MORTALITY DEVELOPMENT AND ECONOMIC TRANSITION: CASE OF ESTONIA

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The paper was prepared in the framework of UNU WIDER Project *Economic Shocks, Social Stress and Mortality Impact*. The Project focused primarily on mortality levels under societal transitions and sought for the explanation of excess mortality which has been observed in many countries since the end of 1980s. However, evidence presented in the paper gives strong support to hypothesis that the mortality increase observed in Estonia during current economic transition should be considered in the wider context of the long-term mortality stagnation rather than limit the approach to short-term changes, in spite of certain impact of social distress reflected through the growth in specific causes of death. Such an understanding is also consistent with the basic principles of population development, according to which deaths due to endogeneous causes cannot be explained by sharp but short-term influence. Unfortunately, this approach happened not to fit in the UNU WIDER Project where the emphasis was strongly on immediate impact of current economic transition on mortality levels.

In Europe the end of the 1980s and the beginning of the 1990s have instituted fundamental changes. The collapse of communist ideology, particularly in its state-building role, has meant the transition towards market economy, and for some of the Central European nations, restoration of national independence. The multiple changes have grown into an extensive societal reform, requiring more than a decade to be accomplished and challenged Central Europe with a range of implications stretching to population processes. Among the latter, the health crisis characterised by specific pattern of excess mortality should be regarded as one of the most serious concern and the highest cost of transition. Apart from other problems, human lives lost in transition cannot be replaced later when reforms are accomplished and society reaches more stable development. Geographically, the health crisis has affected all Central European countries and in some of them the recent increase of mortality has been probably the highest ever recorded during a peacetime in modern history. Furthermore, the mortality increase is contrasting to the improvement in all other continents; though the life expectancy may be still lower in some developing regions, it has nowhere been characterised by such a recession.

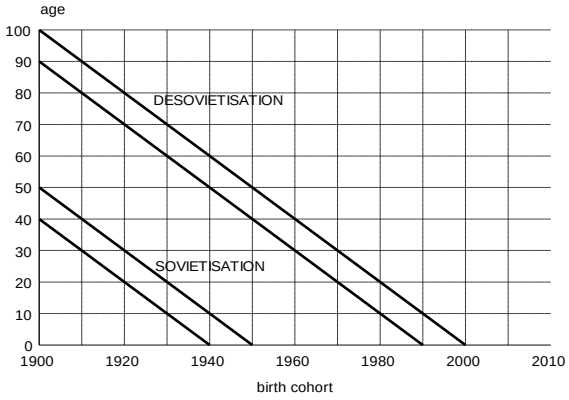
From the historical perspective, in case of Central European countries the current change is not the first social transition to be overcome in this century. Half a century ago the principles of societal build-up to which we are now moving, were declared annuated. On the individual level, the rearrangements proceeded in rather violent way and now the survivors have to make efforts to return to the starting point. As illustrated by the accompanying figure, several birth cohorts appear directly affected by both transitions and through family ties, it concerns the entire population. For the three nations, Lithuanians, Latvians and Estonians, the first transition had been aggravated by the deprivation of national independence and particularly large human losses. Those losses were highly selective and the introduced effect followed the respective cohorts over long run. Concerning mortality trend, this specific cohort effect persists beyond the 20th century. Naturally, it is extremely complicated to study as requires the quantification of cohort selectivity during the first transition and longitudinal data for the following fifty years.

The focus of the paper is on the second societal transition in Estonia, desovetisation. The first section of the paper presents the mortality trends and patterns, in the second section paralleling developments and some hypothesis concerning the linkages between the societal transformation and population mortality are discussed. However, the changes of the 1990s are forming a part, and most probably just a smaller one, of the social developments which should be considered to understand the current mortality pattern. Therefore, it should not be surprising to find the principal explanation for the health crisis prevailing in Central Europe beyond the time frame of the current transition period itself. Of course, such connection makes the research of health crisis complex, and in this respect, the paper is dealing only with limited aspects.

1. DEVELOPMENT OF POPULATION MORTALITY

Estonia belongs to nations which development offers good prospect to study the transitional and post-transitional mortality trend in diverse social context. On one hand, as common to the forerunners of the demographic development the mortality decline started in Estonia already prior to the mid-19th century, and therefore the modern cause-specific

Figure 1 PRINCIPAL PERIOD EFFECTS FOR CURRENT POPULATION
Estonia 1997



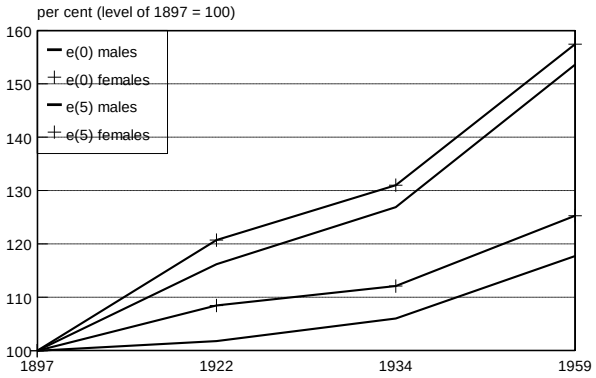
mortality pattern has lasted comparatively for a long period. On the other hand, Estonia happened to be a subject to severe societal crises, having much more extensive impact on population than common to European nations in general. These arguments have been put forward for in a comprehensive study of Estonia as well as other Baltic countries by INED, focusing on the long-term cause-specific mortality [Hertrich, Mesle, Vallin, 1997; Mesle, Hertrich 1997]. From the historical perspective it becomes evident that the social crises and turning points of the mortality trend are not necessarily coinciding. Such diversion could stem from the lagged effect of cohort experience as well as by relative independence of mortality from current social conditions. Regarding Estonia, it had namely not been during the crisis period when the mortality pattern changed. This principal transformation should by all means be considered much more crucial than any modification of mortality levels, including the current transition period. To put the recent health crises into broader context, followingly the main features of the Estonian long-term mortality trend are presented.

1.1. Mortality Trend until the 1990s

In pioneering European nations of the demographic transition, the general mortality trend at the second half of the 19th century and first half of the current century has been dominated by the epidemiological transition [Caselli 1993; Schofield, Reher, Bideau 1991]. The same has been true for the Estonian population and the relatively early timing of the process should be underlined, i.e Estonia belongs to the forerunners of the demographic transition [Katus 1995]. Concerning the 20th century, the life expectancy at birth demonstrated the continuous increase. Moreover, this increase occurred in close parallel with other North-European nations. Compared to East- and South-European countries, Estonia continuously occupied one of the leading positions in level of life expectancy during those decades [Krumins 1993].

The transitional decline of mortality could be followed up to the end of the 1950s [Katus, Puur 1992]. The data reveal the increase in male life expectancy at birth up to 64.3 years and correspondingly to 71.6 years for females in 1959 (Figure 2). The decline of mortality appears rather even during the whole period of demographic transition. In inter-censal interval of 1897-1922 the annual growth is 0.27 years for males and 0.38 years for females, for the periods 1922-1934 and 1934-1959 the rates are 0.44 and 0.39, and 0.44 and 0.48 years correspondingly. Considerable part of the increase is explained by the decline of infant (and child) mortality which is naturally the principal component of the mortality transition. Leaving this effect aside, the increase in life expectancy in all other ages has been much smaller (life expectancy at age 5 is presented in Figure 2) but following the same pattern.

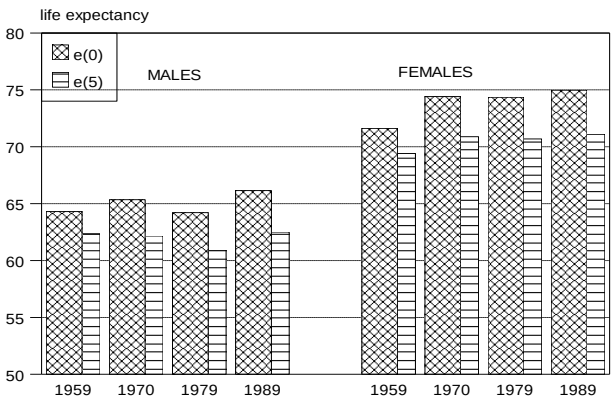
Figure 2 LIFE EXPECTANCY AT AGE 0 AND 5: RELATIVE CHANGE
Estonia 1897-1959



Particularly noteworthy is the continuation of mortality decline between censuses 1934-1959. The years of WW II and even more the violent introduction of Soviet regime in 1940-1941 and 1944-1954 have definitely involved extreme difficulties for the Estonian population. Direct human casualties have been estimated at least 17.5 per cent of the total population [Katus 1989]. Nevertheless, for survivors, including the deported and imprisoned, the life expectancy continued to grow. Thus, the first societal transition, sovetisation, has been characterised by the improvement in the trend of population mortality. Already then, the hypothesis of the prolonged time lag between social conditions and their (plausible) mortality outcome could have been raised. Evidently, those interrelations will take a new form when the endogenous cause-pattern of deaths becomes prevalent. In other words, one should expect rather different causal linkage during pre-transitional mortality with high prevalence of exogenous causes of deaths, and the post-transitional stage of mortality.

During the next three decades of 1959-1989, the stability of life expectancy in Estonia could be summarised as mortality stagnation (Figure 3). There has been only negligible increase of life expectancy at birth, and even this growth is mainly put forward by the improvement of infant mortality which continued to decline during the 1960s i.e. a decade after the stagnation of general mortality had taken the prevalence. Thus, the Estonian mortality pattern combining very low adult life expectancy and relatively advanced level of infant mortality, untypical in respect both to Coale-Demeny as well to UN model life tables and so typical to the current situation, had developed already in the 1960s [Katus, Puur 1991; 1992]. The mortality stagnation in 1959-1989 could be characterised not as much by the absence of progress in mortality level but mainly by the deterioration in age-specific mortality pattern. Considering the whole period, the deterioration is particularly notable for males at ages 20-55. The change in female mortality pattern has been in the same direction but not so well-expressed. Compared to countries of Central Europe with similar experience, early demographic transition has contributed to particularly prolonged mortality stagnation in Estonia. Although the phenomenon has been internationally well documented and addressed by extensive scientific discussion, its ultimate cause still remains unidentified [Bourgeois-Pichat 1984; Mesle, Vallin 1993]. In any case, the principal explanation of mortality stagnation should be sought from the change of the mortality pattern rather than from the levels. Correspondingly, it seems too simplified to seek causal linkages from any concrete socio-economic

Figure 3 LIFE EXPECTANCY AT AGE 0 AND 5
Estonia 1959-1989

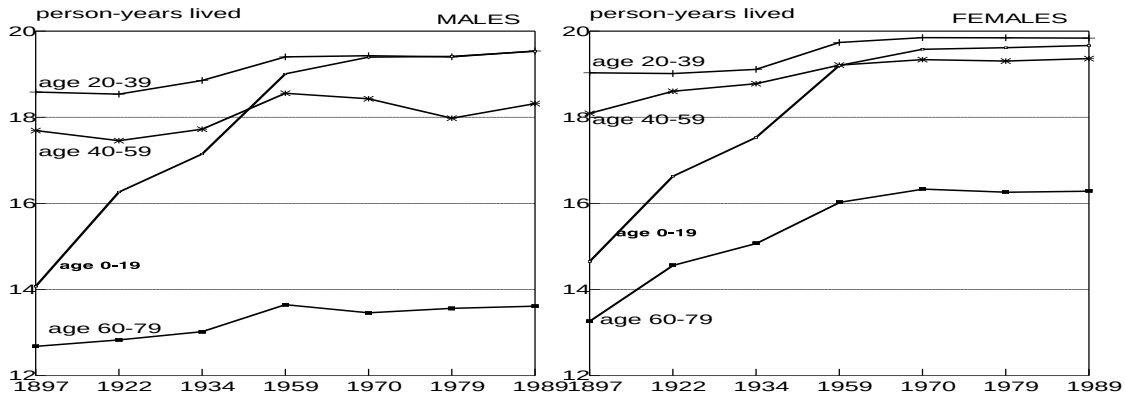


indicators which typically work alongside the age-profile and therefore cannot principally explain the change in the pattern.

Age-specific mortality trend in Estonia could be summarised by the method of potential demography, Figure 4 presents person-years lived in four aggregated 20-year age-intervals. The number of person-years in every age interval, in order to make the estimates comparable, is calculated to survivors to its beginning. In this presentation, the time frames for both mortality transition and stagnation period become distinctly demarcated. Also apparent is the principal cause of mortality stagnation: cessation of progress in older ages, i.e in the age group of 60-79 in this comparison. In other words, it becomes evident that among males the fourth stage of epidemiological transition [Olshanski, Ault 1986] has not begun in Estonia, or has stopped which is true for females. Peter Laslett has described the same stage of the epidemiological transition as the emergence of the Third Age population, attributing to decreasing old-age mortality an important social dimension [Laslett 1993]. Therefore, the mortality stagnation is not only the problem of shorter life-span and health but also the principal feature of population composition.

One of the direct consequences of prolonged mortality stagnation has been the changed position of Estonia among European nations [Council of Europe 1996]. Due to the above-described lack of progress all West and North as well as South European countries, characterised by lower levels at the end of the 1950s, have clearly surpassed Estonia up to the end of the Soviet period. Additionally, in most of the East-European countries, also suffering from the worsening trend of mortality, the life expectancy stagnated at somewhat higher levels than in Estonia. In cross-country comparison of female mortality Estonia holds slightly better position but still the deteriorating trend is clearly evident. Comparison of male and female experiences reveal an extensive sex difference which is another important feature of the Estonian mortality pattern already prior to the recent societal transition. Considering the discussed developments, such feature could have naturally been expected, however, the scale of the difference is still impressive. Although slightly diminished in the 1980s, it accounted for nine years in 1989.

Figure 4 PERSON-YEARS LIVED IN 20-YEARS AGE INTERVALS FOR SURVIVORS REACHING THE BEGINNING OF THE INTERVAL
Estonia 1897-1989



Even the short overview of Estonian mortality trend between the mentioned two societal transitions is clearly indicating the presence of sustained health crisis prior to the second transition had started. This crisis had been developed gradually, and one could say, even unnoticeable for those non-demographers considering the data covering only a few years. However, when related to the European experience, the situation could not be

characterised otherwise than a continuation of a long-term health crisis. It is evident when comparing Estonia with the countries of the same demographic stage. Taking notice of the situation preceding to the second societal transition, in the following, the mortality development of most recent six-seven years could be understood better.

Traditionally the general mortality trend is supplemented with the discussion of differential mortality, to provide the clue to the explanation of the trend. Under pre-transitional as well as transitional mortality, the differences between urban and rural population have been particularly expressed. One should notice that life table estimates in Table 6 are not forming consistent time series because of building on administrative division of a specific year; recalculation of urban-rural time series has not been accomplished. In the 1990s the inconsistency has grown to the extent that the estimates have not been published. The urban-rural differences have maintained in Estonia but the trend in both rural and urban population follows the similar pattern and is therefore of no use for understanding the trend. Differently form urban-rural, the mortality for two major subgroups of population, Estonians and non-Estonians are consistently recalculated for census years (Table 7). Although the differences exist, both subpopulations have experienced the mortality stagnation. Moreover, the time frame for the stagnation is similar for both of them [Katus, Puur 1992]. Regarding regional differentiation, it could be analysed on the basis of 1986-1991 life-tables which is the only set available on county level. The variation of life expectancy at birth accounts for 3.5 years which is actually quite a noticeable difference [EKDK 1994]. Nevertheless the mortality pattern itself has undergone similar transformation in all counties and does not vary. The differentiation of mortality could be followed by additional socio-economic indicators but their discussion would add little to the above mentioned conclusions. The differential mortality introduces a lot interesting and useful details but contributes nothing to the understanding of mortality stagnation.

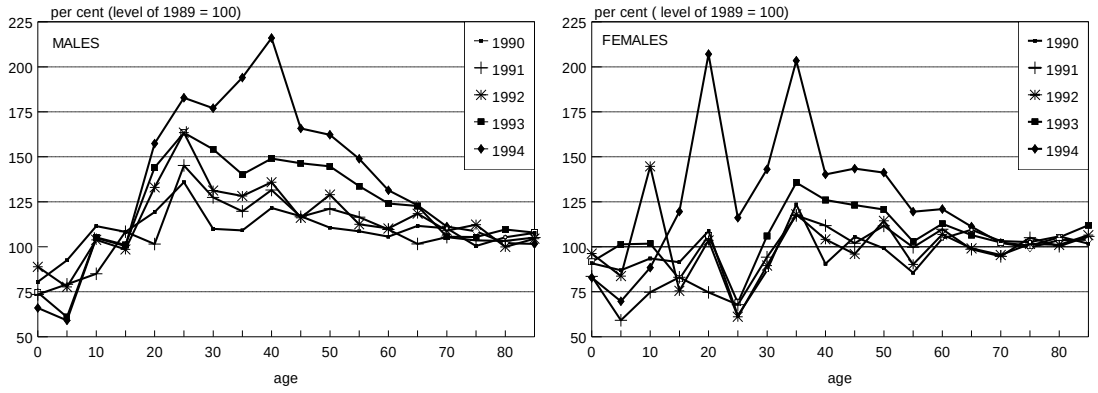
1.3. Mortality During Recent Societal Transition

Discussing the recent mortality in Estonia as well as in some other countries of Central Europe one should seriously consider data complications. In case of Estonia, the general overview of data quality issues is given elsewhere [Katus, Puur, Sakkeus 1997]. Shortly summarising, the registration of deaths has maintained its good coverage and data on the number of deaths are reliable. Also, the characteristics in the registration form, including the cause of death could be regarded as relatively accurate: there are no principal deficiencies in registration and even some improvements could be followed in cause-specific statistics. On the other hand, the population number and age-structure have become increasingly distorted. By now the new estimates are developed, deviating ca five per cent for total population and nearly ten per cent for some age groups [ESA 1997]. Correspondingly, all population indices using the number of population or some of its part as a denominator have been estimated too high; the values of mortality indicators like age-specific rates are artificially inflated in all statistical publications 1991-1997. Due to the cumulation of inaccuracy, the error has increased with each subsequent year, i.e. figures for 1996 are less correct than the same indicator for 1991, for example. Deficient in respect to total population, estimates for any subgroup, even if available, include more noise than truthful information which makes it impossible to follow the trends in differential mortality during the 1990s.

Comparison of mortality rates reveals curvilinear development across age groups (Figure 5). Annual rates for 1990-1994 are compared to the level in the census year 1989, expressing the progressive increase as well as shifts in mortality curve. In case of male population mortality has developed in one direction, each year adding its contribution to the cumulative effect. Namely, rates have demonstrated increase in all age groups, except under age ten where the noticeable decrease has occurred. The growth has been highest among middle-aged men, doubling the level of 1989 in some age groups. In age range 20-49 the increase has averaged ca 150 per cent which must be regarded very high taking into account the initial level. Moving to older ages the growth of mortality is gradually slowing down and, compared to younger, seems to have become negligible beyond age 70. Nevertheless, no decline of mortality could be observed either in any of the older age groups. Female mortality does not display so clear one-way trend from year to another, however, the principal direction of changes appears similar: the highest increase is observed among middle-aged female population. It should be noted that the sharp increase of mortality among young adults in 1994, particularly for age group 20-24, is introduced by the disaster with m/s *Estonia*.

In short, the population health situation has been undoubtfully worsened and the life expectancy decreased in Estonia during 1989-1994. Because of abovementioned problems with data quality, the exact extent of change in levels cannot be estimated as will be shown in the next section. Despite of worsening trend, however, no change of mortality pattern has emerged during the current transition. The observed decline in life expectancy reflects simply the aggravation of old tendencies having become evident already during the period of mortality stagnation. Features like increasing adult mortality, decreasing infant mortality, absence of progress in older ages, gender discrimination against male population etc are exactly the characteristics of mortality stagnation in Estonia for the past 30 years. This similarity suggests that the same mechanisms which have lied behind the stagnation have been responsible for the mortality increase during the current transition. However, the

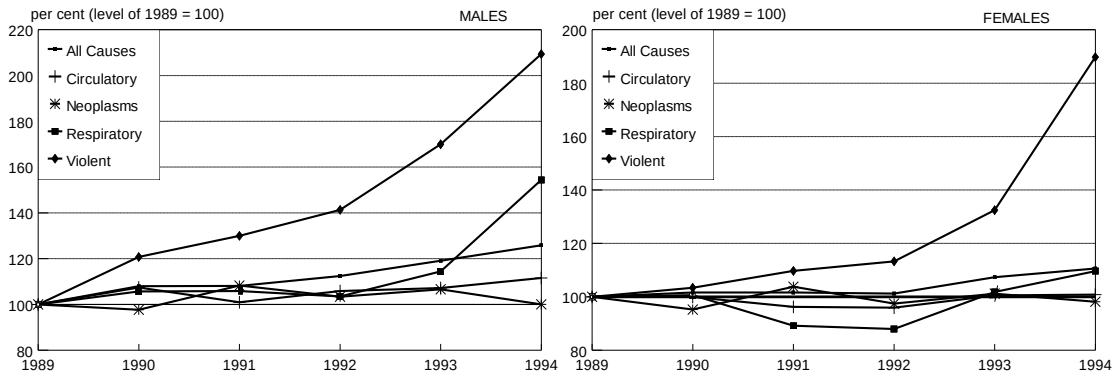
Figure 5 AGE-SPECIFIC MORTALITY RATES: RELATIVE DYNAMICS
Estonia 1989-1994



common understanding could review the recent trends as a result of some specific processes which have resulted from the societal reconstruction and it provides an alternative hypothesis. Indeed, the quantitative verification of both hypothesis proves to be very difficult. Most likely, it is the reason why no analysis to test these alternatives has not yet been undertaken or at least not known to the authors of this paper, despite the bulk of literature on health crisis in Central Europe.

To present the cause-specific mortality, the main death causes are dealt separately: cardiovascular diseases (codes 390-459 by ICD-9), neoplasms (140-239) and violent deaths (E800-E999). Mortality from respiratory diseases (codes 460-519) are added to main cause groups (Figure 6). Regarding male population, all of the mentioned causes are demonstrating the growth between 1989-1994. However the two main causes, diseases of circulatory system and neoplasms, covering the overwhelming majority of death cases are both demonstrating slower increase relative to the aggregate. The most sharp increase is shown by violent deaths, clearly departing from all other causes. The frequency of violent deaths has grown more than twice over the six years. The development for the female population has been similar, however, deaths due to circulatory diseases and neoplasms have shown only slight increase or stability, and even decrease in some years. The trend of increase in violent deaths is shared with males. In relative terms, the growth of violent deaths has been only slightly smaller for females, however, the levels have remained significantly different. Naturally, the discussion of cause-specific mortality should incorporate the analysis of age-profiles, separately for each of the main causes. The details of this analysis could not be included to the paper for reasons of the length. Interesting in themselves, age-profiles basically supported conclusions already made. The most remarkable development is related to violent death.

Figure 6 STANDARDISED MORTALITY RATE BY CAUSES: RELATIVE DYNAMICS
Estonia 1989-1994



Life table calculations were made to measure the impact of violent deaths on life expectancy at birth. By 1994 the loss of life expectancy because of all violent causes combined has reached 6.3 years for male population and 2.4 years for females. Despite the increase having been comparable between males and females, the absolute loss for male population is exceeding the corresponding figure for females several times. Such a divergence is a result of large initial difference: in 1989 the loss of life expectancy at birth due to violent causes was 4.6 years for males and only 1.7 years for females. In this view, violent deaths once more stress the continuity of principle trend developed during earlier decades. As the next step violent death can be decomposed into suicide, homicide, transportation accidents and alcohol poisonings leaving the rest of violent causes all together. Each of four mentioned causes play a relatively similar role in decreasing life expectancy: suicide 1.04 years for males and 0.30 years for females, homicide 0.85 and 0.22 years, transportation accidents 0.86 and 0.29 years, alcohol poisonings 0.60 and 0.26 years, and other violent causes together 2.96 and 1.26 respectively. The relative contribution of each component has been similar for male and female population, different are just the levels. In other words, it is not possible to attribute the increase in violent causes to some specific subdues. It is more likely to expect that some kind of general

reason is undermining the safety of societal environment and reflected, among others, in the increasing probability of different violent causes.

2. SOCIETAL TRANSITION AND MORTALITY DEVELOPMENT

Transition from authoritarian to democratic society involves a vast array of institutional changes, covering virtually all segments of societal organisation. On one hand, the old institutions and models have to be dismantled, and on another hand, new structures need to be created. If the implementation of both tasks is fully synchronised, the more or less stable development can be expected, avoiding major setbacks. Such interaction is seldomly the case, however, and more often this replacement of institutions involves the timing discrepancy which immediately leads to the weakness of institutional framework. In case of Estonia, the network of non-governmental organisations was put nearly out of existence, using the measures of police state as well as by legislation. The revival of democratic society naturally gave the opportunity to the re-emergence of non-governmental network. However, due to circumstances it was more a recipient than provider of support during transition and therefore not in the position to soften the deficiencies of state institutions.

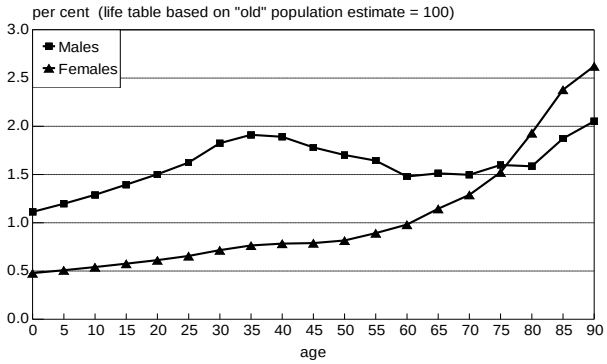
On the individual level, the transformation of society encountered people with new opportunities, ranging from political rights to improved consumer choice. Inevitable for social progress, the increase in personal freedom has not avoided the spread of negative, and even socially pathological behaviour. Without the experience of democracy, not everyone has been willing or able to make their choices respecting the generally accepted norms. In most of the cases, such behaviour added the risk factors for the person itself, in other cases it threatened also the community. The combination of the temporary weakness of the institutional framework of society and explosive growth in the variety of individual behaviours have rather contributed to the aggravation than to the progress of long-term mortality development and population health. Followingly the major societal discontinuities and their possible implications to recent mortality increase are discussed.

2.1. Deterioration of Data Accuracy

During the transition period, as it has been already mentioned, the data quality has become a major issue to be addressed. The reasons for this development are discussed elsewhere [Anderson, Katus, Silver 1994; Katus, Puur, Sakkeus 1997]. In short, the Estonian Statistical Office has not taken the responsibility for the integrity and comparability of data but only for mediation the available numbers based on different methodologies. As a result, inconsistent and sometimes even controversial data can be found in official publications. Regarding the current paper, the major concern are population number and age composition used as a denominator for all mortality rates. The inaccuracy of population estimates have reached the level which could no longer be ignored, and recently, under the initiative and guidance of scientific community the Statistical Office has produced alternative estimates for the population number and age-structure [ESA 1997].

Due to significant differences between the estimates, it became necessary to consider their impact on mortality measures. Considering the requirements of the current project, the revision included the recalculation of life tables using both the "old" and "new" stock data for the denominator; parallel life tables were prepared for 1995. The comparison of results reveals noticeable differences in life expectancy function, particularly for males. In life expectancy at birth the difference accounts for 0.70 years for male population and 0.35 years for female population. The absolute difference remains more or less stable up to the age of 35, followed by a gradual decrease. Definitely, the described age pattern does not coincide with the shape of mortality curve. This becomes evident from relative difference between life expectancy functions (Figure 7). For male population the difference nearly doubles prior to age 35, the gradient is also increasing for females. The highest relative difference between the two estimates could be found in older ages where the denominator starts to play more important role.

Figure 7 RELATIVE DIFFERENCE IN LIFE EXPECTANCY BASED ON TWO POPULATION ESTIMATES
Estonia 1995



The revision of population estimates is having a definite impact on present mortality levels in Estonia. According to the new tables the life expectancy appears higher than indicated by previous official figures. On the other hand, the data accuracy is explaining only relatively minor part of the recent decline in life expectancy, particularly for male population. In other words, although important enough to be considered, the data quality itself does not explain the increase of mortality levels in Estonia.

2.2. Erosion of Public Safety

The discussion of cause-specific mortality in the first section of the paper showed the most dramatic increase of violent deaths. The situation indicates to the deterioration of structure i.e., under-establishment of government institutions, weakness of social network, exuberance of narrowly commercial interest and growing tension of interpersonal relations. Followingly some aspects of the abovementioned change, unsafety of social environment and its potential implications to violent mortality are discussed.

2.2.1. Crime Safety

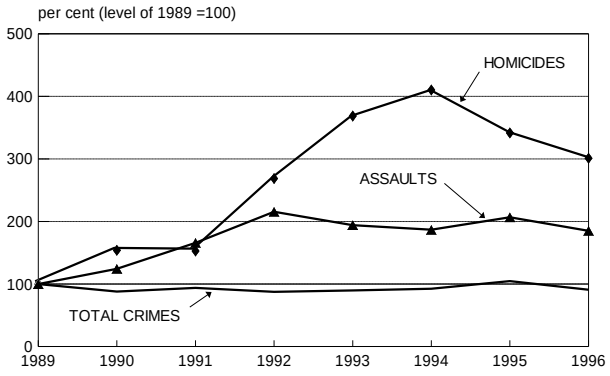
Transition period has been marked with a steep rise of criminality in Estonia. Under the former regime, the law enforcement institutions were directly operated from Moscow and for that reason, particularly the reorganisation of Soviet militia into police corps has involved extensive changes. According to the recent statement by the Minister of Interior the reform requires rather intensification than approaches to its completion. The crime prevention has been considered a task of police solely, this attitude tends to predominate among the population as well as in government institutions. First attempt towards more integrated approach was taken in 1995 when the Government approved a scheme for

developing a national criminal prevention program. The objective of the program is to get, in addition to law enforcement agencies, other central and local institutions as well as population more closely involved in crime prevention and restraint [Ahven 1994]. The social effectiveness of law enforcement can *inter alia* be followed in the proportion of solved crime cases. Between 1989-1992 the general clearance rate had fallen about twice, dropping well below 20 per cent. After reaching a bottom in 1992, which quite well coincides with the first major effort of reorganisation, the percentage of cleared crime cases has started to improve. Rising with each subsequent year, by 1996 the clearance rate in total crimes had returned to the level of 1990. Moreover, in a couple of recent years, the number of registered crimes has stabilised.

In Estonia the number of reported crimes fluctuated around five thousand until mid-1970s and ranged between 10-15 thousand during the 1980s it. In four years, 1989-1992 the number of crimes more than tripled. In fact, the real number may have been even higher as the true rate has become increasingly understated as people's trust in the capacity of police, and respectively the tendency to notify officials has dropped [Aromaa and Ahven 1995]. Consistent with more dynamic pace of transformation, crime rate in Estonia has been constantly the highest among the Central European countries, not speaking the countries of stable development. These trends clearly indicate the increase in criminal behaviour and the weakness of official structures to cope with the situation. Indeed, this development has meant for everyone the increased risk to become a victim. Although most of the crimes are property-related, the growth of offenses against persons is also characteristic.

With direct implications on mortality, crime development has contributed to the increase in homicides. Together with attempts, the number of intentional homicides increased more than four times between 1989-1994 with most dramatic upsurge being concentrated in 1991-1992. In cumulative terms more than one person out of every thousand was murdered during these years. Such situation is comparable only to the late 1940s when systematic terror was applied to establish the communist regime in Estonia. Aside homicides, also the number of assaults and infliction of bodily injuries has increased. Still, suggesting the development towards more brutal crime, the growth in homicides has considerably exceeded other types of personal offenses (Figure 8). While in the eve of transition infliction of bodily injuries significantly outnumbered homicides, the latter has become the single biggest category among offenses against persons. The same is indicated by the proportion between assaults of different severity. Besides referred direct implications, many other indirect linkages may exist between the deterioration of crime safety and worsening the population health, including growing disability.

Figure 8 OFFENCES AGAINST PERSONS
Estonia 1989-1996

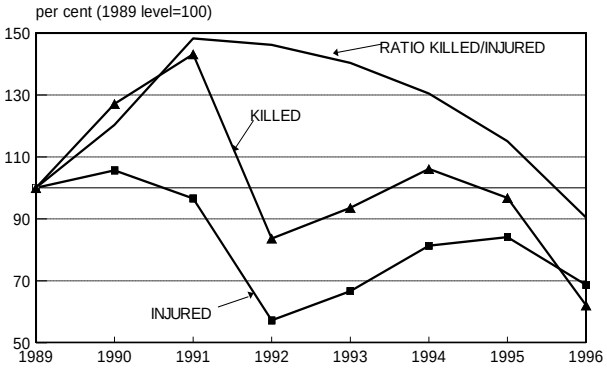


2.2.2. Traffic Safety

The traffic safety is rather an issue of increased opportunities of population than the weakness of societal institutions. The transition period has been characterised by an extremely rapid motorisation, particularly because passenger cars prior to reforms were available only restrictedly. In Estonia, another contribution was made by relatively rapid economic development. In 1989-1995 the number of passenger cars doubled, the increase in other vehicle types has been smaller. Moreover, in the first years the majority of added cars were the used ones with limited safety provisions. Differently from the number of vehicles, the road network and related safety facilities have remained virtually unchanged since the end of 1980s. Over the course of transition, the dynamics of traffic accidents has followed a curvilinear pattern with the increasing trend until 1991-1992 and moderate reduction thereafter. In the recent years technical requirements to the vehicles have been gradually improved and with newer cars the modern safety systems are becoming increasingly common (belts on all seats, wheels for winter season etc). Motorcycles which offer the least protection in case of accidents, and outnumbered the passenger cars earlier, have almost disappeared from traffic scene. The new driver cohorts have had time to gain necessary experience, and less importantly, the patrol service has been tightened and much of road police's technical equipment replaced.

Contributing directly to mortality, the increase in motorisation has been paralleled with victimisation in road accidents. In Estonia the rapid increase in the number of persons killed started in 1988 and peaked in 1991, in these few years the number of traffic deaths more than doubled (Figure 9). Comparison of this trend with the dynamics of motorisation reveals that growth in the number of deaths has been much faster than in number of cars over the same period, suggesting the shift towards increasingly aggressive traffic behaviour. To some extent, this shift could be related to the characteristics of newly car-owners. Available data on the age distribution of victims generally support the idea about young people with limited experience, whom the transition had overnight provided access to powerful cars, having been the primary risk group. On the other hand, the greatest relative increase in traffic death rates observed in age group 35-44 underlines to our opinion the misuse of opportunities which cannot be reduced to the simple lack of experience.

Figure 9 VICTIMISATION IN ROAD ACCIDENTS
Estonia 1989-1996



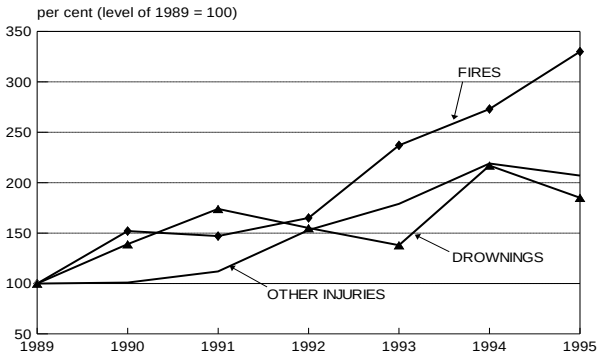
The aggressiveness of traffic behaviour is also revealed by the ratio of killed and injured persons. While earlier injured persons outnumbered the killed by up to eight times, the ratio dropped almost twice in 1990-1991. During these years the number of persons killed in traffic accidents exceeded for the first time ever the traditionally high number of suicides and became the single most important cause of violent deaths in Estonia. In 1992, the initial upsurge in both deaths and injuries was replaced by reduction, however, this was evidently achieved not due to improved safety measures. Confirmed by energy statistics, the explanation comes rather from the disruption of oil imports and price shock following the adjustment to world market fuel prices and correspondingly decreased traffic intensity. The years 1993-1994 witnessed again growth in human losses which also cannot

be related to safety. In the more recent years, victimisation in road accidents continued to decline and noticeably, the number of traffic deaths in 1996 is the second lowest record since early seventies. Although the survey data have indicated some improvement in traffic-related behaviour compared to the early nineties [Lipand et al. 1995], systematic efforts are required to make the recent positive tendencies sustainable.

2.2.3. Environmental Safety

Criminal and traffic safety have been the two single most important aspects, contributing directly to the increase in violent deaths. Behind both of them lies the general deterioration of the personal safety. Direct effect in mortality can be quantified at least in two other directions of societal environment, drownings and fire accidents. In those areas, as in many similar ones, the public behaviour has not specifically changed during transition and also, there was no principal need for the reorganisation of institutional framework. However, the rapid decrease of budgetary financing and introduction of commercial orientation has limited the public capacity to secure the safety of social environment.

igure 10 DROWNINGS, FIRE ACCIDENTS AND OTHER INJURIES
Estonia 1989-1996



Prior to transition, life-saving water-service in Estonia was managed by centralised organisation. In the course of transition the responsibility was given to local communities, and considering their uneven possibilities, the availability of the service has differentiated. In rural areas, economic difficulties have lead to the closure of significant proportion of swimming-pools which formerly were used for primary training. Removal of strict border regime has opened Estonian shores to increased small boat traffic, the analysis of fatal boat accidents shows that most of the victims have ignored elementary precaution measures (use of life-vests etc). This problem is likely to become more urgent in future when the improvement of economic conditions initiates growth in the number of privately-owned watercrafts, comparable to one observed in passenger cars. In fire-fighting service, on the contrary, the centralised organisation has been preserved, however the financial limitations have lead to similar results. Analysis performed by Rescue Department shows the neglect of safety measures at specific works and disorders of electrical equipment being responsible much of the increase in fire accidents, clearly indicating the weakening of preventive inspection. Particularly short has the capacity fallen in new businesses and organisations.

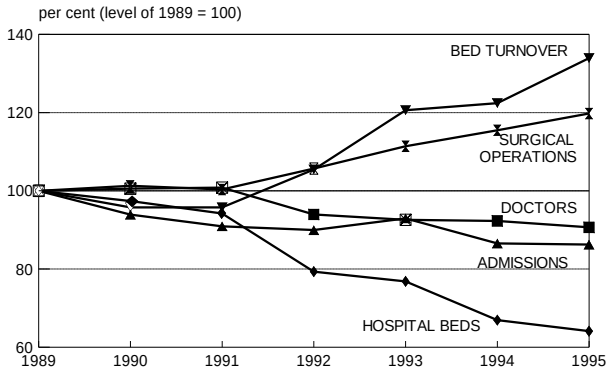
The mortality impact of discussed aspects of public safety is reflected in the dynamics of drownings and fire accidents. Although shaped by remarkable annual variation by climatic conditions, on the average the number of drownings has increased more than twice between 1989-1994 (Figure 10). Composition of victims reveals the increase being concentrated among prime-age males whereas the number of accidents with children has decreased. Typically, the fatalities in this group result from the combination of poor

swimming skills combined with alcohol. Regarding fire accidents, the increase has been even more persistent. The number of persons killed in fires peaked in 1995, exceeding the number of victims in 1989 more than threefold. Similarly to drownings, the increase in victimisation concentrates among prime-age men. Comparable trends are also characteristic to various other violent deaths, including deaths due to electric shocks, extreme temperature, falls etc.

2.3. Medical Care Availability

The foundations of the health care system, applied in Estonia during the Soviet period, originated from the domination of pre-transitional and transitional mortality when the primary concern were various exogenous death causes. The emphasis of medicine was the treatment of every illness as a separate case rather than an individual with specific progression of health statuses during life course. Under such orientation, the priority was given to quantitative aspects of health care system such as the number of medical doctors, medium-level personnel and hospital beds. According to available statistics referred target indicators increased systematically throughout the entire postwar period, peaking just in the 1980s [ESA 1962-1991]. The same indicators demonstrate the superiority of Estonia's health care over most, if not all developed countries. However, as analysed in the preceding section no effect of the system can be traced in mortality levels. If somebody attempts to identify the positive effect, one has to admit the hypothesis that the contribution of medical system exactly outweighed the impact of unspecified negative factors, continuously during the three decades. With such a long-term experience, the discussion of medical system could be omitted, despite traditional approach. Still it may be possible that during transition period the medical system has had specific effect on mortality. The discontinuity of services could, firstly, have shortened the duration between the onset of endogenous illnesses and death, and secondly, increased the fatality risk of acute cases. Given such hypothesis, the reorganisation of medical system can prove useful.

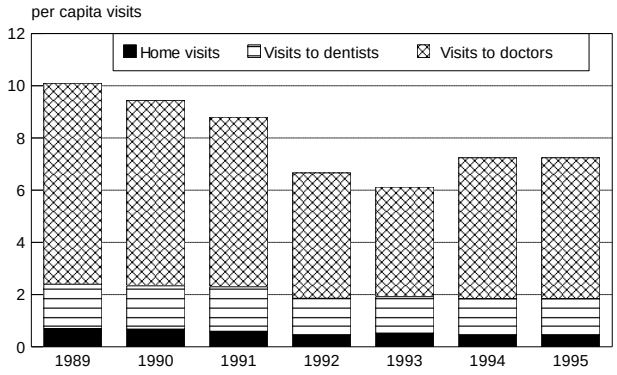
Figure 11 UTILISATION OF INPATIENT CARE
Estonia 1989-1995



In Estonia, the reform of health care system has been understood primarily as the transition to financing system based on insurance payments [World Bank 1993]. The number of physicians has dropped by more than 10 per cent with the biggest reduction taking place in 1992-1993. Aggravating the already distorted ratio of nurses to doctors, the number of medium-level medical personnel has declined to even greater extent. The stock of hospital beds has been cut by more than third, mostly due to conversion of many small and poorly equipped hospitals into the institutions of long-term care (Figure 11). As these massive declines in bedstock were paralleled by the shortening of average stay, the number of hospital admissions was reduced only less than 15 per cent; the number of surgical operations increased in all types, except gynecological and obstetrical. In 1989-

1995 the total number of visits to doctors dropped by 30 per cent, in absolute terms from 7.7 outpatient visits per inhabitant 5.4 remained. Evaluating the decline, however, one should notice that in the late 1980s just less than two thirds of visits were related to specific health problems, one third involved qualification for studies, specific occupations, driving licenses, foreign travel etc; in the course of transition, particularly the latter segment has shrunken excessively [EMSB 1996]. Declining frequency of visits is reflected in the answers to biannual health interview surveys, conducted since 1990 in cooperation between Estonian authorities and Finnish Public Health Institute [Lipand et al. 1995].

Figure 12 UTILISATION OF OUTPATIENT CARE
Estonia 1989-1995



Despite concerning a small fraction of the system, attention should be paid to the decline in emergency services. Between 1989-1992 the number of persons receiving aid dropped by one fourth, however, considering the increase in disease prevalence, the decline was even steeper. Partly it could be explained by the shortage of supplies and gasoline, in implementing the health care reform the emergency services were of low priority or even neglected for some period. Another concern in terms of mortality implications has been change in availability of pharmaceuticals. In centrally planned economies, assortment limitations existed even in case of no acute shortage, contributing to rather stereotypic application of pharmaceuticals. There was a relatively short period when the acute shortage emerged [World Bank 1993] but probably the more important impact has been mediated through the breakdown of referred stereotypes. In subsequent years the assortment of drugs has improved significantly, and now the availability is restricted by purchasing power. While drugs to hospital inpatients are provided free of charge, outpatient prescriptions must be covered by recipients (except in limited cases determined by the Ministry of Social Affairs). The consequences of the new situation are visible in dental care where individuals have to choose between better quality of paid service and lower standards and/or queuing for public service.

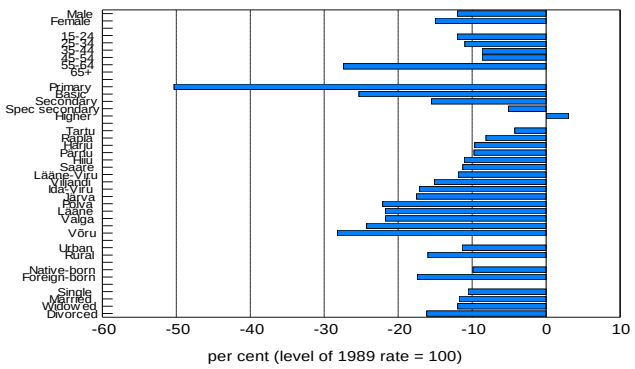
As stated above, the changes in health care system can be hypothesised to have affected mortality in two directions. Firstly, the discontinuity of the system could have shortened the duration between the onset of endogenous illnesses and death. In case some illness had progressed to the stage which requires regular medical assistance and application of drugs, delay in service or gap in supply could have posed direct threat on the life of individual. The frequency of such situations has surely increased during transition, particularly due to the reduction of emergency service and modification of pharmaceutical availability. From population perspective, the potentially affected group is formed by persons already carrying chronic illness. For this group, the progression of disease could have accelerated, and in some cases resulted in premature death. According to the approach, commonly accepted in demography, referred development means the reduction of unhealthy life expectancy, even in case of unchanged healthy life-span. Construction of such life tables requires rather sophisticated data on population health status which have never been available in Estonia.

Secondly, the transitional period could have increased the fatality risk of acute cases. This hypothesis concerns the entire population, including individuals relatively of good health. On one hand, various types of accidents have increased and on the other hand emergency services have decreased. Regarding serious injuries, the absence of immediate and appropriate care could have contributed to the frequency of fatalities. Similarly to accidents, the linkage could be expected in case of heart attacks. In such cases, however, it proves very hard or in many cases even impossible to establish whether the death had been caused by delayed medical intervention. Still, the decrease in traditional indicators of medical care system seems rather difficult to be associated with population health crises, as despite reductions, Estonia holds favourable position in these measures compared to many countries with remarkably higher life-expectancy. In longer run, however, without the reorientation of health care, the improvement in population health status and mortality pattern can hardly be achieved.

2.4. Economic Transformation and Differentiation of Population

Necessitated by the incapacity of centrally planned economies to maintain sustainable growth, transition has involved principal transformation of economic realities. Apart from other aspects of transition, economic transformation has concerned virtually entire population. The impact of economic transition in Estonia can be regarded stronger than in transitional economies on the average for several reasons. On one hand, as the part of the Soviet Union Estonia's economy had departed much more from market principles than in European communist countries outside USSR. On the other hand, Estonia opted quite radical economic policies. The large changes have confronted the population with the need to adapt to extensive modification of work opportunities. Measured by net sectoral shift summarising the change in the proportion of declining and expanding sectors, only Hungary seems to have experienced greater redeployments since the late 1980s [Puur 1997]. As a result, virtually entire working-age population has been necessitated to change jobs during the period.

Figure 13 CHANGE IN EMPLOYMENT LEVELS
Estonia 1989-1994

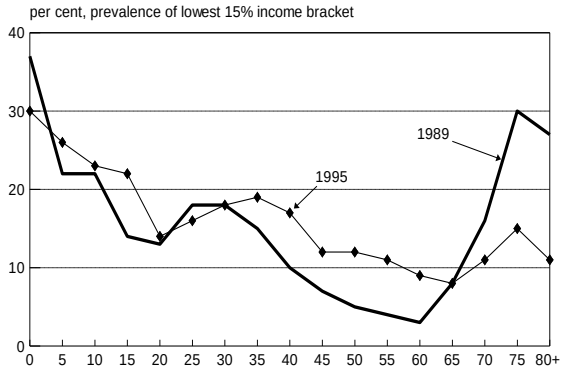


Extensive restructuration has been accompanied in Estonia with cumulative decline in GDP close to 40 per cent which was about twice higher than for advanced reformers of Central Europe [UN ECE 1995]. Decline in the outputs was paralleled by decrease in the demand for labour, resulting in reduction of employment for 22 per cent between 1989-1994. Consideration of consumer price index reveals that real wages dropped over 60 per cent in Estonia. Following the general pattern of macro-economic stabilisation, economic adjustments peaked in Estonia during 1992, recent years have shown recovery in key economic indicators [Ministry of Economics 1996]. Compared to countries like Czech Republic, Hungary and Poland, Estonia has witnessed greater declines in real incomes.

The process has been paralleled with sharp increase of income inequality: in 1989-1995 relative position has improved for the upper 20 per cent of households and deteriorated for the other 70 per cent of households. The ratio of incomes in the lowest and highest deciles has increased from five to twelve times. Comparison of Gini coefficients reveals the income inequality in Estonia being comparatively high among transition economies [UNICEF 1995].

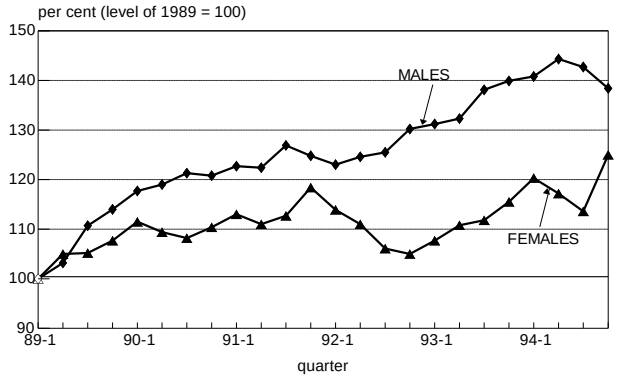
The principal new feature during economic transition has been the emergence of unemployment. In Estonia, the information on developments could be sought from the Estonian Labour Force Survey which until now is the only source offering the possibility to overcome the methodological discontinuity [Puur, Noorkõiv 1996]. Trends in age-specific employment rates reveal the loss of employment opportunities being sharpest among older population: relative to 1989 the level has dropped by one fourth around retirement age while in prime working age the reduction of employment has been limited to 5-8 per cent (Figure 13). Structurally, the excessive employment reductions have been supported by lower educational attainment and concentration in shrinking sectors. Across entire age-scale unemployment is associated with low levels of education, peaking among population with primary education. Another concentration of risk is related to primary economic sector where more than half of jobs have been lost, the same process has introduced sharp regional heterogeneity. Also, according to ELFS the foreign-born population with 17 per cent of loss in employment have been less successful. Loss of employment generally leads to significant fall in income and consumption levels, and therefore, the income experience of population follows quite closely the pattern of employment reductions. Income decline is located between ages 50 and 75, with particularly large drop in age group 60-69. Relevant from mortality perspective, the prevalence of lowest household income is largely revealed increase in ages 35-60 (Figure 14). In advanced ages the incidence of poverty has increased, due to revised pension scheme.

Figure 14 PREVALENCE OF LOW HOUSEHOLD INCOME
Estonia 1989 and 1995



In contrast to the emergence of unemployment, transition has affected the most active segments of population by considerable intensification of work patterns. In Estonia both women and men demonstrate increase in levels of second-job employment, however for males, the growth has been more consistent and reached much higher levels. In 1995, more than third of men and fourth of women reported working hours exceeding the normal 40 hours per week. Men in their late twenties and thirties have the highest propensity to extend their working hours beyond the conventional limit. As age increases the prevalence declines. Among women working extended hours is much less common, suggesting men being at much higher burnout risk.

Figure 15 CHANGE IN SECOND JOB EMPLOYMENT
Estonia 1989-1994



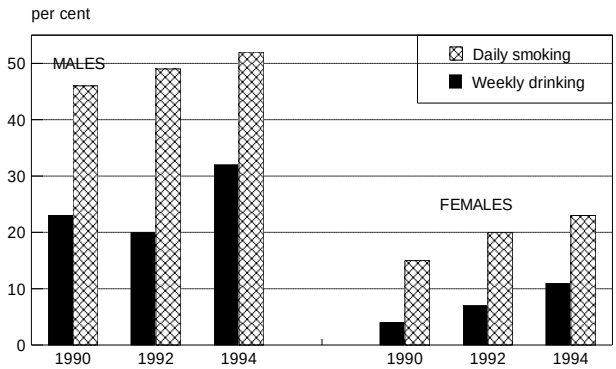
Consideration of mortality implications should take into account the growing risks related to both un(der)employment and overemployment. The deterioration of living standards has been traditionally emphasised for its adverse impact. The same holds evidently true also in Estonia, particularly for the novelty of situation. Individuals are faced with situations for which old coping behaviours appear useless and new survival strategies are not yet discovered. The result is considerable anxiety and stress which has been increasingly recognised as a contributing factor to sudden deaths due to cardiovascular diseases [Cornia 1996]. Although less traditional, similar impact may be assumed from the contrary situation, overemployment. Clearly, the individuals engaged in highly intensive work are left with less time for recuperation. Health surveys reveal significant reduction in leisure time activity, between 1990 and 1994 the proportion of adult population engaged in regular physical exercise has dropped by two thirds [Lipand et al 1995]. Under these conditions, psychosocial tension may well lead to increased consumption of stress-relievers.

Discussed linkages cannot be quantitatively measured in Estonia because of data limitations. They are assumed to operate through specific population groups, unemployed, poor as well as overemployed. Naturally, the affiliation to these groups cannot be identified from death certificate but requires merging the data from other sources containing information on economic characteristics, desirably in longitudinal perspective. Such a need is taken into account in conducting ELFS, however, it takes time until the required number of death cases will cumulate.

2.5. Traditional Risk Factors

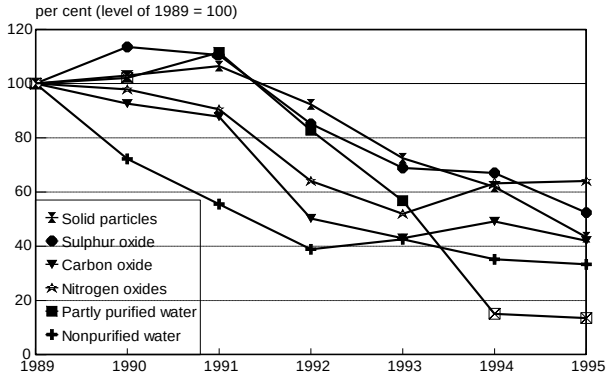
Discussion of population's health traditionally involves smoking, alcohol consumption, diet and environmental pollution as potential risk factors for illnesses. Evidence from health surveys suggests relatively high prevalence of male smoking and moderate female smoking in Estonia. Differently from some developed countries there are no signs of stabilisation in smoking prevalence (Figure 16). Among adult males daily smokers accounted for 52 per cent and 23 per cent among females. Most dedicated smokers are middle-aged men, in age 35-44 only less than third of them did not currently smoke. Permissive attitudes add to this significant passive exposure to tobacco smoke, combined with non-restricted aggressive marketing of international tobacco companies. Also, the use of alcohol shows no decrease. Despite significant improvements in assortment, consumption pattern continues to be biased towards strong alcohol in Estonia. Similarly to smoking, excessive drinking tends to be concentrated among middle-aged men, in age 35-44 two in every five men reported weekly drinking of vodka or other strong alcohol.

Figure 16 SMOKING AND ALCOHOL CONSUMPTION
Estonia 1990-1994



Regarding dietary habits, the developments appear poorly documented. During transition period significant reductions in consumption eggs, meat and milk products can be observed. According to rough estimates per capita consumption of milk products was reduced by one third while that of eggs and meat products to even greater extent between 1989 and 1992. Following the currency reform in 1992, the supply and assortment of food products has improved tremendously, however, accompanied with the emergence of income limitations. Ministry of Social Affairs has estimated the food consumption of at least 30 per cent of households below the minimum food basket established in 1989 [UNDP 1996]. Restructuration of economy, particularly the decline in primary and secondary sectors has been accompanied with considerable decrease in the environmental pollution (Figure 17). Since 1989 the amount of pollutants emitted in the air by stationary sources has been halved. Regarding water, its consumption has decreased by two fifths. Particularly large improvements have been achieved due to reduction and changed pattern in agricultural activities, particularly the use of pesticides and mineral fertilizers.

Figure 17 EMISSION OF AIR AND WATER POLLUTANTS
Estonia 1989-1995



Despite widely accepted negative influence, due to cumulative effect smoking affects health through considerable time-lag. For example, with lung cancer trends the impact can be measured only from twenty years perspective. Alcohol consumption, however, can be associated with current mortality levels through violent deaths. In addition to abovediscussed traffic accidents, homicides, fires and other fatalities, this immediate effect is most clearly represented in alcohol poisonings. In Estonia, the rise started in 1990 and peaked during 1994. Poisonings could be complemented with deaths due to chronic alcoholism, alcoholic psychosis and alcohol-related *cirrhosis hepatitis*. All together, direct losses due to alcohol had increased more than three times in six years. It is unfortunate that the official alcohol consumption statistics is based on sale information, its rise in Estonia reflects far more the fluctuations in the number of vodka tourists than actual consumption. Moreover, much of the alcohol poisonings occur due to various substitutes preferred among rather narrow segment of underworld population. The long-term exposure to smoking and alcohol may have affected transitional mortality through previously weakened health status, limiting the ability of population to adjust to stressful new situations and avoid pathogenic developments. Drop in food expenditure in Estonia has been far from introducing the health risk due to insufficient calorie intake. Leaving aside the poorest segment of population, market reforms in general seem to have improved rather than worsened the

nutritional balance, particularly with regular access to fresh fruits and vegetables. Decline in the consumption of meat products, traditionally pork in Estonia, has presumably reduced the intake of saturated fats, thus hopefully contributing to lower risks of cardiovascular mortality in future.

2.6. The model

The project outline foresaw the application of formal statistical model for the quantification of causal linkages. For the study of current health crises such an approach could provide, in case longitudinal data on social, economic and health characteristics of individuals can be merged with mortality information for the same individuals, valuable insight. However, the data limitations did not permit to apply this approach to the Estonian setting. Moreover, consistent time series covering longer time-span are not available even on simple aggregate-level socio-economic indicators. Anyway to meet the key comment of project coordinator, the model regressing potential risk factors. The specification of the linear regression model is as follows:

$$Y_{kt}=f(Y_{k89},X_{1kt}...X_{nkt})$$

The model builds on regional variation among 15 Estonian counties. The dependent Y_{kt} variable refers to the change in age-specific mortality rates between 1989-1995, based on five-year age groups separately for males and females. The set of independent variables X_{1kt} attempts to incorporate different dimensions of risk factors which have been considered relevant from the perspective of psycho-social stress hypothesis, proposed as theoretically most appropriate for explaining the transition's mortality crisis [Cornia 1996]. Independent variables include change in crude divorce rate, change in number of hospital beds and change in the number of medical doctors, change in unemployment rate and change in the percentage of housing allowance recipients and proportion of foreign-born population. In terms of sources, dependent variables were derived from population census, vital statistics, surveys and administrative records. Information on intermediary variables, such as alcohol consumption, drugs, cigarettes and other perceived stress relievers was not available on county level. To control for the difference in starting conditions, the model also incorporates the variable Y_{k89} which presents the regional variation in age-specific mortality at starting point. The regressions were run separately for males and females as well as age groups 0-14, 15-29, 30-49, 50-69 and 70+, regression coefficients are presented in Table 19.

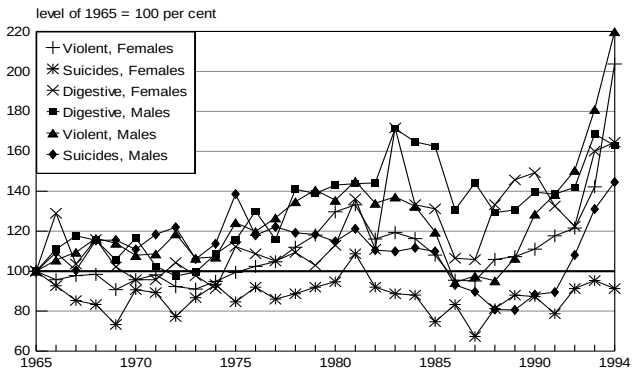
The direction and magnitude of regression coefficients varies significantly across subpopulations. Two indicators, the change in the number of medical doctors and bedstock seems to work in similar direction across the entire age-scale. The decline in bedstock is correlated with mortality increase both for males and females which could be regarded as understandable. Moving to another traditional indicator of medical system, the number of doctors, the correlation into the same direction was found for females. Turning to males, however, the decline in the number of doctors seems to contribute to higher life expectancy which holds true for the older women as well. The previous analysis has demonstrated that the increase of mortality in the period of societal transition is carried by male population, according to the model because of too slow decline in the number of doctors. Among the economic indicators, the number of housing allowance recipients is

positively correlated with increase in mortality levels, which hopefully does not mean the impact of referred social policy measure. The increase in unemployment seems to shorten the life expectancy among males, however for females, the impact is positive. Of course, such kind of inconsistency of regression results would have been avoided by omitting the basic demographic dimension of mortality, age and sex, into dependent variable.

3. DISCUSSION

Mortality analysis presented in the paper gives a ground to assume that the mortality increase in Estonia during current societal transition should be considered in the context of long-term period of mortality stagnation rather than the recent short-term period of relatively rapid changes. In recent transition only the levels have been influenced while the long-term stagnation had affected the whole mortality pattern. Under such circumstances, the underlying determinants of current health crises could hardly be found "inside" the transition period. Naturally, through specific death causes there has been a direct impact of certain social distresses but the general explanation of the existing mortality pattern should be sought from broader long-term social context. Such understanding is also consistent with basic features of post-transitional mortality, according to which deaths due to endogenous causes result from gradual accumulation of the impact of social environment, not the immediate influence of some extreme conditions. These accumulation mechanisms are particularly relevant for cardiovascular diseases and cancer accounting for more than three fourths of all deaths under modern mortality regime. From another perspective, these mechanisms draw attention to the particular importance of cohort effects. The cohorts under interest have been subjected to specific societal environment, briefly the soviet regime. Population cohorts have been influenced by this environment with varying intensity and duration and accumulated its influences to the different extent. In short, this influence has preserved the causal structure of modern mortality but enforced the earlier realisation of endogenous death causes. If this hypothesis holds true, it is realistic to expect that the mortality stagnation can be fully overcome only in 50-60 years, whatever the speed of societal normalisation and extension of economic opportunities.

Figure 18 STANDARDISED MORTALITY RATES BY CAUSES
Estonia, 1965-1994



This hypothesis is supported by the development of cardiovascular mortality. During the transition the relative increase in mortality levels from those diseases was negligible compared to other main cause groups. However, it was not negligible across the age scale: mortality has grown in middle ages and decreased in older age groups. Assuming the period effect, exactly the opposite development could have been expected. What happened in reality was the rejuvenation of cardiovascular deaths, leading to the accumulation at ages where the rejuvenation stopped, i.e around ages 35-45. Less expressed, similar development can be hypothesised concerning cancer mortality.

Another pattern is demonstrated by those causes of deaths for which the time-lag between the impact of societal environment and fatal outcome is shorter or immediate. Taking into account longer period, the mortality trend of such causes could be clearly divided into three subperiods: gradual increase, or for some causes stability, up to the mid-1980s, relatively sharp decline during the second part of 1980s, and the new increase in the 1990s (Figure 18). Most of the inrease during the societal transition can be explained simply by resumption of the previous trends broken in the mid-1980s. The same figure emphasis the threat to researchers who limit their interest exclusively to transition period. They are observing the dramatic growth in discussed death causes. The risk to end in such situation is strengthened by data limitations concerning long-term trends. In case of Estonia the data on age-specific data on mortality is available in long run but consistent time series on social and economic indicators are missing.

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STATISTICAL APPENDIX

Table 1. LIFE EXPECTANCY AT BIRTH, Estonia, census years 1897-1989

Year	Males	Females
1987	41.87	45.50
1922	48.65	54.92
1934	57.93	59.60
1959	64.31	71.62
1970	65.34	74.41
1979	64.21	74.35
1989	66.15	74.97

Source: Katus and Puur, 1991; 1992.

Table 2. LIFE TABLE, Estonia, 1988/89

Age group	m(x)	q(x)	l(x)	d(x)	L(x)	s(x)	T(x)	e(x)	a(x)
				Males					
0	0.01591	0.01568	100000	1568	98569	0.98245	6615128	66.15	0.09
1	0.00114	0.00455	98432	448	392655	0.99570	6516559	66.20	1.61
5	0.00066	0.00329	97984	323	489114	0.99676	6123904	62.50	2.50
10	0.00064	0.00319	97661	312	487527	0.99540	5634790	57.70	2.50
15	0.00133	0.00663	97349	645	485285	0.99156	5147264	52.87	2.74
20	0.00201	0.01000	96704	967	481188	0.98980	4661979	48.21	2.59
25	0.00209	0.01040	95737	995	476280	0.98736	4180790	43.67	2.59
30	0.00310	0.01539	94741	1458	470259	0.98217	3704510	39.10	2.64
35	0.00413	0.02045	93283	1908	461873	0.97616	3234251	34.67	2.62
40	0.00569	0.02808	91376	2565	450861	0.96427	2772377	30.34	2.65
45	0.00915	0.04479	88811	3978	434751	0.94551	2321516	26.14	2.66
50	0.01355	0.06566	84833	5570	411063	0.91754	1886765	22.24	2.65
55	0.02134	0.10155	79263	8049	377166	0.88017	1475702	18.62	2.62
60	0.03000	0.13985	71214	9959	331972	0.83640	1098536	15.43	2.58
65	0.04236	0.19201	61255	11762	277661	0.77074	766564	12.51	2.57
70	0.06329	0.27366	49493	13544	214005	0.68160	488903	9.88	2.53
75	0.09193	0.37301	35949	13409	145865	0.56554	274898	7.65	2.47
80	0.13977	0.51155	22539	11530	82492	0.42258	129033	5.73	2.38
85	0.20945	0.66320	11009	7301	34860	0.25098	46541	4.23	2.24
90	0.31743	-	3708	3708	11681	-	11681	3.15	-
				Females					
0	0.01132	0.01120	100000	1120	98973	0.98717	7496784	74.97	0.08
1	0.00092	0.00367	98880	363	394613	0.99675	7397811	74.82	1.51
5	0.00049	0.00245	98517	241	491980	0.99803	7003198	71.09	2.50
10	0.00030	0.00150	98276	147	491009	0.99781	6511218	66.25	2.50
15	0.00062	0.00310	98128	304	489936	0.99661	6020208	61.35	2.68
20	0.00071	0.00354	97824	347	488276	0.99616	5530273	56.53	2.56
25	0.00083	0.00414	97478	404	486402	0.99563	5041997	51.72	2.56
30	0.00093	0.00464	97074	450	484277	0.99485	4555595	46.93	2.57
35	0.00119	0.00593	96624	573	481782	0.99201	4071318	42.14	2.67
40	0.00211	0.01050	96050	1008	477933	0.98699	3589536	37.37	2.70
45	0.00318	0.01578	95042	1500	471714	0.98036	3111604	32.74	2.67
50	0.00492	0.02432	93542	2275	462450	0.96825	2639889	28.22	2.69
55	0.00825	0.04048	91267	3694	447768	0.94957	2177440	23.86	2.68
60	0.01276	0.06195	87573	5425	425185	0.92205	1729672	19.75	2.66
65	0.02053	0.09798	82147	8049	392043	0.86992	1304486	15.88	2.68
70	0.03674	0.16910	74099	12530	341045	0.78754	912443	12.31	2.65
75	0.06085	0.26545	61569	16343	268586	0.66251	571398	9.28	2.60
80	0.10809	0.42529	45225	19234	177942	0.49928	302812	6.70	2.50
85	0.17499	0.59815	25991	15547	88843	0.28851	124870	4.80	2.36
90	0.28991	-	10445	10445	36026	-	36026	3.45	-

Source: Katus and Puur, 1991; 1992.

Table 3. LIFE TABLE BASED ON OFFICIAL POPULATION ESTIMATES, Estonia, 1994/95

Age group	m(x)	q(x)	l(x)	d(x)	L(x)	s(x)	T(x)	e(x)	a(x)
				Males					
0	0.01650	0.01626	100000	1626	98519	0.98152	6163849	61.64	0.09
1	0.00134	0.00534	98374	526	392238	0.99525	6065330	61.66	1.60
5	0.00067	0.00334	97849	327	488426	0.99676	5673091	57.98	2.50
10	0.00063	0.00315	97522	307	486841	0.99470	5184665	53.16	2.50
15	0.00172	0.00857	97215	833	484263	0.98802	4697824	48.32	2.83
20	0.00305	0.01514	96382	1459	478460	0.98391	4213562	43.72	2.64
25	0.00341	0.01691	94923	1605	470763	0.97937	3735101	39.35	2.60
30	0.00514	0.02540	93317	2370	461051	0.96832	3264338	34.98	2.66
35	0.00789	0.03873	90948	3522	446446	0.95350	2803287	30.82	2.65
40	0.01121	0.05458	87425	4772	425684	0.93859	2356841	26.96	2.60
45	0.01443	0.06975	82653	5765	399543	0.91193	1931157	23.36	2.62
50	0.02301	0.10904	76888	8384	364353	0.87587	1531614	19.92	2.60
55	0.02996	0.13957	68504	9561	319125	0.84013	1167261	17.04	2.55
60	0.04006	0.18222	58943	10740	268107	0.79908	848136	14.39	2.52
65	0.04986	0.22161	48203	10682	214239	0.75525	580029	12.03	2.49
70	0.06394	0.27573	37521	10346	161803	0.67285	365789	9.75	2.51
75	0.09735	0.39001	27175	10598	108870	0.56343	203986	7.51	2.45
80	0.13443	0.49745	16576	8246	61341	0.42267	95117	5.74	2.39
85	0.21772	0.67760	8330	5645	25927	0.23239	33776	4.06	2.21
90	0.34216	-	2686	2686	7849	-	7849	2.92	2.92
				Females					
0	0.01305	0.01290	100000	1290	98825	0.98570	7418938	74.19	0.09
1	0.00083	0.00331	98710	327	394025	0.99738	7320114	74.16	1.50
5	0.00029	0.00145	98383	143	491560	0.99885	6926089	70.40	2.50
10	0.00017	0.00085	98241	83	490995	0.99834	6434529	65.50	2.50
15	0.00056	0.00280	98157	275	490182	0.99670	5943534	60.55	2.80
20	0.00072	0.00359	97883	352	488565	0.99607	5453351	55.71	2.59
25	0.00086	0.00429	97531	419	486645	0.99524	4964786	50.90	2.59
30	0.00110	0.00549	97112	533	484327	0.99237	4478141	46.11	2.68
35	0.00207	0.01030	96580	995	480630	0.98685	3993814	41.35	2.72
40	0.00323	0.01603	95585	1532	474310	0.98171	3513184	36.76	2.64
45	0.00420	0.02079	94053	1956	465636	0.97434	3038874	32.31	2.63
50	0.00639	0.03148	92097	2899	453685	0.96169	2573238	27.94	2.65
55	0.00939	0.04593	89198	4097	436306	0.94516	2119553	23.76	2.64
60	0.01350	0.06542	85101	5567	412380	0.91824	1683247	19.78	2.64
65	0.02128	0.10132	79534	8058	378666	0.87547	1270866	15.98	2.64
70	0.03295	0.15282	71476	10923	331512	0.80667	892200	12.48	2.63
75	0.05571	0.24603	60553	14898	267421	0.67714	560688	9.26	2.63
80	0.10616	0.42107	45655	19224	181082	0.47695	293268	6.42	2.55
85	0.20003	0.65362	26431	17276	86367	0.23014	112186	4.24	2.35
90	0.35459	-	9155	9155	25819	-	25819	2.82	2.82

Source: Calculations of the authors

Table 4. LIFE TABLE BASED ON REVISED POPULATION ESTIMATES, Estonia, 1994/95

Age group	m(x)	q(x)	l(x)	d(x)	L(x)	s(x)	T(x)	e(x)	a(x)
				Males					
0	0.01650	0.01626	100000	1626	98519	0.98157	6232427	62.32	0.09
1	0.00131	0.00522	98374	514	392266	0.99541	6133907	62.35	1.60
5	0.00063	0.00315	97861	308	488533	0.99698	5741641	58.67	2.50
10	0.00058	0.00290	97553	282	487058	0.99506	5253107	53.85	2.50
15	0.00162	0.00807	97270	785	484650	0.98861	4766049	49.00	2.83
20	0.00292	0.01450	96485	1399	479131	0.98434	4281399	44.37	2.65
25	0.00335	0.01662	95086	1580	471630	0.98036	3802268	39.99	2.59
30	0.00475	0.02349	93506	2196	462368	0.97096	3330638	35.62	2.65
35	0.00720	0.03540	91310	3232	448940	0.95742	2868270	31.41	2.65
40	0.01028	0.05017	88078	4419	429824	0.94305	2419330	27.47	2.61
45	0.01348	0.06531	83659	5464	405347	0.91639	1989506	23.78	2.63
50	0.02200	0.10451	78195	8172	371454	0.88092	1584159	20.26	2.61
55	0.02867	0.13398	70023	9381	327220	0.84513	1212704	17.32	2.56
60	0.03901	0.17790	60641	10788	276542	0.80381	885485	14.60	2.53
65	0.04849	0.21621	49854	10779	222286	0.76077	608943	12.22	2.50
70	0.06238	0.26997	39075	10549	169109	0.67934	386656	9.90	2.51
75	0.09500	0.38260	28526	10914	114883	0.57070	217547	7.63	2.46
80	0.13165	0.49009	17612	8631	65564	0.43059	102664	5.83	2.39
85	0.21278	0.66890	8981	6007	28231	0.23906	37100	4.13	2.23
90	0.33526	-	2973	2973	8869	-	8869	2.98	2.98
				Females					
0	0.01305	0.01290	100000	1290	98825	0.98572	7454396	74.54	0.09
1	0.00082	0.00327	98710	323	394035	0.99743	7355571	74.52	1.50
5	0.00028	0.00140	98387	138	491592	0.99893	6961537	70.76	2.50
10	0.00015	0.00075	98250	74	491064	0.99847	6469945	65.85	2.50
15	0.00053	0.00265	98176	260	490312	0.99685	5978881	60.90	2.82
20	0.00069	0.00344	97916	337	488769	0.99619	5488569	56.05	2.60
25	0.00084	0.00419	97579	409	486905	0.99544	4999800	51.24	2.58
30	0.00103	0.00514	97170	499	484685	0.99293	4512895	46.44	2.67
35	0.00191	0.00951	96671	919	481257	0.98781	4028209	41.67	2.72
40	0.00301	0.01494	95751	1431	475390	0.98279	3546953	37.04	2.65
45	0.00399	0.01976	94320	1864	467208	0.97528	3071563	32.56	2.64
50	0.00621	0.03061	92456	2830	455659	0.96271	2604355	28.17	2.66
55	0.00914	0.04473	89627	4009	438666	0.94635	2148696	23.97	2.64
60	0.01324	0.06420	85617	5496	415132	0.92002	1710030	19.97	2.64
65	0.02073	0.09882	80121	7917	381931	0.87846	1294898	16.16	2.64
70	0.03213	0.14930	72203	10780	335511	0.81091	912967	12.64	2.63
75	0.05435	0.24074	61424	14787	272068	0.68422	577456	9.40	2.63
80	0.10312	0.41162	46637	19196	186155	0.48753	305388	6.55	2.55
85	0.19392	0.64137	27440	17599	90756	0.23883	119233	4.35	2.36
90	0.34558	-	9841	9841	28476	-	28476	2.89	2.89

Source: Calculations of the authors

Table 5. STANDARDISED MORTALITY RATE, Estonia 1989-1994

Cause of death	1989	1990	1991	1992	1993	1994
Males						
All causes	1530.0	1651.6	1653.7	1719.9	1822.1	1925.1
Neoplasms	295.7	288.9	320.1	305.8	315.3	295.8
Diseases of Circulatory System	871.0	935.5	879.1	921.9	933.6	971.6
Diseases of Respiratory System	51.3	54.2	54.3	53.1	58.7	79.2
Injuries and Poisonings	181.2	218.8	235.5	256.1	308.0	379.4
Females						
All causes	863.9	877.9	878.0	874.4	927.1	955.2
Neoplasms	153.5	146.2	159.3	149.6	155.3	150.7
Diseases of Circulatory System	560.3	560.1	539.3	537.5	563.4	564.9
Diseases of Respiratory System	16.6	16.7	14.8	14.6	16.9	18.2
Injuries and Poisonings	52.7	54.5	57.8	59.7	69.8	100.0

Source: Calculations of the authors

Table 6. LIFE EXPECTANCY AT BIRTH BY URBAN-RURAL RESIDENCE, Estonia 1969-1989

	Urban population	Rural population
1969/70	71.2	68.8
1970/71	71.1	69.1
1971/72	71.6	68.5
1973/74	71.7	69.4
1979/80	70.4	67.4
1981/82	70.3	67.6
1982/83	70.6	67.9
1984/85	70.6	67.6
1985/86	71.4	68.1
1987	71.7	69.3
1988	71.6	69.7
1989	71.3	69.0

Source: Unpublished tabulations from Statistical Office

Table 7. LIFE EXPECTANCY AT BIRTH BY ETHNICITY, Estonia, census years 1959-1989

	Estonians		Non-Estonians	
	Males	Females	Males	Females
1959	64.52	71.61	71.61	72.05
1970	65.86	74.63	74.63	73.94
1979	64.57	74.52	74.52	73.81
1989	66.40	75.53	75.53	73.64

Source: Katus and Puur 1991, 1992.

Table 8. LIFE EXPECTANCY AT BIRTH BY REGION, Estonia 1986/1991

County	Males	Females
Harjumaa	66.64	75.16
Hiiumaa	63.87	73.98
Ida-Virumaa	64.98	74.37
Jõgevamaa	63.75	73.91
Järvamaa	64.84	74.61
Läänemaa	63.60	73.45
Lääne-Virumaa	63.30	73.98
Põlvamaa	66.07	74.96
Pärnumaa	66.83	75.60
Raplamaa	64.19	75.42
Saaremaa	64.92	75.22
Tartumaa	66.53	76.19
Valgamaa	65.32	74.88
Viljandimaa	64.30	74.61
Võrumaa	64.86	75.27
Total	65.72	75.04

Source: EKDK 1994

Table 9. OFFENCES AGAINST PERSONS, Estonia 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Number of crimes							
Total registered crimes	19141	23807	31748	41254	37163	35739	39570
Intentional homicides, incl attempts	89	137	136	239	328	365	304
Aggravated assaults	147	134	158	223	220	248	223
Other assaults	176	155	165	154	158	163	184
Crude crime rate, per 100 thsd pop							
Total registered crimes	1220.2	1515.4	2026.9	2671.2	2450.2	2383.8	2666.5
Intentional homicides,inc attempts	5.7	8.7	8.7	15.5	21.6	24.3	20.2
Aggravated assaults	9.4	8.5	10.1	14.4	14.5	16.5	15.0
Other assaults	11.2	9.9	10.5	10	10.4	10.9	12.4
Number of cleared crimes							
Total registered crimes	6829	6395	5741	7089	9133	9546	11283
Intentional homicides,inc attempts	67	92	100	122	181	220	211
Aggravated assaults	...	...	76	148	100	138	140
Other assaults	...	...	70	18	86	88	102
Per cent of cleared crimes							
Total registered crimes	35.7	26.9	18.1	17.2	24.6	26.7	28.5
Intentional homicides,inc attempts	75.3	67.2	73.5	51.0	55.2	60.3	69.4
Aggravated assaults	...	...	48.1	66.4	45.5	55.6	62.8
Other assaults	...	...	42.4	11.7	54.4	54.0	55.4

Source: Calculations of the authors based on the data from Ministry of Interior

Table 10. MOTORISATION AND ROAD ACCIDENTS, Estonia 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Number of vehicles							
Passenger cars, thds	224.9	241.9	261.0	283.5	317.4	372.1	383.4
Buses, thds	7.7	8.2	8.6	8.4	8.7	6.9	7.0
Lorries, thds	45.6	47.3	58.9	62.7	62.9	61.1	65.7
Length of public roads, km	14800	14822	14816	14797	14771	14775	14992
with pavement, km	7948	7960	8016	8043	8059	8093	8102
Number of accidents							
Total registered accidents	1956	2099	1965	1167	1317	1584	1644
Persons killed	343	436	491	287	321	364	332
Persons injured	2252	2379	2175	1289	1502	1832	1894
Crude rate, per 100 thsd pop							
Persons killed	21.9	27.8	31.3	18.6	21.2	24.3	22.4
Persons injured	143.6	151.4	138.9	83.5	99.0	122.2	127.6
Ratio of killed to injured persons	15.2	18.3	22.6	22.3	21.4	19.9	17.5

Source: Calculations of the authors based on the data from Road Administration

Table 11. DEATH DUE TO DROWNINGS, FIRE ACCIDENTS, FALLS AND OTHER INJURIES, Estonia 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Number of deaths due to							
Drownings	113	157	197	175	156	245	209
Fires	69	105	102	114	164	189	228
Falls	176	172	175	184	212	270	216
Other injuries	248	251	280	383	449	552	520
Death rate per 100 thsd pop							
Drownings	7.2	10.0	12.6	11.3	10.3	16.3	14.1
Fires	4.4	6.7	6.5	7.4	10.8	12.6	15.4
Falls	11.2	10.9	11.2	11.9	14.0	18.0	14.6
Other injuries	15.8	16.0	17.9	24.8	29.6	36.8	35.0

Source: Calculations of the authors based on the data from Statistical Office

Table 12. HEALTH FACILITIES, Estonia 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Number of health workers							
Physicians	5706	5755	5750	5284	5117	5039	4894
Dentists	736	753	777	794	810	820	867
Medium-level personnel	14074	13896	13215	12206	12135	11594	11416
Health workers per 1000 pop							
Physicians	3.64	3.66	3.67	3.42	3.37	3.36	3.30
Dentists	0.47	0.48	0.50	0.51	0.53	0.55	0.58
Medium-level personnel	8.97	8.85	8.44	7.9	8.0	7.73	7.69
Inpatient care facilities							
Hospital beds	18709	18219	17626	14843	14377	12521	11994
Hospital admissions	308748	290015	280790	277744	287001	267240	266322
Bed days, thds	5347	5064.4	4805.1	4462.9	4421.4	3832.2	3384.4
Inpatient care facilities per 1000 pop							
Hospital beds	11.9	11.6	11.3	9.6	9.5	8.4	8.1
Hospital admissions	196.8	184.6	179.3	179.8	189.2	178.2	179.5
Bed days	3408.7	3223.6	3067.7	2889.8	2915.1	2556.1	2280.7
Hospital bed utilisation							
Bed occupancy, per cent	78.3	75.2	73.8	76.5	83.8	79.1	76.9
Average length of stay, days	17.3	17.4	17.1	16.1	15.4	14.2	12.7
Bed turnover	16.5	15.8	15.8	17.4	19.9	20.2	22.1
Surgical Operations	...	161334	161878	170524	179702	186287	193227
Outpatient medical care							
Outpatient visits, thds	12078.6	11085.6	10230.2	7399.4	7826.8	8029.3	8004.6
Home visits, thds	1098.7	1065.8	944.5	712.1	809	686.7	689.1
Visits to dentists, thds	2666.7	2614.8	2664.4	2155.7	2115.1	2068.6	2053.3
Emergency visits, thds	333.0	322.0	292.0	272.0	292.0	288.0	283.0
Outpatient care per 1000 pop							
Outpatient visits	7.70	7.06	6.53	4.79	5.16	5.36	5.39
Home visits	0.70	0.68	0.60	0.46	0.53	0.46	0.46
Visits to dentists,	1.70	1.66	1.70	1.40	1.39	1.38	1.38
Emercency visits	0.21	0.21	0.19	0.18	0.19	0.19	0.19

Source: Estonian Medical Statistics Bureau, 1995.

Table 13. INCOME INEQUALITY, Estonia 1989-1995

	1989	1992	1993	1994	1995
Per capita household income by income decile, roubles/kroons					
1st	62.2	35.0	165.8	209.7	286.5
2nd	89.5	61.4	255.0	362.9	515.5
3rd	106.5	78.9	301.3	444.0	618.8
4th	120.2	92.4	366.9	543.6	730.9
5th	133.6	110.3	430.1	640.5	871.8
6th	149.2	133.2	509.1	760.0	1041.5
7th	166.4	159.7	601.4	915.9	1243.3
8th	188.1	190.4	730.8	1108.1	1506.5
9th	223.5	244.3	934.2	1426.0	1916.6
10th	310.6	593.4	1770.3	2744.2	4434.5
Participation in total income by income decile, per cent					
1st	4.1	2.3	2.3	2.2	2.1
2nd	5.7	3.9	3.9	3.8	4.0
3rd	6.9	4.8	4.8	4.7	5.0
4th	7.7	5.7	5.8	5.7	5.7
5th	8.7	6.7	7.0	6.8	6.7
6th	9.5	8.0	8.3	8.1	8.0
7th	10.8	9.4	10.0	9.8	9.6
8th	12.1	11.5	12.0	12.1	11.9
9th	14.5	14.9	15.4	15.8	15.0
10th	20.0	32.7	30.5	31.0	31.6

Source: Family Income Survey '89 and Household Income and Expenditure Surveys '92-'95

Table 14. EMPLOYMENT AND UNEMPLOYMENT RATE, Estonia 1989 and 1995

Age	1989 employment			1995 employment			1995 unemployment		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
15-19	32.4	25.9	29.3	26.0	19.0	22.6	22.2	25.7	23.6
20-24	80.4	77.5	79.0	72.6	53.0	63.1	13.3	9.5	11.8
25-29	96.5	90.8	93.7	82.1	65.4	73.2	8.9	10.3	9.6
30-34	97.7	94.3	96.1	83.9	75.8	79.7	11.9	8.7	10.3
35-39	97.8	96.1	96.9	84.6	81.7	83.1	9.4	6.6	8.0
40-44	97.3	96.2	96.7	83.2	87.3	85.3	9.7	5.0	7.3
45-49	95.9	95.5	95.7	85.1	83.1	84.0	7.7	7.9	7.8
50-54	93.1	90.4	91.7	80.3	78.9	79.5	4.6	5.4	5.0
55-59	85.6	60.8	71.8	71.4	43.5	55.9	6.4	5.4	6.0
60-64	58.8	46.0	51.1	38.4	21.8	29.0	5.5	6.3	5.8
65-69	45.4	35.2	38.7	22.8	11.9	15.8	1.9	2.0	1.9
70-74	32.3	23.7	26.6	18.3	10.6	13.0	4.0	0.0	1.8
Total	81.1	72.7	76.6	66.8	54.9	60.3	9.6	7.7	8.7

Source: Census '89 and Labour Force Survey '95

Table 15. PREVALENCE OF LOW HOUSEHOLD INCOME, Estonia 1989 and 1995

Age	1989			1995		
	Males	Females	Total	Males	Females	Total
0-4	55.1	60.2	57.8	40.0	45.0	42.4
5-9	28	29.5	28.8	36.3	33.0	34.7
10-14	28.4	26.6	27.6	32.4	27.9	30.3
15-19	13.2	19.7	16.2	28.5	28.5	28.5
20-24	9.9	20.4	15.4	15.5	18.6	16.9
25-29	21.7	21.1	21.4	17.0	21.2	19.0
30-34	18.1	25.3	21.6	22.7	21.7	22.2
35-39	18.4	16.0	17.2	21.7	24.3	23.1
40-44	10.8	10.6	10.7	21.9	19.6	20.7
45-49	6.8	7.1	7.0	13.8	14.3	14.1
50-54	5.8	5.1	5.4	14.1	13.4	13.7
55-59	4.2	4.2	4.2	14.0	11.0	12.4
60-64	4.5	2.1	3.1	8.0	10.5	9.4
65-69	8.9	8.3	8.6	6.3	10.0	8.3
70-74	5.4	28.6	19.4	5.7	15.5	11.8
75-79	47.8	40.3	42.4	1.4	26.0	17.2
80+	57.9	32.6	37.1	17.2	10.2	11.7
Total	16.9	18.6	17.8	20.5	20.4	20.5

Source: Family Income Survey '89 and Labour Force Survey '95

Table 16. PREVALENCE OF SECOND JOBS AND EXTENDED WORKING HOURS, Estonia 1995

Age	Having a second job			Working extended hours*		
	Males	Females	Total	Males	Females	Total
15-19	12.0	2.5	16.7	15.8	12.3	14.2
20-24	11.5	7.5	9.9	32.3	20.5	27.5
25-29	12.7	10.9	11.8	40.7	24.6	33.1
30-34	14.9	16.2	15.5	40.2	24.7	32.5
35-39	16.3	11.0	13.6	39.9	26.9	33.2
40-44	14.9	14.1	14.5	35.6	24.2	29.5
45-49	13.1	13.4	13.3	33.5	30.0	31.7
50-54	12.8	12.5	12.6	35.6	23.8	29.3
55-59	10.4	8.9	9.7	24.4	19.3	22.2
60-64	8.3	6.7	7.6	27.3	20.2	24.3
65-69	7.5	4.1	5.9	17.0	12.2	14.7
Total	13.7	11.5	12.6	34.3	24.0	29.2

* Refers to usual working time exceeding 40 hours per week
Source: Labour Force Survey '95

Table 17. SMOKING AND ALCOHOL CONSUMPTION, Estonia 1990-1994

	1990	1992	1994
Weekly users of strong alcohol, per cent			
Males	23	20	32
Females	4	7	11
Total	12	13	20
Daily smokers, per cent			
Males	46	49	52
Females	15	20	23
Total	31	35	38

Source: Lipand et al., 1994

Table 18. AIR AND WATER POLLUTION, Estonia 1989-1995

	1989	1990	1991	1992	1993	1994	1995
Air pollution, thds tons							
Solid particles	260.8	268.5	277.6	240.8	189.0	161.5	113.1
Gaseous wastes	315.2	340.8	328.6	238.5	190.8	192.5	153.7
Sulphur dioxide	210.5	238.9	232.7	179.2	145.0	141.1	110.3
Carbon oxide	64.7	59.9	56.8	32.5	27.8	31.8	27.2
Nitrogen oxides	23.1	22.6	20.9	14.8	12	14.6	14.8
Water discharge, mlns cubib meters							
Clean water	2727	2717	2534	2239	1667	1582	1452
Sufficiently purified	271	302	290	269	261	330	352
Insufficiently purified	192	196	214	159	109	29	26
Not purified	54	39	30	21	23	19	18

Source: Estonian Statistical Office, 1996

Table 19. REGRESSION MODEL COEFFICIENTS, Estonia 1989-1995

Independent variable	0-14	15-29	30-49	50-69	70+	Total
Males						
Crude divorce rate	3.85	19.24	-4.00	-7.52	10.35	8.52
Per capita bospital beds	-0.85	-0.39	-1.07	-0.26	0.00	-0.14
Per capita medical doctors	-1.12	1.19	1.49	0.07	0.31	0.08
Percentage of housing allowance recipents	-0.97	0.95	1.83	1.31	0.37	0.59
Unemployment rate	4.53	10.82	2.90	0.68	1.88	3.01
Percentage of foreign-borns	-0.09	-0.12	0.45	0.58	-0.37	0.11
Females						
Crude divorce rate	-35.5	-4.63	-52.08	7.14	-0.48	-10.31
Per capita bospital beds	-4.47	-0.97	-5.52	-0.72	0.06	-1.85
Per capita medical doctors	-2.48	-0.19	-2.43	-0.53	0.29	-0.56
Percentage of housing allowance recipents	2.47	-0.16	2.90	1.75	0.41	1.69
Unemployment rate	-11.62	-2.83	-15.78	-3.21	-0.91	-7.17
Percentage of foreign-borns	1.58	1.97	3.84	0.44	-0.14	1.29