-économiques : le cas de la Russie et de l'Ukraine aux XIXème et XXème siècles". Paper presented at the IUSSP XXIII International Population Conference, Beijing, 11-17 October.
- Aghion, P., B.J. Jones and C.I. Jones (2017) 'Artificial Intelligence and Economic Growth' version 1.0. College de France, LSE, Northwestern University, Stanford GSB and NBER <https://web.stanford.edu/~chadj/AI.pdf>
- Alderson, M. (1981), *International Mortality Statistics*. London: Macmillan Press.
- Anderson, B. and B. Silver (1990), "Trends in Mortality of the Soviet Population". *Soviet Economy*, 6 (3): 191-251.
- Azarova, A., D. Irdam, A. Gugushvili, M. Fazekas, G. Scheiring (2017), The effect of rapid privatization in mono-industrial towns in post-Soviet Russia: a retrospective cohort study'. *The Lancet*, Volume 2, Issue 5, May 1, 2017.
- Barbarin, O., L. Richter, T. de West and A. Wachtel ((1999), "Ironic Trends in the Transition to Peace: Criminal Violence Supplants Political Violence in Terrorizing South African Blacks", *Peace and Conflict: Journal of Peace Psychology*, 4(3), pp. 283-305
- Bhattacharya, J., C. Gathmann, and G. Miller (2013), "The Gorbachev Anti-Alcohol Campaign and Russia's Mortality Crisis." *American Economic Journal: Applied Economics* Vol. 5, Issue 2, April 2013.
- Beale, R. and L. Nethercott (1985), "Job Loss and Family Morbidity: A Study of a Factory Closure". *Journal of the Royal College of General Practitioners*, 35.
- Björklund, A. and T. Eriksson (1995), "Unemployment and Mental Health: Evidence from Research in the Nordic Countries". *Working Papers*, 95-12. Ahrus, Netherlands: Centre for Labour Market and Social Research, University of Ahrus.
- Blazek, J. and D. Džurová (2000), "The Decline of Mortality in the Czech Republic during the Transition: A Counterfactual Case Study", in G. A. Cornia and R. Panicià (Eds), *The Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Blum, A., A. Avdeev and S. Zakharov (1997), "Cohort Determinants of Mortality in Russia: Short- and Long-term Evidence". Paper presented at the meeting, "Economic Shocks, Social Stress and the Demographic Impact", UNU/WIDER, Helsinki, 17-19 April.
- Brainerd, E. and D. Cutler (2005), 'Autopsy on an Empire: Understanding Mortality in Russia and the Former Soviet Union'. , American Economic Association, vol. 19(1), pages 107-130, Winter.
- Coppedge et al. (2015), V-Dem Working Paper Series 2015:6. University of Goteborg

- Cornia, G. A. (1994), "Poverty, Food Consumption and Nutrition during the Transition to the Market Economy in Eastern Europe", *The American Economic Review*, 84 (2).
- Cornia, G. A. (1996), "Labour Market Shocks, Psychosocial Stress and the Transition's Mortality Crisis", *Research in Progress*, 4. Helsinki: UNU/WIDER.
- Cornia, G. A. (2000), "Short-term, Long-term and Hysteresis Mortality Models: A Review", in G. A. Cornia and R. Panicià (Eds), *the Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Cornia, G.A. and V. Popov, *Transitions and Institutions (2001): The Experience of Gradual and Late Reformers*. Oxford: Oxford University Press.
- Cornia, G. A. (2001), "Transition Approaches, Institutions and Income Inequality", in G. A. Cornia and V. Popov, op.cit.
- Cornia, G.A. (2004) "Rapid Change and Mortality Crises", *Popolazione e Storia*, 1/2004.
- Cornia, G.A. (2016) "The mortality crisis in transition economies" *IZA World Of Labour*, Institute for the Study of Labour (IZA), August 2016, Munich.
- Cornia, G. A. and R. Panicià (1996), "The Transition's Population Crisis: An Econometric Investigation of Nuptiality, Fertility and Mortality in Severely Distressed Economies", *MOCT-MOST*, 6: 95-12.
- Cornia, G.A., S. Rosignoli and L. Tiberti (2009), "Did globalisation improve health status? A simulation exercise", *Journal of International Development*, Vol. 21, pp. 1083-1101
- Denisova, I. (2010). Adult Mortality in Russia: Microanalysis. *Economics of Transition*, 18(2), 333–363.
- Desmond C. and G. Boyce (2003), 'Clinics and crime: The good and bad of South Africa's transition for the health of her citizens', paper prepared for the Health and Social Upheavals' sponsored by the Catharine and T McArthur Foundation.
- Downs, J. (2012), 'Sick From Freedom: African American Illness and Suffering during the Civil War and Reconstruction', Oxford, Oxford University Press.
- Dupuy, K. and S.A. Rustad (2018), 'Trends in Armed Conflicts', Peace Research Institute, Oslo.
- Dzúrová, D. (1996), "Mortality Patterns in the Czech Population during the Period of Societal Transformation after 1989". Paper presented at the meeting, "Economic Shocks, Social Stress and the Demographic Impact of Sudden Impoverishment", UNU/WIDER, Helsinki, 3-4 May.
- Eberstadt, N. (1993), "Mortality and the Fate of Communist States", *Communist Economies*, 2 (3).
- Edvinsson, S. and Nilsson (2002) 'Urban mortality in Sweden during the 19th century', mimeo.
- Ellman, M. (1994), "The Increase in Death and Disease under Katastroika". *Cambridge Journal of Economics*, 18: 329-55.
- Eyer, Joseph and Peter Sterling (1977), "Stress-related Mortality and Social Organization", *The Review of Radical Political Economics*, 9 (1), spring.
- Galab, S., E. Revathi and P.Reddy (2012) 'Farmers' suicides and unfolding agrarian crisis in Andhra Pradesh, Centre for Economic and Social studies, Hyderabad. https://www.researchgate.net/publication/290028142_Farmers'_Suicides_and_Unfolding_Agrarian_Crisis_in_Andhra_Pradesh

- Godek, Lisa (1997), "The Impact of Cohort Effects on Mortality Trends in Contemporary Ukraine". Paper presented at the IUSSP XXIII International Population Conference, Beijing, 11-17 October.
- Grigoriev, P., F. Meslé, V. M. Shkolnikov, E. Andreev, A. Fihel, M. Pechholdova and J. Vallin (2014), 'The Recent Mortality Decline in Russia: Beginning of the Cardiovascular Revolution?', *Population and Development Review*, Volume 40, Issue 1. Published online: 19 March 2014. [9](#)
- Goskomstat (various years), *Rossiyskiy statisticheskiy yezhigodnik*. Moscow: Goskomstat. -In Russian.
- Hill, J. (1977), *The Social and Psychological Impact of Unemployment: A Pilot Study*. London: Tavistock.
- Jackson R.H. (n.d.), T. Percy, F. Aparicio and P. Garcia (ed.) 'Demographic Crisis and Transition in Panama City, 1884-1946', <http://www.oneonta.edu/faculty/jacksrh/paper4.html>
- Jenkins, C. and L. Thomas (2004) "The Changing Nature of Inequality in South Africa" in G.A. Cornia (ed.) *'Inequality, Growth and Poverty in an Era of Liberalisation and Privatisation'*. Oxford: Oxford University Press.
- Jozan, Peter (1997), "Main Features of the Hungarian Demographic Situation in the Early Nineties", in National Institute for Health Promotion, *Annual Report 1996*. Budapest: National Institute for Health Promotion.
- Kawachi, I., B. Kennedy and R. Wilkinson (1999), *Income Inequality and Health*. New York: The New Press.
- Krumins, J. and U. Usackis (2000), "The Mortality Consequences of the Transition to the Market Economy in Latvia, 1991-5", in G. A. Cornia and R. Panicià (eds), *The Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Livi Bacci, M. (1993), "On the Human Cost of Collectivization in the Soviet Union", *Population and Development Review*, 19 (4), December.
- Marmot, M. and M. Bobak (2000), "Psychosocial and Biological Mechanisms behind the Recent Mortality Crisis in Central and Eastern Europe", in G. A. Cornia and R. Panicià (Eds), *The Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Martikainen, P. (1995), "Socioeconomic Mortality Differentials in Men and Women according to Own and Spouse's Characteristics in Finland", *Sociology of Health and Illness*, 17: 353-75.
- Martikainen, P. and T. Valkonen (1996), "Excess Mortality of Unemployed Men and Women during a Period of Rapidly Increasing Unemployment", *Lancet*, 348: 909-12.
- Meeker, E. (1976), 'Mortality trends of southern blacks, 1850-1910: Some preliminary findings', *Explorations in Economic History*, volume 13
- Mielecka-Kubien, Zofia and Witold Zatonski (1997), "Economic Shocks, Social Stress and the Demographic Impact in Poland". Paper presented at the meeting, "Economic Shocks, Social Stress and the Demographic Impact", UNU/WIDER, Helsinki, 17-19 April.
- Milanovic, B. (1996), "Income, Inequality and Poverty during the Transition", *World Bank Research Papers*, 11.
- Minna Stern, A. (2005), 'The Public Health Service in the Panama Canal: A Forgotten Chapter of US Public Health' *Public Health Reports* 2005 November-December 120 (6), 675-679, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1497783/>

- Moskalewicz, J., B. Wojtyniak and D. Rabczenko (2000), “Alcohol as a Cause of Mortality in Societies Undergoing Rapid Transition to the Market Economy”, in G. A. Cornia and R. Panicià (eds), *The Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Paniccià, R. (1997), “Short- and Long-term Determinants of Cardiovascular Mortality: An Econometric Assessment of the Working Age Population in Russia, 1965-95”, *Research in Progress*, 14. Helsinki, UNU/WIDER.
- Pohjola, M (2001), *Information Technology, Productivity, and Economic Growth*, Oxford: Oxford University Press.
- Popov, V. (2007) ‘Shock therapy versus gradualism: the end of the debate (explaining the magnitude of transformational recession)’, *Comparative Economic Studies*, Vol. 42, Spring, No.1, pp. 1-57.
- Popov, V. (2018), ‘Mortality and life expectancy in post-communist countries. What are the lessons for other countries? A concept note for a new DOC research project. June 5, 2018.
- Pridemore, W. and V. Shkolnikov (2004), ‘Education and Marriage as Protective Factors against Homicide Mortality: Methodological and Substantive Findings from Moscow’, *Journal of Quantitative Criminology*, Vol.20, N.2, June 2004.
- Rachiotis, G., D. Stuckler, M. McKee and C. Hadjichristodoulou (2015), ‘What has happened to suicides during the Greek economic crisis? Findings from an ecological study of suicides and their determinants (2003–2012)’, *British Medical Journal Open* 2015;5: <http://bmjopen.bmj.com/content/5/3/e007295.full>
- Razvodovsky, Y.E. (2016), ‘Alcohol Consumption and Suicide Trends in Russia, Belarus and Ukraine’ *Jacobs Journal of Addiction and Therapy*, 12-30-2016. Open access.
- Rychtarikova, J. (2004), ‘The Case of the Czech Republic. Determinants of the recent turnover in mortality’ *Demographic Research*, Special Collections 2, Article 5.
- Roser, M. (2017), ‘Link between health spending and life expectancy: US is an outlier’, 26 May 2017 <https://ourworldindata.org/the-link-between-life-expectancy-and-health-spending-us-focus>
- Roser, M. (2018), ‘Life Expectancy’ published online at Our World in Data /org. Retrieved from: <https://ourworldindata.org/life-expectancy>
- Ruzicka, L. (1995), “Suicide Mortality in Developed Countries”, in A. Lopez, G. Caselli and T. Valkonen (eds), *Adult Mortality in Developed Countries*. Oxford: Clarendon Press.
- Sen, A.K. (1997), “Inequality, Unemployment and Contemporary Europe”, *International Labour Review*, 136 (2), Summer.
- Schiering, G., D. Irdam and L. King (2018), ‘Cross-country Evidence on the Social Determinants of Post-Socialist Mortality Crisis in Europe: a Review of Performance-Based Hierarchy of Variables’, *Sociology of Health and Illness*. doi:10.1111/1467-9566.12846, <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-9566.12846>
14 December 2018.
- Shapiro, Judith (1994), “The Russian Mortality Crisis and its Causes”, *Working Papers*, 99. Stockholm: Östekonomiska Institutet.
- Shkolnikov, V. M. and A. Nemtsov (1997), “The Anti-alcohol Campaign and Variations in Russian Mortality”, in J-L. Bobadilla, C. Costello and F. Mitchell (Eds.), *Premature Death in the New Independent States*. Washington, DC: National Academy Press.

- Shkolnikov, V. M., D. Leon, S. Adamets, A. Dev., and E. Andreev (1998), "Educational Level and Adult Mortality in Russia: An Analysis of Routine Data, 1979 to 1994", *Social Science and Medicine*, 47 (3): 357-69.
- Shkolnikov, V. M. and V.Chervyakov (2000) Policies for the Control of the Transition Mortality Crisis', UNDP Russia and Transnational Family Research Institute, Moscow.
- Shkolnikov, V. M. and G. A. Cornia (2000), "Population Crisis and Rising Mortality in Transitional Russia", in G. A. Cornia and R. Paniccià (Eds.), *The Mortality Crisis of Transitional Economies*. Oxford: Oxford University Press.
- Shkolnikov, V., S. Cervyakov, M.McKee and D. Leon (2004) 'Russian mortality beyond vital statistics:Effects of social status and behaviours on deaths from circulatory disease and external causes -a case-control study of men aged 20-55 years in Udmurtia, 1998-99'. *Demographic Research*, Special Collection, 2, Article 4. Max Planck Institute Rostock.
- Shkolnikov, V., M., Andreev, D. Jasilionis A. Leinsalu, O. Antonova, M., McKee. (2006), 'The changing relation between education and life expectancy in central and eastern Europe in the 1990s', *Journal of Epidemiological and Community Health*, 60, p. 875-881.
- Shkolnikov, V., M., Andreev, E. M., D.A. Leon, M., McKee, F. Meslé, and J. Vallin. (2006), 'Mortality Reversal in Russia: the Story so Far', *Hygiea Internationalis*, 4:4, 29-80.
- Shaw, M. (1996), "South Africa: Crime in transition", *Terrorism and Political Violence* 8(4), 156-175.
- Smith, R. (1992), "Without Work, All Life Goes Rotten", *British Medical Journal*, 305 (24).
- Stuckler D., L. King and M. McKee (2009)'Mass privatization and the post-communist mortality crisis: a cross national analysis'. *The Lancet*, Jan 31, 373, pp.399-407.
- Streak, J.(2004). "The Gear legacy: Did Gear fail or move South Africa forward in development?". *Development Southern Africa*. 21(2).
- Sudhakumari V.M. (2002), 'Globalization, Economic Reforms and Agrarian Distress in India: a Study of Cotton Farmer's Suicide in Warangal District', paper presented to the 2002 GDN Award for Research Papers, University of Kerala, Kariacattom Campus, Thiruvananthapuram,
- Sundin, J. and S. Willner (2002), "Health and Social Transitions: The Swedish Case". Mimeo.
- Szreter, S. (1997). 'The demography of political and economic crisis at industrializing Britain, 1815-1914'. Paper presented at the 23rd IUSSP General Population Conference held in Beijing, 11-17 October.
- Terreblanche, S.(2002), "*A history of inequality in South Africa, 1652-2002*". University of Natal Press and KMM Review Publishing, Pietermarizburg.
- Treml, V. (1997), "Soviet and Russian Statistics on Alcohol Consumption and Abuse", in J-L. Bobadilla, C. Costello and F. Mitchell (eds), *Premature Death in the New Independent States*. Washington, DC: National Academy Press.
- UN DESA (2017) 'The International Migration Report 2017', New York, United Nations
- UNDP (1996), *Human Development Report*. New York: Oxford University Press.
- UNICEF (1994) 'Crisis in Mortality, Health and Nutrition', *Regional Monitoring Reports*, 2. Florence: UNICEF-International Child Development Centre.

University of Goteborg (2018), 'Variety of Democracies: Quick start Guide' V 8, October 2018.

Warr, P. (1987), *Unemployment and Mental Health*. Oxford: Clarendon Press.

WIDER (2018), 'World Income Inequality Database 3.4' <https://www.wider.unu.edu/project/wiid-world-income-inequality-database> (accessed on 20 November 2018)

Wilkinson, R. (1996), 'Unhealthy Societies: the Afflictions of Inequality'. London, Routledge

Williamson, J. (1996), "Globalisation and Inequality then and now: the Late 19th and late 20th Centuries Compared", *NBER Working Paper Series* N.5491, Cambridge

Annex Table 1. Number of excess deaths in relation to the 1989 level

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Czech.	0	1791	-3492	-7474	-9597	-10356	-9754	-14886	-14935	-18157	-17905	-18488	-19844	-19474	-16491	-20605	-19957	-23477	-23574	-23221	-20514	-20788	-20982	-19600	-18555	-22199
Hungary	0	-499	-1361	2672	4182	813	-631	-2902	-6591	-5120	-2738	-10428	-13823	-13125	-10176	-13553	-10298	-14500	-13095	-16050	-15648	-15528	-17028	-16580	-19191	-19723
Poland	0	7303	22749	11871	9519	3719	3642	3048	-2199	-6978	-817	-14225	-19022	-22701	-16935	-18696	-13932	-12459	-5024	-3000	3213	-4018	-6803	2496	5241	-5771
Slovakia	0	919	711	-451	-1186	-2491	-1153	-2599	-1700	-655	-1406	-1077	-1688	-2251	-1557	-1953	-329	-503	37	-674	-931	-177	-1936	-1377	-1718	-2462
Slovenia	0	-130	660	688	1367	690	295	-33	269	402	171	-92	-179	28	775	-151	129	-521	-156	-390	14	-74	6	573	655	209
Tot	0	9385	19267	7305	4286	-7625	-7600	-17372	-25156	-30508	-22695	-44311	-54557	-57524	-44383	-54959	-44387	-51459	-41812	-43335	-33867	-40586	-46742	-34488	-33568	-49946
Estonia	0	1042	1289	1905	3024	3924	2487	642	151	1035	-206	-48	71	-96	-296	-774	-1139	-1141	-1069	-1815	-2411	-2695	-3237	-3027	-3238	-3008
Latvia	0	2308	2279	3239	6970	9521	6605	1922	1130	1783	395	-172	650	80	30	-356	367	670	600	-1357	-2377	-2201	-3823	-3395	-3719	-3994
Lithuania	0	1663	2937	3472	8197	8614	7427	5006	3239	2853	2089	1006	2413	3097	3037	3839	6178	7034	7836	5977	4258	4676	3317	3103	3658	2352
Tot	0	5013	6505	8616	18190	22060	16519	7570	4520	5672	2278	787	3134	3081	2771	2709	5407	6564	7367	2805	-530	-220	-3744	-3319	-3298	-4649
Albania	0	392	59	194	-69	314	51	-428	279	323	-1224	-602	-2784	-1676	43	208	-382	-865	-3279	-1653	-2138	2322	2288	2633	2576	2791
Bulgaria	0	996	2672	475	1480	3778	6739	9140	14062	10345	3832	7156	5955	4718	4023	2172	5461	5506	5069	2545	151	3376	346	1378	-3598	1057
Romania	0	415	7072	17272	16727	19537	25236	39855	32888	22617	18617	9190	13055	26672	20171	14101	16099	12092	8179	6205	9690	11357	3476	7423	644	7081
Tot	0	1803	9803	17941	18138	23630	32026	48566	47229	33285	21225	15744	16226	29714	24238	16481	21178	16732	9969	7096	7702	17055	6110	11434	-378	10929
Belarus	0	6288	11312	13177	25198	26923	30702	30364	33693	34331	39039	31887	37406	43883	40406	37244	39060	35502	29961	30792	31903	33978	31914	23250	22007	18170
Moldova	0	2402	5885	4578	6608	11540	13051	9828	6550	-77	1346	1273	113	1905	3142	1706	4752	3188	3098	1976	2159	3649	-748	-442	-1932	-496
Russia	0	72301	108998	226869	550529	720273	624775	503811	437036	410227	568759	649497	679623	757489	792049	718042	728180	589248	500998	495743	429579	448003	344148	324114	289437	314909
Ukraine	0	29134	69412	96029	142766	167704	195812	180260	157271	122977	142287	161489	152231	158655	168361	164190	185066	160576	165306	156512	108310	99822	61352	62262	63473	50337
Tot	0	110125	195606	340652	725102	926440	864341	724263	634551	567459	751431	844146	869374	961932	1003957	921183	957057	788514	699363	685023	571951	585452	436665	409183	372985	382920
Armenia	0	1173	2573	4930	6696	3962	4163	4256	3310	2548	3433	3416	3394	4929	5371	5029	5730	6551	6165	6743	6876	7229	8401	6939	6605	7109
Azerb.	0	-1089	685	7206	8773	10932	6905	4364	3082	2437	2403	2816	1420	2652	5116	5628	7989	8255	9655	8711	8569	9594	9749	11008	10385	11660
Georgia	0	1012	2774	6121	10294	1454	119	-1010	-1718	-2068	-2207	-2640	-3198	-2974	-3373	-816	-9225	-7287	-8337	-6579	-3218	-1886	87	-150	-1057	4058
Tot	0	1096	6032	18257	25763	16348	11188	7610	4674	2917	3629	3591	1616	4608	7114	9841	4494	7519	7483	8875	12227	14937	18237	17797	15933	22826
Kazak.	0	2602	8241	11863	30807	36524	44437	43996	35718	29534	21733	24012	22001	23355	28890	25676	30424	30351	31457	24940	16309	19360	17977	15926	9001	3970
Kyrgyz.	0	-435	-189	1290	3821	6247	5847	3539	3499	3546	1837	3166	1744	4295	4947	4065	6021	7570	7249	6720	4884	5196	4918	5046	3754	4422
Uzbek.	0	-2411	2949	12678	17878	21403	18225	17657	10309	13673	3796	8915	5951	10394	9402	3778	14015	12909	10598	11832	6696	9905	16411	19126	18682	22684
Tot	0	-244	11001	25831	52506	64174	68510	65191	49525	46753	27366	36093	29696	38044	43239	33519	50460	50830	49304	43492	27889	34461	39306	40098	31437	31076
Tot	0	127177	248214	418602	843985	1045026	984983	835829	715343	625578	783234	856051	865490	979853	1036935	928774	994209	818700	731675	703957	585372	611099	449833	440706	383109	393157