Chapter 12
Mortality Trends by Age Group and Detailed Causes of Death

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Reconstructing cause-of-death series at the most detailed level of the Soviet Classification will enable us to make a more in-depth analysis of the diseases involved in trends across the major groups of causes that we have been studying.

Annex XII (on the Website http://www.demogr.mpg.de/books/drm/009 or http://extras.springer.com/) gives the rates by 5-year age groups (after redistributing deaths from ill-defined causes) for each of the 175 items in the 1981 Soviet Classification[1] (the list of these items, with their equivalents in the 9th Revision of the International Classification of Diseases, is to be found in Annex III-3). Each section of this chapter will examine the detailed causes that are the most significant in one age group. For convenience in presentation, we shall limit ourselves to five large groups, chosen according to specific features that we have previously observed, either of total mortality or of mortality from the major groups of causes. As a result, we shall distinguish mortality among newborns (under 1 year old) from that of children (aged 1–14), young adults (15–39), the middle-aged (40–64) and the old (65 and over). For each large age group, we shall start by giving an overview of mortality trends, using the same major groups of causes as in previous chapters, and then go into more detail about each one. The detailed data given will vary from one age group to another, according to the disease pattern in the given age group using groups of causes specific to the age that will be explained as we go along.

[1] As amended in 1988 for deaths from injury and poisoning.

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12.1 Causes of Death at Under 1 Year Old

When we look at the major groups of causes used in the previous chapters, infant mortality[2] appears to be dominated by "Other diseases" (Fig. 12.1), which is obviously not very illuminating. Even so, at this level, it is also important to point out the major role played by diseases of the respiratory system at the beginning of the period and their significant reduction since 1975. Third place is occupied by infectious diseases: we see here that they were the main cause of the fresh rise in infant mortality in the early 1970s, which alarmed Western writers at the time (Feshbach 1982) and drove the Soviets to cease publishing any mortality statistics from 1974 onwards.

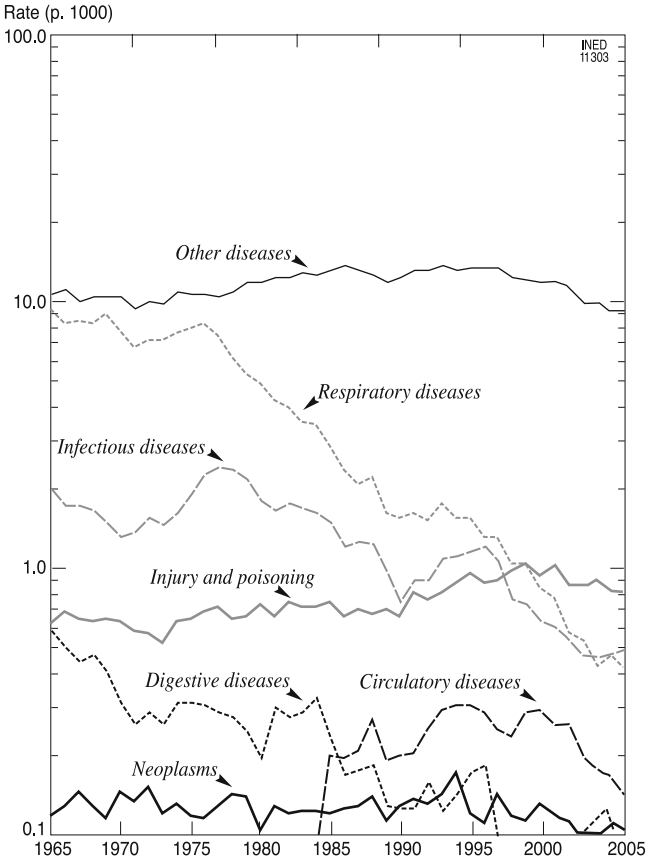

Fig. 12.1 1965–2006 trends in infant mortality rates by major groups of causes

[2]For simplicity's sake, here we shall use the term 'infant mortality' to refer to mortality rates at under 1 year of age, calculated using the ratio of deaths at under 1 year of age to the population aged under 1, not to births (as in the conventional infant mortality rate).

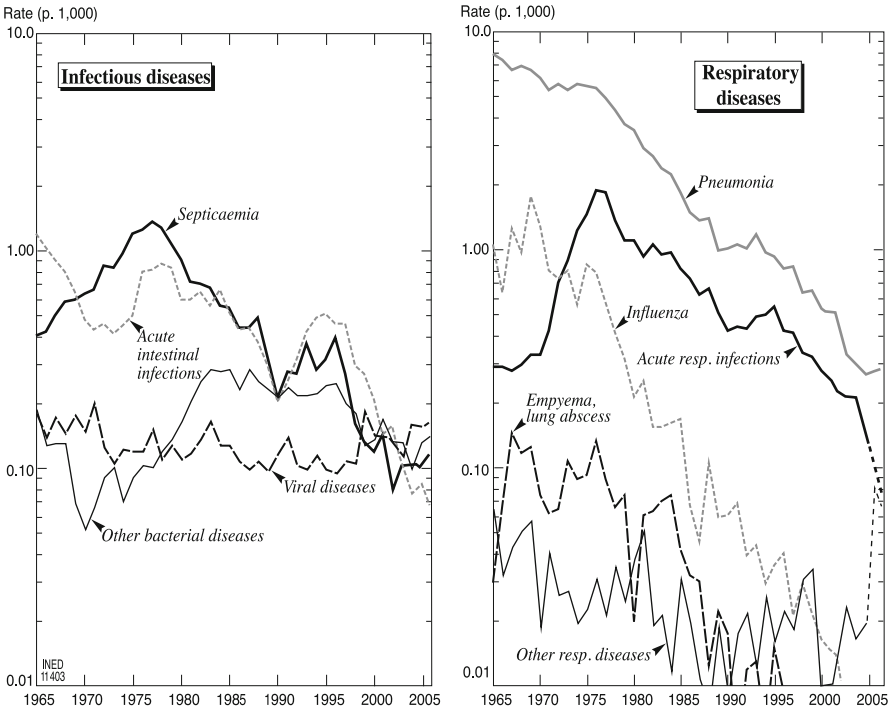

Fig. 12.2 1965–2006 trends in infant mortality rates for the main infectious and respiratory diseases

However, we can see that, since that date, mortality from infections has diminished at almost the same rate as mortality from diseases of the respiratory system. On the other hand, it rose again fairly strongly with the economic and social crisis in the early 1990s, although it has fallen markedly again since 1997. The crisis also seems to have initiated a significant rise in mortality from accidents at this very young age, and this continued into the early 2000s, though it has declined since then. The other major groups of causes have played only a secondary role. So here it seems helpful to give more precise details not only of the "Other diseases" group but also of infectious diseases, diseases of the respiratory system and accidents (Table 12.1 shown at the end of the Section 12.1).

12.1.1 Infectious and Respiratory Diseases

Among infectious diseases of early infancy, septicaemia and acute intestinal infections have by far the greatest impact on mortality (Fig. 12.2). We should note at the outset that the curve tracing trends in acute intestinal infections is probably somewhat suspect at the transition from 1973 to 1974. It will be remembered (from Chap. 4)

that 1974 was marked by a change in practice that considerably improved recording of neonatal mortality, and that this led us to correct the infant mortality rates observed in previous years. In terms of causes of death, we accounted for this correction under "diseases of early infancy". Here we can see that we would probably be able to refine this by attributing part of it to acute intestinal infectious diseases. With that reservation, it remains the case that the rise in mortality from infections observed in the first half of the 1970s appears to have resulted from the fairly chance conjunction between a halt in the fall in mortality from acute intestinal infections and a continuation of the rise already observed earlier for septicaemia. Conversely, the new upsurge observed in the early 1990s clearly resulted from an abrupt reversal for these two main items in the infectious diseases group, both sensitive to the economic and social crisis. Once the effect of the crisis had been overcome in the late 1990s, these two conditions took a very sharp downward turn again. So by the end of the period, they had reached the same level as "other bacterial diseases" and viral diseases. This convergent trend has applied to bacterial diseases since 1990; it has become the case for viral diseases only much more recently, since mortality due to these infections has increased sharply in recent years, after stagnating at a lower level for a long time. This increase provides evidence of the emergence of AIDS among young children.

Mortality from diseases of the respiratory system is dominated by pneumonia (Fig. 12.2). So this cause of death, in deep decline over the whole period, sets the general tone for the fall in infant mortality from diseases of the respiratory system. However, two short periods of stagnation (even, in the second instance, a new upsurge) can be noted, corresponding to the two crises already mentioned in relation to infectious diseases: the early 1970s and the early 1990s. A new halt in the decline, observed in 2005–2006, appears as a dotted line on the graph in Fig. 12.2, since it is unlikely that it reflects reality: it much more probably relates to the fact that, on moving from the Soviet Classification to the 10th Revision of the International Classification (ICD-10), which came into effect in 2005, we were able to make only a fairly crude link between cause-of-death series. This meant that statistical discontinuities almost disappeared from the major groups of causes, but did not always do so at the level of detailed items. In this graph and in all subsequent ones, we have generally used dotted lines to show cases where the 2005–2006 data suffer from this type of problem.

Influenza mortality has also been in rapid decline since the late 1960s, but was much less sensitive to the two crises mentioned above: it fluctuated completely independently, with the onset of each epidemic. The case of "other acute respiratory infections"[3] is less clear. Although they have followed almost exactly the same course as pneumonia since the mid-1970s, they had already been marked by an abrupt rise in the early 1970s. Admittedly, one might be tempted to assimilate this partly with the rise in infectious diseases already mentioned; but it seems to us much more likely

[3]The Soviet Classification does not allow a detailed breakdown of this group of diseases, but in countries where details are available, it is clearly dominated by acute bronchitis.

Fig. 12.3 Trends in infant mortality since 1965: main groups included in "Other diseases" in Fig. 12.1

to result from a change in coding practice to the detriment of certain forms of pneumonia, notably bronchopneumonia. In addition, for 2005–2006, it seems fairly obvious that the introduction of ICD-10 led to data being swapped between the items that correspond to these conditions and the items that cover, firstly, "other diseases of the respiratory system" and, secondly, various forms of pneumonia.

12.1.2 Other Diseases

The dominant position occupied by "Other diseases" in Fig. 12.1 justifies further exploring the contents of this disparate group here. In fact, it is mainly made up of two specific subgroups: "congenital anomalies" and "conditions originating in the perinatal period" (Fig. 12.3).

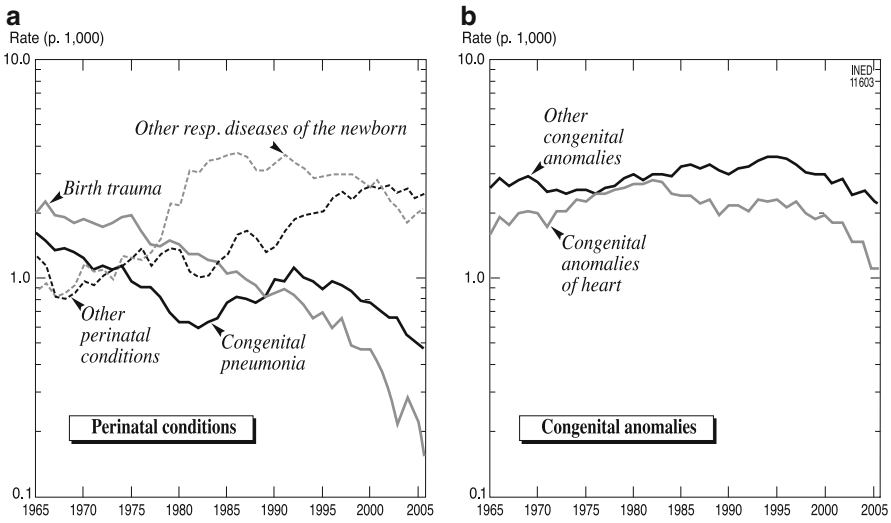

Fig. 12.4 Trends in infant mortality from conditions originating in the perinatal period and from congenital anomalies since 1965

Mortality from perinatal conditions showed a slight but regular increase until the mid-1980s, after which it oscillated for about 15 years and then, just before the turn of the millennium, started to go down slowly. Mortality from congenital anomalies also seems to have increased at the start of the period, but it began to stagnate sooner (from the early 1980s). Like conditions originating in the perinatal period, it has more or less declined since the late 1990s. The third group, diseases of the nervous system, which has diminished slightly over the long term (if we disregard the early 1990s), is responsible for only a tenth the amount of mortality when compared to either of the previous two groups. Mortality from endocrine diseases increased very strongly up to the early 1990s, to the point where it met the rate for diseases of the nervous system, subsequently following a similar course; however, it remains very marginal in itself.

If we go into more detail about conditions originating in the perinatal period (Fig. 12.4a), we see that their overall near-stability is due to the conjunction between a significant fall in mortality from birth trauma (reinforced at the start of the period by a significant fall in mortality from congenital pneumonia) and a fairly pronounced increase in mortality from both "other respiratory conditions of newborn" and "other conditions originating in the perinatal period".

Similarly, the near-stability of mortality from congenital anomalies (Fig. 12.4b) until the mid-1990s reflects the combination of a significant drop in the main group of anomalies, cardiac anomalies, with an increase in all other anomalies.

Fig. 12.5 Trends in infant mortality from injury and poisoning since 1965 (N.B. accidental inhalation cannot be shown separately for 2005–2006, since that year was subject to ICD-10)

12.1.3 Deaths from Injury and Poisoning

The main external cause of death from injury and poisoning among newborns (Fig. 12.5) is accidental inhalation of a foreign body, which increased slightly but steadily, especially in the 1990s. Second place is occupied by suspicious deaths (homicide and 'injury undetermined whether accidentally or purposely inflicted'), which rose fairly steeply from the 1970s to the late 1990s, but have declined since then. In contrast, the group bringing together other deaths from injury and poisoning was very stable over the whole period.

12.2 Causes of Death in Children Aged from 1 to 14

In order to follow cause-of-death trends by large age groups, in this section, as in those that follow, we use standardized rates obtained from weighting the 5-year-age-group rates by the WHO standard European population (1992). While we felt that distinction by sex was completely superfluous for children under 1 year old, for this age group, and the following ones, we shall present the results broken down by sex. As far as children aged 1–14 are concerned, it is true that trends in mortality

Table 12.1 Causes of infant mortality: groups of items used (with corresponding ICD-9 items) and trends in mortality rate between 1965 and 2006

Groups used	1995 Soviet classification	ICD (9th revision)	2005 Ukrainian classification	Rate per 1,000 (both sexes)	
Infectious and parasitic diseases	**1 to 44, 206**	**001 to 139**	**3 to 57**	**1.98**	**0.49**
Acute intestinal infectious diseases	1 to 8	001 to 009	3 to 10	1.17	0.07
Septicaemia	25	038	29	0.40	0.11
Other bacterial diseases	9 to 24, 26, 43	010 to 037, 039 to 041, 137	11 to 28, 30 to 36, 56	0.18	0.14
Viral diseases	27 to 32, 206	042 to 079	37 to 47	0.18	0.16
Other infectious and parasitic diseases	33 to 42, 44	080 to 136, 138, 139	48 to 55, 57	0.05	0.01
Neoplasms	**45 to 67**	**140 to 239**	**59 to 104**	**0.12**	**0.10**
Diseases of the circulatory system	**84 to 102**	**390 to 459**	**133 to 156**	**0.01**	**0.14**
Diseases of the respiratory system	**103 to 114**	**460 to 519**	**158 to 173**	**9.12**	**0.41**
Acute respiratory infections	103	460 to 466	158	0.28	0.07[a]
Influenza	104	487	159	1.03	0.01
Pneumonia	105 to 107	480 to 486	160 to 163	7.71	0.28[a]
Empyema, abscess of lung and mediastinum	112	510, 513	172	0.03	0.00
Other diseases of respiratory system	108 to 111, 113, 114	470 to 478, 490 to 508, 511, 512, 514 to 519	164 to 171, 173	0.06	0.06[a]
Diseases of the digestive system	**115 to 127**	**520 to 579**	**175 to 189**	**0.58**	**0.06**
Other diseases	**68 to 83, 128 to 157**	**240 to 389, 580 to 779**	**106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239**	**10.53**	**9.44**
Endocrine diseases	68 to 72	240 to 289	106 to 108, 110 to 113	0.06	0.23
Diseases of the nervous system and mental disorders	73 to 83	290 to 389	115 to 118	0.67	0.28
Congenital anomalies *including:*	145 to 150	740 to 759	228 to 236	4.07	4.38
Anomalies of heart	*147*	*745, 746*	*230*	*1.54*	*1.09*
Others	*145, 146, 148 to 150*	*740 to 744, 747 to 759*	*228 to 229, 231 to 236*	*2.52*	*2.20*

Conditions originating in the perinatal period *including:*	151 to 157	760 to 779	217 to 226	5.64	5.18
Birth trauma	*151*	*767*	*217*	*1.94*	*0.14*
Congenital pneumonia	*153*	*770.0, 770.1*	*220*	*1.58*	*0.48*
Other respiratory conditions of newborn	*152, 154*	*768, 769, 770.2 to 770.9*	*218, 219, 221*	*0.87*	*2.11*
Other conditions originating in the perinatal period	*155 to 157*	*760 to 766, 771 to 779*	*222 to 226*	*1.26*	*2.45*
Other diseases	128 to 144	580 to 739	120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 239	0.10	0.45[a]
Deaths from injury and poisoning	**160 to 176**	**800 to 999**	**242 to 258**	**0.61**	**0.80**
Accidental inhalation of a foreign body	169	911 to 915		0.32	0.52[b]
Homicide; injury undetermined whether accidentally or purposely inflicted	174, 175	960 to 989	254, 255	0.08	0.15
Other accidents	160 to 168, 170 to 173, 176	800 to 910, 916 to 959, 990 to 999	242 to 253, 256 to 258	0.20	0.21[b]
Total for all causes	**1 to 176, 206**	**001 to 999**	**3 to 57, 59 to 104, 106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 133 to 156, 158 to 173, 175 to 189, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239, 242 to 258**	**22.94**	**11.43**

[a]These rates doubtful, as consistency could not be ensured in the transition from the previous Classification
[b]Given for 2004, since the last revision of the list produced no corresponding category in 2005 and 2006

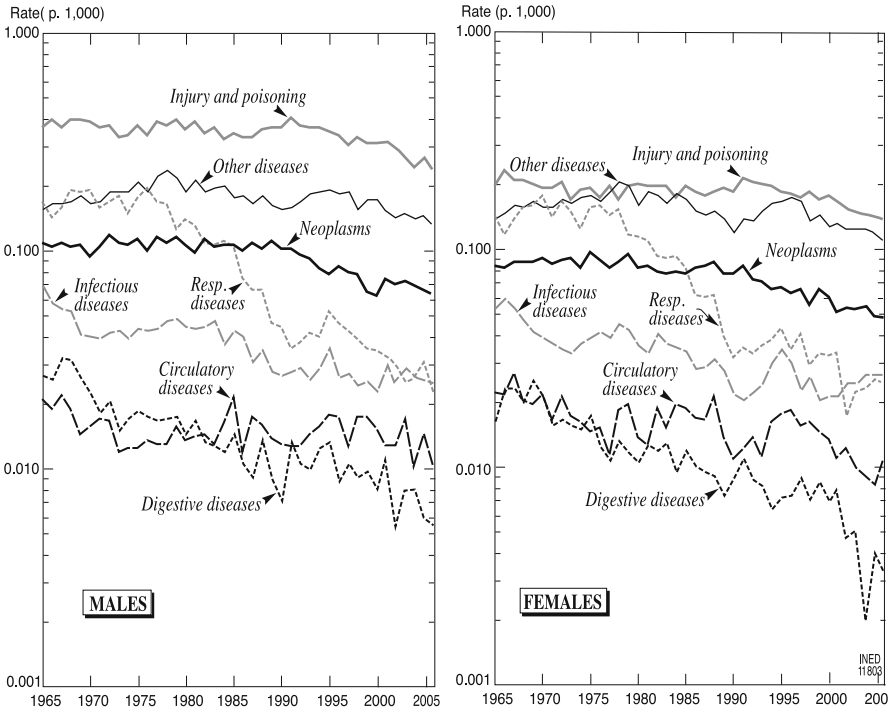

Fig. 12.6 Trends in standardized mortality rates at ages 1–14 by major groups of causes since 1965

by major groups of causes (Fig. 12.6) remain fairly similar for both sexes, but they do include one notable difference: deaths from injury and poisoning are much more frequent among boys than among girls. Among boys, such external causes of death represent by far the leading cause of death at this age. They remained very stable from the 1960s to the 1990s, and it was only in the latter decade that they began to decline somewhat. Therefore they appear to be broadly independent of the major fluctuations in mortality over the last two decades.

Apart from the "Other diseases" group, which again, as for infant mortality, plays an important overall role here, neoplasms and diseases of the respiratory system occupy second and third places respectively in mortality among children aged 1–14. However, the significance of their respective roles has reversed over time: with mortality from neoplasms remaining more or less stable until 1990, the reduction in mortality from diseases of the respiratory system, which was very rapid in the 1970s and 1980s, has brought neoplasms to the fore (despite the fact that cancer mortality has gone into decline over the last decade). However, the sizeable fall in mortality from diseases of the respiratory system took place within a fairly limited period between the late 1970s and the late 1980s. After rising again during the 1992–1994 economic and social crisis, in recent years the trend has taken a fresh downward turn.

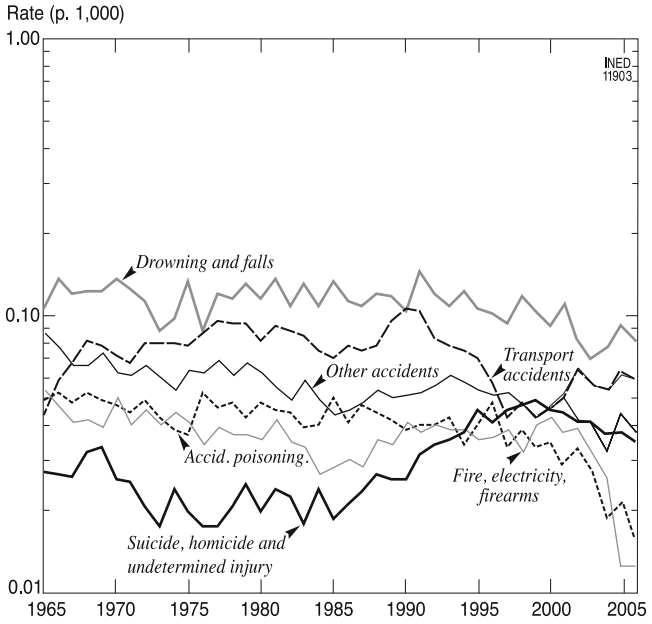

Fig. 12.7 Trends in standardized male mortality rates at ages 1–14: deaths from injury and poisoning since 1965

The other groups of causes have fallen much more, even though nowadays, with the reduction in diseases of the respiratory system, there is a much bigger gap between mortality from infections and mortality from respiratory diseases than there was in the past.

Here, therefore, apart from looking briefly at the "Other diseases" group, we shall go into detail about only the three largest groups: deaths from injury and poisoning, neoplasms, diseases of the respiratory system (Table 12.2 shown at the end of the Section 12.2).

12.2.1 Deaths from Injury and Poisoning

Among children and adolescents, mortality from injury and poisoning results from various external causes that play almost equal parts; these mainly fall into the category of domestic accidents, broadly defined (Fig. 12.7). In this group, falling and, in particular, drowning come top. Next come transport accidents, to which children fall victim above all as pedestrians, then accidental poisoning and, finally, accidents caused by fire, electric current or firearm. Despite small annual fluctuations, these different causes were relatively stable until the late 1990s, and they seem to have been fairly insensitive to the two major fluctuations in the 1980s and 1990s. On the other hand, a marked fall can be seen for some causes (notably accidental poisoning and fire) in the 2000s. Traffic accidents also saw a net reduction in the 1990s, but have risen again since then.

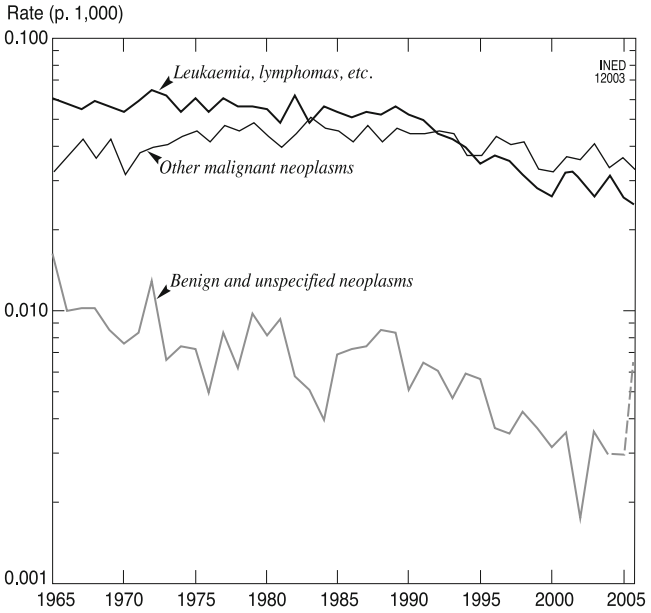

Fig. 12.8 Trends in standardized male mortality rates for neoplasms at ages 1–14 since 1965

Although they remained at the bottom until the mid-1990s, suicide and homicide have not had an insignificant role. These two factors have played almost equal parts in the mortality of children and adolescents. Here we have grouped them together with deaths from injuries where it is undetermined whether they were accidentally or purposely inflicted, which are much less numerous. All have increased significantly since the mid-1980s, but this rise, very regular over more than 15 years, appears to have been completely independent of the immediate circumstances of the 1992–1994 crisis. This type of mortality, which seems to have reached its highest level in the late 1990s, is now in slight decline.

All these causes of death from injury and poisoning are markedly greater for boys than for girls, but the trends they follow do not differ much by sex, which is why we have limited Fig. 12.7 to males. For the same reasons, in the following sections we shall examine only male mortality.

12.2.2 Neoplasms

Cancer deaths of children and adolescents have been to a very great extent dominated by neoplasms of lymphatic and haematopoietic tissue, i.e. leukaemia and lymphomas. For a long time, these even caused higher mortality at these ages than all other malignant neoplasms taken together (Fig. 12.8).

They fell slowly over the whole period, and this fall accelerated remarkably from the late 1980s onwards, perhaps linked to more effective treatments becoming more widely available. In any case, in this age group, trends in mortality from these neoplasms (which are particularly sensitive to incidents of exposure to atomic radiation) seem not to have been marked at all by the Chernobyl disaster. On the contrary, it was just 4 or 5 years after the reactor explosion that mortality from leukaemia and lymphomas started to fall. One might almost imagine that the disaster had an inverse effect: by attracting attention to this type of condition, with resultant Western cooperation, perhaps in the end it has allowed Ukraine to benefit from better treatments in recent years.

As for mortality from benign and unspecified neoplasms, this is very marginal.

12.2.3 Diseases of the Respiratory System

Like infant mortality, mortality among those aged 1–14 from diseases of the respiratory system is dominated by three types of disease: pneumonia, acute respiratory infections and influenza (Fig. 12.9).

Mortality from pneumonia, by far the largest cause in this group, saw a deep decline in the 1970s and 1980s. However, this fall temporarily gave way to a fairly sharp, short rise during the 1992–1994 crisis, before recovering once the crisis had passed. (The abrupt rise in 2005 should not be taken into account, since this was certainly due to a statistical discontinuity resulting from the transition to ICD-10.) Trends in mortality from acute respiratory infections have run fairly much parallel to pneumonia since the late 1970s, with the same sensitivity to the 1992–1994 crisis, which here too interrupted a rapid decline. However, as we have already emphasized in regard to early infancy, mortality from acute respiratory infections was marked by a very dramatic rise in the early 1970s. Once again, in some years this probably resulted from deaths formerly attributed to certain forms of pneumonia (notably bronchopneumonia) being shifted to the item for acute respiratory infections (which is unique in the Soviet Classification) within a few years. If we add together mortality rates from pneumonia and acute respiratory infections (the lighter curve in Fig. 12.9), we obtain a much more realistic outline of the trends: after having stagnated or even slightly increased until the mid-1970s, male mortality from diseases of the respiratory system at ages 1–14 largely went into deep decline until almost 1990.

As for influenza, at these ages it has followed exactly the same pattern as for infant mortality. It remains highly epidemic, but the resulting mortality fell steeply until the early 1990s.

Finally, all these respiratory conditions, although in deep overall decline, played a part in the upsurge in mortality linked to the 1992–1994 economic and social crisis. With this crisis past, they have all recommenced their downward trend in recent years.

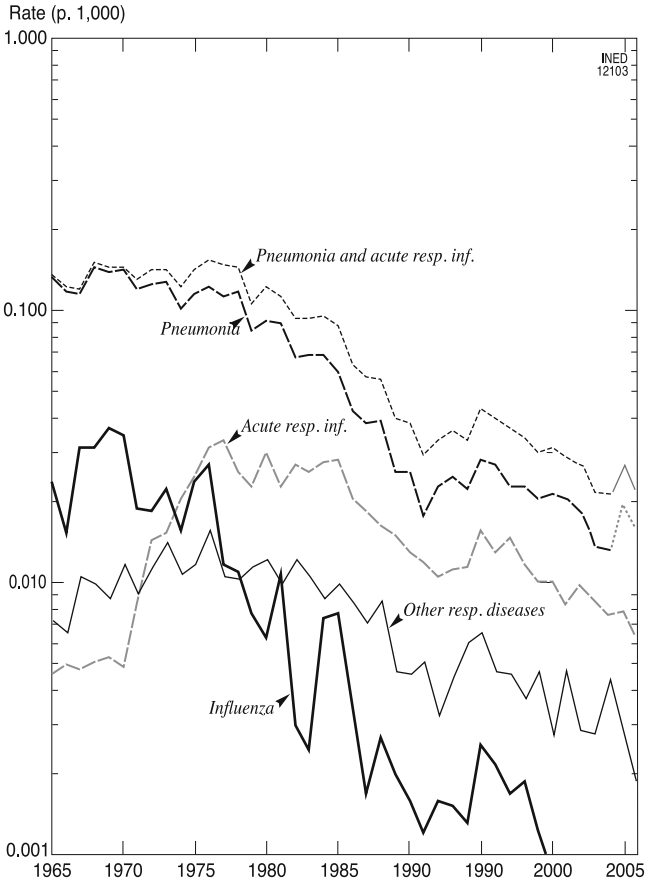

Fig. 12.9 Trends in standardized male mortality rates for diseases of the respiratory system at ages 1–14 since 1965

12.2.4 Other Diseases

As was the case in early infancy, congenital anomalies occupy first (or nearly first) place in mortality from all "other diseases", but this time they are almost equal to diseases of the nervous system, rather than to conditions originating in the perinatal period, which are obviously no longer relevant at this age (Fig. 12.10).

Mortality from endocrine diseases, in third place, comes far behind. We should note a significant increase in mortality from endocrine diseases and, until approximately the late 1990s, in mortality from diseases of the nervous system, while mortality from congenital anomalies stagnated somewhat. None of these diseases seems to have been affected by the major fluctuations in the 1980s and 1990s.

Table 12.2 Causes of death at ages 1–14: groups of items used (with corresponding ICD-9 items) and trends in mortality rate between 1965 and 2006

Groups used	1995 Soviet classification	ICD (9th revision)	2005 Ukrainian classification	Rate per 1,000			
				Male		Female	
				1965	2006	1965	2006
Infectious and parasitic diseases	**1 to 44, 206**	**001 to 139**	**3 to 57**	**0.07**	**0.02**	**0.05**	**0.03**
Neoplasms	**45 to 67**	**140 to 239**	**59 to 104**	**0.11**	**0.06**	**0.08**	**0.05**
Leukaemia and lymphomas	65, 66	200 to 208	99 to 103	0.06	0.02	0.04	0.02
Other malignant neoplasms	45 to 64	140 to 199	59 to 98	0.03	0.03	0.03	0.03
Benign and unspecified neoplasms	67	210 to 239	104	0.02	*0.01	0.01	*0.00
Diseases of the circulatory system	**84 to 102**	**390 to 459**	**133 to 156**	**0.02**	**0.01**	**0.02**	**0.01**
Diseases of the respiratory system	**103 to 114**	**460 to 519**	**158 to 173**	**0.16**	**0.02**	**0.14**	**0.02**
Acute respiratory infections	103	460 to 466	158	0.00	0.01	0.00	0.00
Influenza	104	487	159	0.02	0.00	0.02	0.00
Pneumonia	105 to 107	480 to 486	160 to 163	0.13	*0.01	0.11	*0.02
Other diseases of respiratory system	108 to 114	470 to 478, 490 to 519	164 to 173	0.01	0.00	0.01	0.00
Diseases of the digestive system	**115 to 127**	**520 to 579**	**175 to 189**	**0.03**	**0.01**	**0.02**	**0.00**
Other diseases	**68 to 83, 128 to 157**	**240 to 389, 580**	**106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239**	**0.16**	**0.13**	**0.14**	**0.11**
Endocrine diseases	68 to 72	240 to 289	106 to 108, 110 to 113	0.01	0.01	0.01	0.01
Diseases of the nervous system and mental disorders	73 to 83	290 to 389	115 to 118, 120 to 128, 130, 131	0.07	0.05	0.06	0.04
Congenital anomalies	145 to 150	740 to 759	228 to 236	0.06	0.06	0.05	0.06
Other diseases	128 to 144, 151 to 157	580 to 739, 760 to 779	190 to 195, 197 to 205, 207 to 215, 217 to 226, 239	0.02	*0.00	0.01	*0.00

(continued)

Table 12.2 (continued)

Groups used	1995 Soviet classification	ICD (9th revision)	2005 Ukrainian classification	Rate per 1,000			
				Male		Female	
				1965	2006	1965	2006
Deaths from injury and poisoning	**160 to 176**	**800 to 999**	**242 to 258**	**0.36**	**0.24**	**0.19**	**0.13**
Transport accidents	160 to 162	800 to 848	242 to 248	0.04	0.06	0.02	0.03
Drowning and falls 166, 168	880 to 888, 910	249 to 250	0.10	0.08	0.04	0.03	
Accidental poisoning	163, 164	850 to 869	252	0.05	0.02	0.04	0.02
Accidents caused by fire, electric current or firearm	167, 170, 171	890 to 899, 922, 925	251	0.05	0.01	0.03	0.01
Suicide, homicide, injury undetermined whether accidentally or purposely inflicted	173 to 175	950 to 989	253 to 255	0.03	0.03	0.01	0.02
Other accidents	165, 169, 172, 176	870 to 879, 900 to 909, 911 to 921, 923, 924, 926 to 949, 990 to 999	256 to 258	0.09	0.04	0.04	0.02
Total for all causes	**1 to 176, 206**	**001 to 999**	**3 to 57, 59 to 104, 106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 133 to 156, 158 to 173, 175 to 189, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239, 242 to 258**	**0.90**	**0.49**	**0.64**	**0.43**

For 2006, rates preceded by an asterisk are doubtful, since consistency could not be guaranteed in the transition from the previous Classification

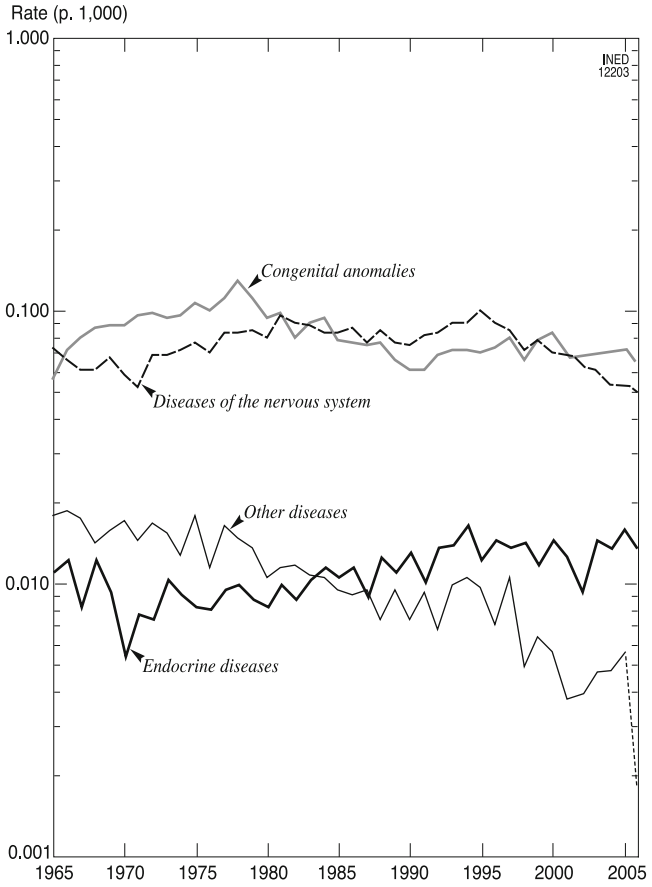

Fig. 12.10 Trends in standardized male mortality rates for other diseases at ages 1–14 since 1965

12.3 Causes of Death in Young Adults Aged from 15 to 39

Mortality in young adults aged 15–39 presents at least three characteristics that are markedly more pronounced than they are in the other age groups: there is a particularly large difference between the sexes; this mortality was highly sensitive to the major fluctuations in the 1980s and 1990s; among males, the pattern of diseases is hugely dominated by deaths from injury and poisoning (Fig. 12.11).

At this age, throughout the whole period studied here, four to five times as many males died from such injuries and poisoning as from diseases of the circulatory system and, when it comes to any other major group of causes of death, the gap is even wider. Among females, the dominance of deaths from injury and poisoning is less spectacular; nevertheless, this group of causes still comes at the top (Table 12.3 shown at the end of the Section 12.3).

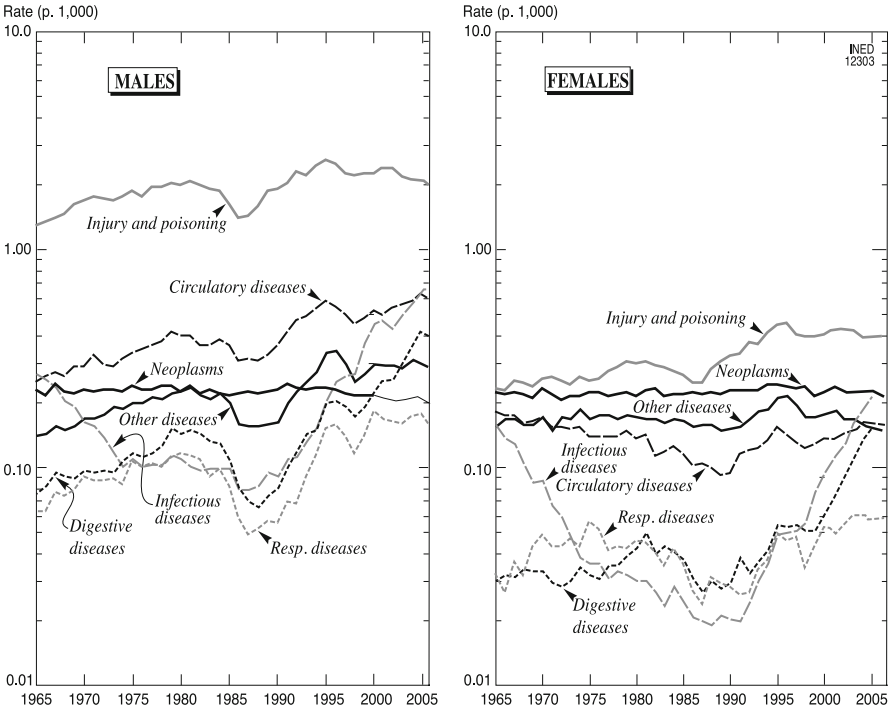

Fig. 12.11 Trends in standardized mortality rates for major groups of causes at ages 15–39 since 1965

Especially for males, but also for females, the major fluctuations in the last two decades have left a very strong mark on trends in mortality from each major group of causes, with the sole exception of neoplasms. The anti-alcohol campaign led to a sharp decline in mortality, not only from injury and poisoning (as we know, the Soviet practice was to include excessive alcohol consumption in this group) and diseases of the digestive system (which include cirrhosis of the liver), but also from diseases of the circulatory system, diseases of the respiratory system and even infectious diseases and all "other diseases". Conversely, in the late 1980s, with the relaxation of the anti-alcohol measures, all these causes took an upward turn again.

All groups of causes except neoplasms reacted just as much to the 1992–1995 economic and social crisis. However, this time it was diseases of the digestive system, diseases of the respiratory system and infectious diseases that reacted most sharply, although there was also a strong rise in diseases of the circulatory system and all other diseases. The rise in deaths from injury and poisoning was a little smaller, particularly among males, but this is explained – as we shall see below – by the fact that, although the crisis increased the other risks of external causes of death, it reduced automobile use (incomes were lower and there were petrol shortages) and thus mortality from road traffic accidents.

For all these causes, once the effects of the crisis had been overcome, mortality began to decline fairly rapidly; but then it very quickly took an upward turn again. As 1999 turned to 2000, this very clear fresh upsurge became particularly marked and, as far as infectious diseases are concerned, it has continued up to the present day – a phenomenon that may be directly or indirectly linked to AIDS penetrating the young adult age group. However, the phenomenon is almost the same for diseases of the digestive system, which a priori are less linked to AIDS.

In contrast to all the other curves in Fig. 12.11, which bear the very strong stamp of these major fluctuations, the absolutely fixed position of neoplasms is spectacular and confirms the very particular nature of this group of causes of death, which is utterly impervious to events in society.

Cancer is also an exception to the final salient feature of mortality among young adults, the extraordinary excess male mortality. Neoplasms are the only group of causes for which near-equality between the sexes can be observed over the whole period. For all other causes, the difference between the sexes is very large, at least in the most recent period. It is at its highest for deaths from injury and poisoning, which led to mortality six times greater among males than among females over almost the whole period. For most of the other groups of causes, excess male mortality has increased since 1965. This increase has been particularly spectacular for infectious diseases, diseases of the circulatory system and "other causes", all of which, in 1965, led to only a small amount of excess male mortality and even to some excess female mortality. Nowadays, for all these groups of causes, male mortality is three to five times higher than female mortality.

Given the respective proportions of these different groups of causes, it seems helpful to go into more detail about deaths from injury and poisoning, diseases of the circulatory system, neoplasms and the "other diseases" group. We shall also analyse a little more closely the impact of AIDS on the new rise in infectious and respiratory diseases.

12.3.1 Deaths from Injury and Poisoning

The major fluctuations in the 1980s and 1990s did not affect all external causes of death in the same way. Figure 12.12 brings together the main types of deaths from injury and poisoning according to their trend patterns.

Among males, the 1985 anti-alcohol campaign led to a marked decline in suicide, accidental poisoning, homicide and deaths resulting from 'injury undetermined whether accidentally or purposely inflicted', all causes which, we know, are directly or indirectly linked to alcohol consumption (first box in Fig. 12.12). Although it is smaller, the reduction is equally clear for transport accidents, drowning and falls. In other words, the anti-alcohol campaign led to a decline in all the major causes of death from injury and poisoning. Conversely, the relaxation of those measures

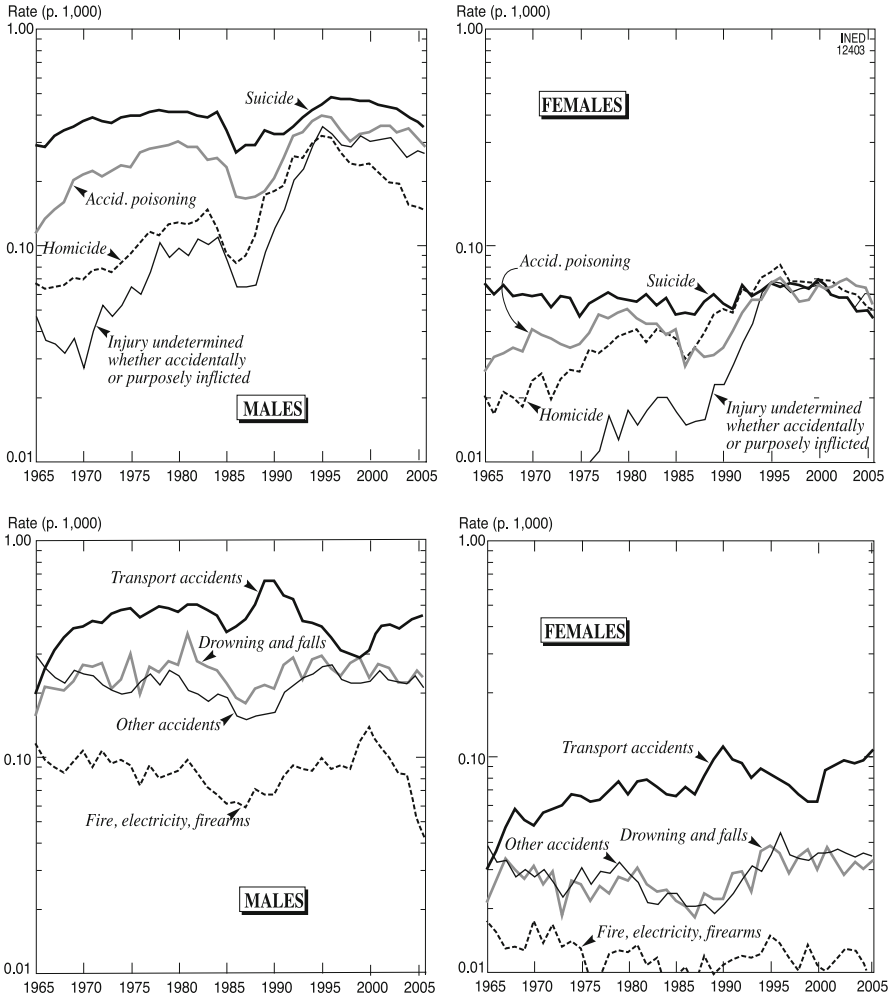

Fig. 12.12 Trends in standardized mortality rates at ages 15–39 since 1965: deaths from injury and poisoning

was followed by a fresh upsurge in the same causes, with more slight differences, however. This fresh rise was, in particular, more rapid for homicide and transport accidents than for the other causes; but, above all, it is notable that by 1990–1991 the mortality rate for transport accidents was clearly higher than it had been before the anti-alcohol campaign. It is reasonable to think, therefore, that this upsurge in mortality from injury and poisoning was not only due to the resumption in alcohol consumption, but probably also related to the 1989–1990 political regime change. After police controls slackened, entirely new opportunities to exercise individual freedoms served to exacerbate some risks, such as those associated with crime and

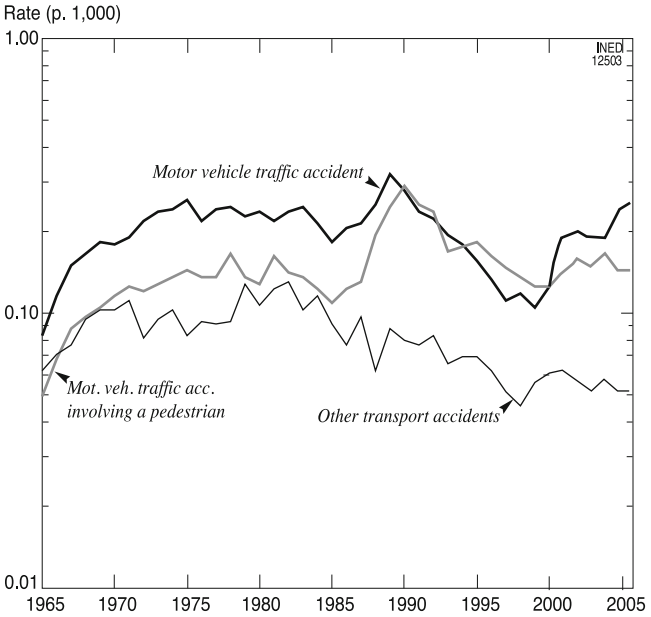

Fig. 12.13 Trends in standardized male mortality rates for transport accidents at ages 15–39 since 1965

with road traffic. It should also not be forgotten that the number of cars on the roads increased greatly during the late 1980s.

On the other hand, although the 1992–1994 economic and social crisis brought external causes of death such as accidental poisoning, homicide, suicide or 'injury undetermined whether accidentally or purposely inflicted' to a peak, it had the reverse effect on mortality from transport accidents, since road traffic was reduced (notably by fuel shortages). Not only is mortality from transport accidents dominated by road traffic accidents, but in fact it is solely the latter that have been sensitive to recent fluctuations, with mortality reaching a peak in 1989–1990 in particular, following a period of rapid growth in automobile purchases and road traffic (Fig. 12.13). Then, during the economic and social crisis and the fuel shortages, road deaths declined strongly, both for vehicle occupants and for pedestrians. In contrast, as Fig. 12.13 shows, trends in mortality from other transport accidents are independent of political and social events: they have been in regular decline since the early 1980s.

The effect of the anti-alcohol campaign is much less visible for females than for males. On the other hand, the rise in road deaths in the late 1980s and the upsurge in different forms of mortality from injury and poisoning during the economic and social crisis were just as marked and although, in total, these forms of mortality increased for females more than for males, that is because the reduction in road deaths was of relatively little benefit to them.

12.3.2 Diseases of the Circulatory System

As with deaths from injury and poisoning, the different components of mortality from diseases of the circulatory system have been represented in Fig. 12.14 according to how sensitive their trends were to the fluctuations in the 1980s and 1990s. So we see that rheumatic heart diseases, acute myocardial infarction and, perhaps to a lesser extent, cerebrovascular disease and "other diseases of the circulatory system" (Boxes 3 and 4 in Fig. 12.14) very largely escaped these fluctuations.

Mortality from rheumatic heart diseases saw a dizzying fall over the whole period, as much for males as for females. It is true that this group of pathologies is largely infectious in origin, which explains its decline over the course of the 1970s, but here we can also see that this trend did not go into reverse during the 1990s crisis, probably because the processes involved act over the long term and because the mortality observed in this age group during the 1980s related to infections contracted during childhood.

The case of acute myocardial infarction is more difficult to explain. It is quite surprising that, in a general context of rising mortality from diseases of the circulatory system and in an era when one would expect progress in identifying ischaemic diseases, mortality from myocardial infarction increased only very slightly over the whole period. But it is even more surprising that here this type of mortality seems to have been totally insensitive to abrupt changes in alcohol consumption; yet, according to the literature, binge-drinking spirits (like vodka in Ukraine) can cause acute cardiac events (Britton et al. 1998). In contrast, the impact of the anti-alcohol campaign on cardiosclerosis, "other forms of ischaemic heart disease" and "other forms of heart disease" is very visible: all these pathologies have risen very significantly (Boxes 1 and 2, Fig. 12.14). They were also very much affected by the 1992–1994 economic and social crisis, with observed mortality culminating around 1995 in higher rates than their general trends would have led us to anticipate. Finally, they increased strongly again as 1999 gave way to 2000 (whereas circulatory disease in general fell more and more rapidly); and this rise has even continued up to the present day for "other forms of heart disease". For all these reasons, it seems to us that "acute myocardial infarction" here covers only part of the mortality linked to that condition, since there is a probably a preference for classifying most instances (in particular, cardiac events aggravated by alcohol) under one of the three other major items relating to heart disease.

Male mortality from cerebrovascular disease or from "other diseases of the circulatory system" reached a low point in 1986, but here the link with the anti-alcohol campaign is less clear, since this low level resulted from a fall that had been under way since the very early 1980s. This mortality has risen again since the early 1990s, but here too the relationship with the violent impact of the 1992–1994 crisis is less obvious.

The trends observed in female mortality are less pronounced, except for rheumatic heart diseases, where the long run decline is even stronger than it is for males.

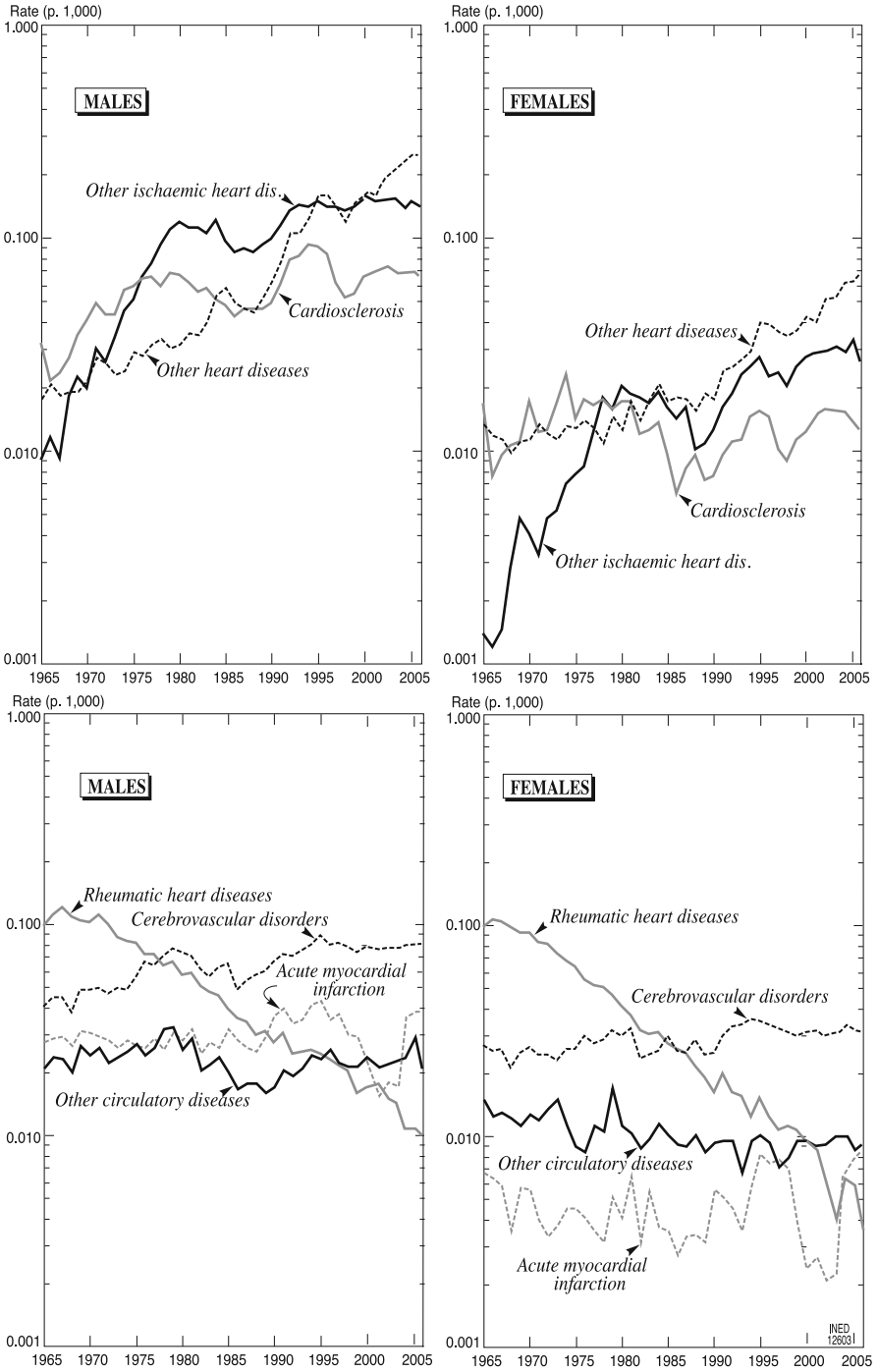

Fig. 12.14 Trends in standardized mortality rates for diseases of the circulatory system at ages 15–39 since 1965

12.3.3 Neoplasms

The complete stagnation of mortality from neoplasms at ages 15–39, emphasized at the beginning of this section, in fact resulted from somewhat contrasting movements relating to the different forms of neoplasms. In Fig. 12.15, we show the main neoplasms according to increases, falls or stagnation in the mortality that they have caused since 1965. In no case, however, can any link be observed with the major overall fluctuations in the 1980s and 1990s, and this confirms that trends in mortality from neoplasms are independent of immediate political and social circumstances.

On the male side, mortality increased for "neoplasms of the bones, cartilage and skin", for "neoplasms of the nose, mouth, pharynx and oesophagus" and for "other malignant neoplasms". On the female side, neoplasms of the breast and of the uterus must be added to these three groups. When compared to trends observed in other countries, these are fairly classic, with the exception of the trend in mortality from cancer of the uterus. This type of mortality is declining in most industrial countries, thanks to the lower prevalence of genital infections and to early screening for neoplasms of the cervix. In fact, it also declined in Ukraine up to the late 1970s, but has increased very regularly since then, which leads us to presume that gynaecological monitoring has become somewhat more lax. The fall in mortality from "neoplasms of the nose, mouth, pharynx and oesophagus" observed since the early 1990s may also seem astonishing, since we know that this mortality is sensitive to co-occurring alcohol and tobacco use, and there is nothing to indicate that these are declining in Ukraine. Finally, we should stress that the late 1990s saw an onset of decline in mortality from breast cancer. Although this trend cannot be attributed to any change in coding practices, it is completely original, since at that early point in time there was scarcely any other country where this mortality was known to be declining. In fact, this fall has not continued since then, which makes it all the more suspicious.

In contrast to these growing areas of neoplasms, there are two groups that are declining for both males and females: malignant neoplasms of the stomach, and benign and unspecified neoplasms. Here too, we find the classic trends that can be observed in most industrial countries. However, the reduction in mortality from neoplasms of the stomach, which is the main source of improvements in cancer mortality in this period, is less marked in Ukraine than in Western countries, as we shall see when we look at the next age group.

Among the cancers responsible for a constant level of mortality throughout the whole period, we find neoplasms of lymphatic and haematopoietic tissue; we should note that, even at this age, they still constitute the main cause of cancer mortality in men, while for women they are equal with breast cancer. Contrary to what we saw in the younger age groups for these same neoplasms, this stagnation in mortality was accompanied, for males, by a small but visible rise from 1988 to 1989, followed by a near-return to the earlier level in 1993. Since this is the group that consists of young people of working age, it probably bears the stamp of excess mortality among men who took part in the Chernobyl reactor recovery and clean-up

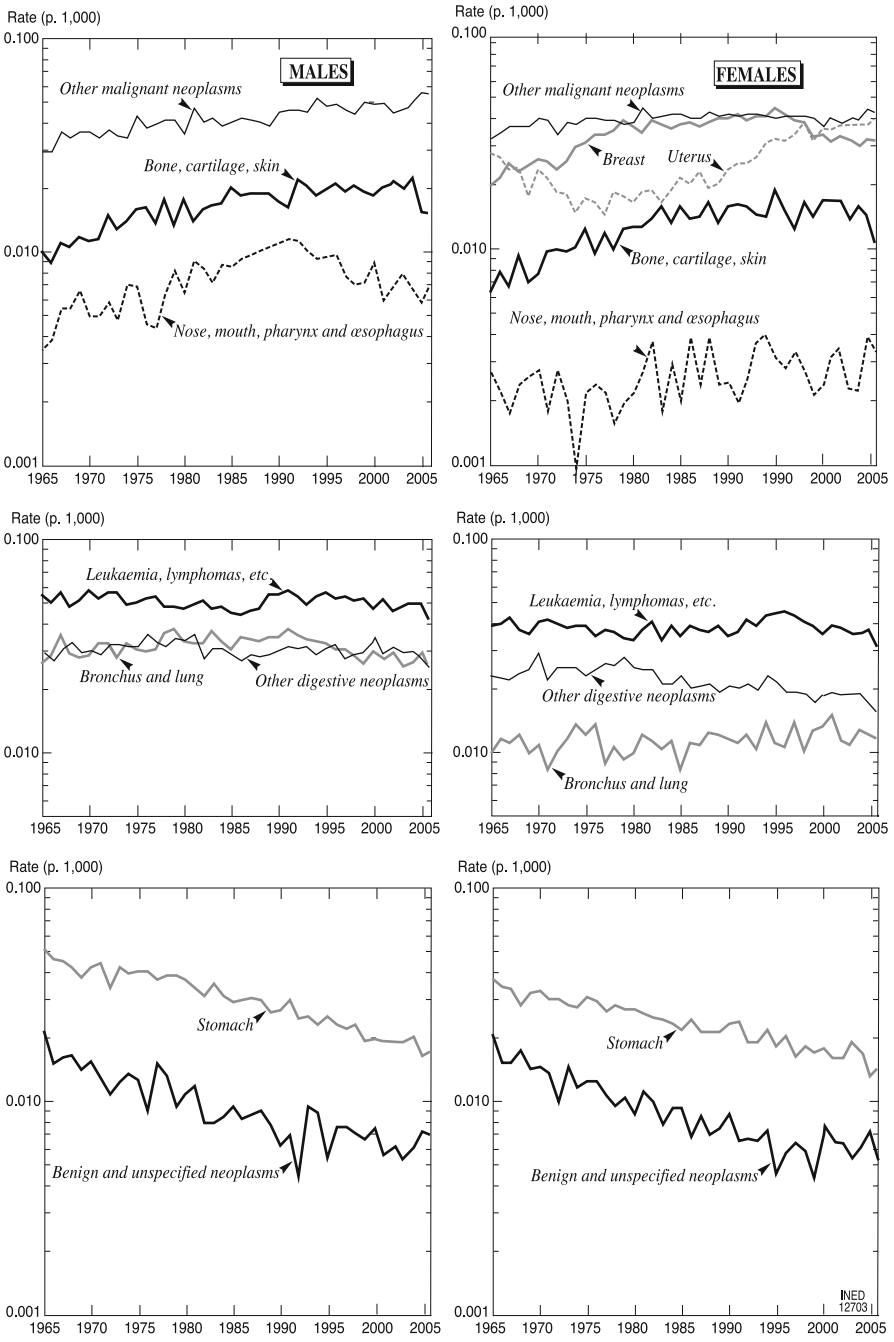

Fig. 12.15 Trends in standardized mortality rates for neoplasms at ages 15–39 since 1965

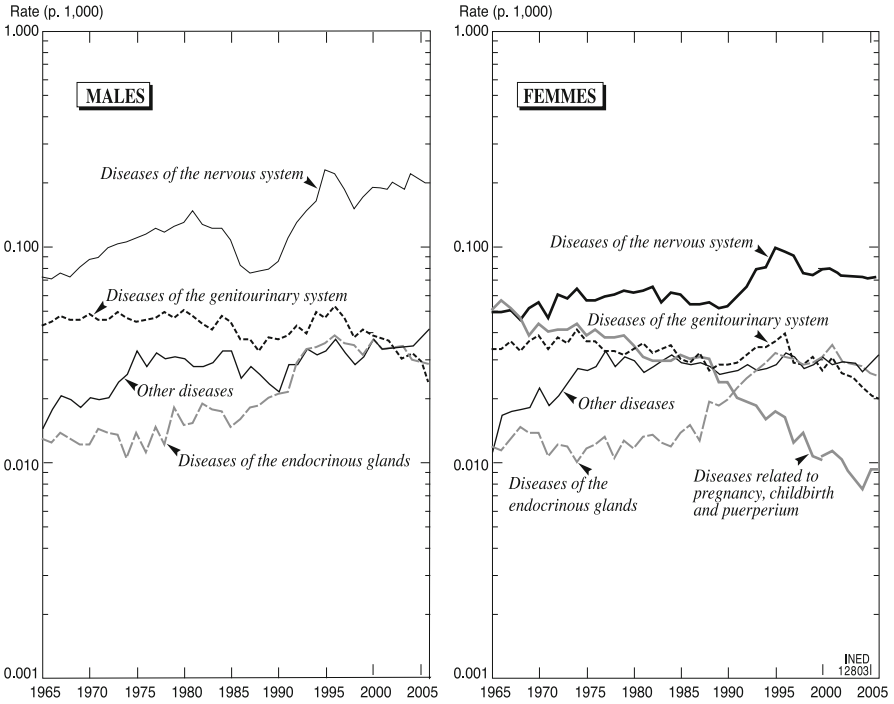

Fig. 12.16 Trends in standardized mortality rates for other diseases at ages 15–39 since 1965

work[4] (Lakiza-Sachuk et al. 1994), assuming an average of 3–5 years' survival for the most seriously affected people. However, we were astonished to see that among women, who played a smaller part in the work than men, the rise in these cancers was greater and came later, but was also more clearly followed by a decline. Are we to conclude from this that women were more sensitive than men, yet their survival time was longer?

Mortality from other malignant neoplasms of the digestive organs (mainly liver and intestines) and mortality from neoplasms of the respiratory organs have both been equally stagnant over the long term. This is because, at this age, cancer of the bronchus and lung is not yet strongly dependent on trends in tobacco consumption.

12.3.4 Other Diseases

Among conditions in the "other diseases" group, first place for both males and females is occupied by diseases of the nervous system (Fig. 12.16). We can also see here that,

[4]Out of a total of 600,000 people (known as "liquidators"), about 350,000 Ukrainians took part in the clean-up work at the damaged power station, of whom almost half were conscripted soldiers.

Fig. 12.17 Trends in standardized mortality rates for certain diseases of the nervous system at ages 15–39 since 1965

in males, mortality from this group of causes was very sensitive to the fluctuations in the 1980s and 1990s. Not only did it plummet down in 1986–1987 with the anti-alcohol campaign, but it soared again with the 1992–1994 economic and social crisis.

Among diseases of the nervous system, three conditions have contributed to this strong sensitivity to recent fluctuations, though in different ways (Fig. 12.17). Firstly, as might be expected, mortality from alcohol dependence syndrome and alcohol-induced psychosis responded to the anti-alcohol campaign with a spectacular fall, rapidly followed by an equally spectacular rise when the restrictive measures were relaxed. However, this rise does not seem to have been unduly exacerbated by the 1992–1994 economic and social crisis. On the other hand, mortality from "other mental disorders", whose earlier increase had hardly been disturbed by the anti-alcohol campaign, rocketed under the effect of the economic and social crisis. In a much more limited way, mortality from epilepsy (relatively stable over the long term) noticeably diminished with the anti-alcohol campaign; but its subsequent, somewhat delayed rise seems to have been linked more to the crisis than to the relaxation of that campaign. In contrast, all the other diseases of the nervous system that have some importance in terms of mortality remained insensitive to political and social events.

As far as other groups of conditions belonging to the "other diseases" category are concerned, we should just note here the relative stability of diseases of the genito-urinary system, the rise in endocrine diseases in the late 1990s and, among females, the reduction in complications of pregnancy and childbirth. Whereas in 1965 the latter were equal with diseases of the nervous system, nowadays they are responsible for only a tenth as much mortality. This elimination of maternal mortality is certainly linked to the general decline in the danger of infections, but the fall in the birth rate must also have played a role, especially as it has accelerated recently.

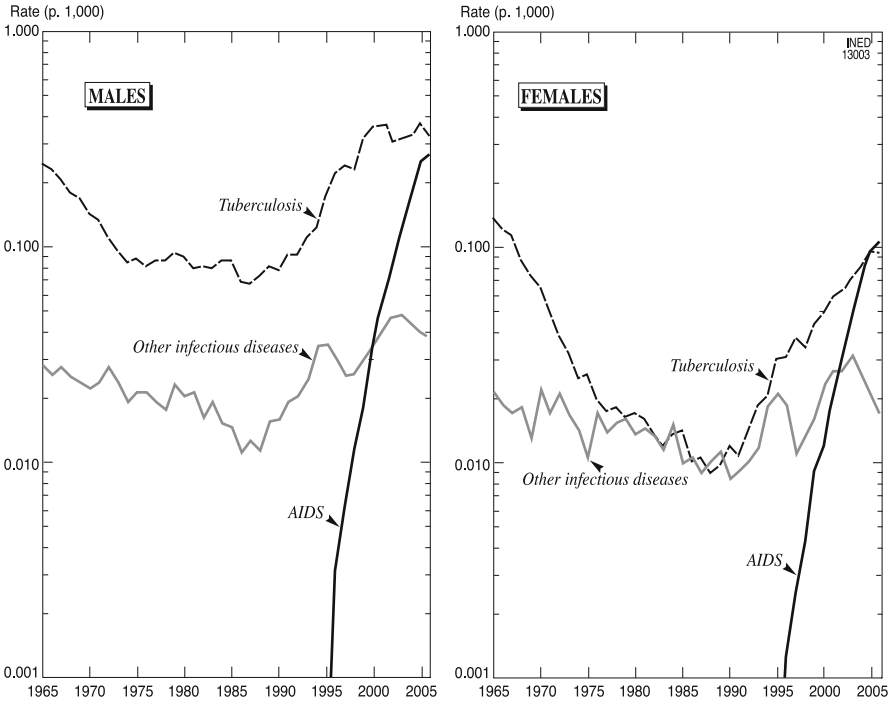

Fig. 12.18 Trends in standardized mortality rates for tuberculosis, AIDS and other infectious diseases at ages 15–39 since 1965

12.3.5 Infectious Diseases and AIDS

In Ukraine, mortality from infections – at least as regards items that the Soviet Classification (like the ICD) placed in this category – was very largely dominated by tuberculosis throughout almost the whole period we studied. In 1965, among Ukrainian males in the 15–39 age group, this disease alone caused over eight times as much mortality as might be attributed to all other infectious diseases together (Fig. 12.18; Table 12.3); and in 2000, despite the sudden emergence of AIDS, this ratio was still almost 4–1. But since then, in just a few years, AIDS mortality has almost reached the same level as mortality from tuberculosis. This is all the more overwhelming because mortality from tuberculosis, in very strong decline until about 1975, had stopped falling in the 1980s before suddenly taking off again on an upward trajectory that was actually an effect of AIDS.

Among women, the initial predominance of tuberculosis was less; then the disease declined more and for longer, to the point where mortality due to "other infectious diseases" played an equal role with it for 20 years (1975–1995). But then mortality from AIDS burst onto the scene and significantly overtook mortality from "other

Table 12.3 Causes of death at ages 15–39: groups of items used (with corresponding ICD-9 items) and trends in mortality rate between 1965 and 2006

Groups used	1995 Soviet classification	ICD (9th revision)	2005 Ukrainian classification	Rate per 1,000			
				Male		Female	
				1965	2006	1965	2006
Infectious and parasitic diseases	**1 to 44, 206**	**001 to 139**	**3 to 57**	**0.27**	**0.63**	**0.16**	**0.21**
Tuberculosis	9 to 13, 43	010 to 018, 137	11 to 17, 56	0.24	0.33	0.14	0.09
AIDS	206	42 to 44	46	0.00	0.26	0.00	0.10
Other infectious diseases	1 to 8, 14 to 42, 44	001 to 009, 020 to 41, 45 to 138, 139	3 to 10, 18 to 45, 47 to 55, 57	0.03	0.04	0.02	0.02
Neoplasms	**45 to 67**	**140 to 239**	**59 to 104**	**0.22**	**0.19**	**0.22**	**0.21**
Malignant neoplasms of the nose, mouth, pharynx and oesophagus	45, 46	140 to 150	59 to 62	0.00	0.01	0.00	0.00
Malignant neoplasm of stomach	47	151	63	0.05	0.02	0.04	0.01
Other malignant neoplasms of digestive organs	48 to 51	152 to 159	64 to 72	0.03	0.02	0.02	0.01
Malignant neoplasms of respiratory organs	52 to 54	160 to 165	73 to 75	0.03	0.02	0.01	0.01
Malignant neoplasm of bones, cartilage and skin	55, 56	170 to 173	76 to 78	0.01	*0.01	0.01	*0.01
Malignant neoplasm of breast	57	174, 175	80	0.00	0.00	0.02	0.03
Malignant neoplasm of uterus	58, 59	179 to 182	81 to 83			0.03	0.04
Leukaemia and lymphomas	65, 66	200 to 208	99 to 103	0.05	0.04	0.04	0.03
Other malignant neoplasms	60 to 64	183 to 199	79 to 84, 98	0.03	0.06	0.03	0.05
Benign and unspecified neoplasms	67	210 to 239	104	0.02	0.01	0.02	0.01
Diseases of the circulatory system	**84 to 102**	**390 to 459**	**133 to 156**	**0.24**	**0.58**	**0.18**	**0.16**
Rheumatic heart diseases	84, 85	390 to 398	133, 134	0.10	0.01	0.10	0.00
Acute myocardial infarction	90, 91	410	139, 140	0.03	0.04	0.01	0.01
Atherosclerotic cardiosclerosis	92, 93	414.0	142	0.03	0.06	0.02	0.01
Other forms of ischaemic heart disease	94, 95	411 to 413, 414.1 to 414.9	141, 143	0.01	0.14	0.00	0.03

(continued)

Table 12.3 (continued)

Groups used	1995 Soviet classification	ICD (9th revision)	2005 Ukrainian classification	Rate per 1,000			
				Male		Female	
				1965	2006	1965	2006
Other forms of heart disease	96, 97	415 to 429	135 to 138, 144 to 146	0.02	0.23	0.01	0.07
Cerebrovascular disease	98, 99	430 to 438	147 to 151	0.04	0.08	0.03	0.03
Other diseases of circulatory system	86 to 89, 100 to 102	401 to 405, 440 to 459	152 to 156	0.02	0.02	0.01	0.01
Diseases of the respiratory system	**103 to 114**	**460 to 519**	**158 to 173**	**0.06**	**0.16**	**0.03**	**0.06**
Diseases of the digestive system	**115 to 127**	**520 to 579**	**175 to 189**	**0.08**	**0.39**	**0.03**	**0.15**
Other diseases	**68 to 83, 128 to 157**	**240 to 389, 580 to 779**	**106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239**	**0.14**	**0.28**	**0.15**	**0.15**
Endocrine diseases	68 to 72	240 to 289	106 to 108, 110 to 113	0.01	0.03	0.01	0.02
Diseases of the nervous system and mental disorders *including:*	73 to 83	290 to 389	115 to 131	0.07	0.20	0.05	0.07
Alcohol dependence syndrome and alcohol-induced psychosis	*73, 75*	*291, 303*	*115*	*0.01*	*0.04*	*0.00*	*0.01*
Other mental disorders	*74, 76, 77*	*290, 292 to 302, 304 to 319*	*116 to 118*	*0.01*	*0.02*	*0.01*	*0.01*
Epilepsy	*81*	*345*	*125*	*0.03*	*0.03*	*0.02*	*0.01*
Others	*78 to 80, 82, 83*	*320 to 344,346 to 389*	*120 to 124, 126 to 131*	*0.03*	*0.11*	*0.02*	*0.04*
Diseases of the genitourinary system	128 to 134	580 to 629	197 to 205	0.04	0.02	0.03	0.02
Complications of pregnancy, childbirth and the puerperium	135 to 141	630 to 676	207 to 215	0.00	0.00	0.05	0.01
Other diseases	142 to 157	680 to 779	190, 192 to 195, 217 to 226, 228 to 236, 239	0.01	0.04	0.01	0.03
Deaths from injury and poisoning	**160 to 176**	**800 to 999**	**242 to 258**	**1.26**	**1.96**	**0.22**	**0.38**
Transport accidents *including:*	160 to 162	800 to 848	242 to 248	0.19	0.45	0.03	0.11

Motor vehicle traffic accidents	*160*	*810 to 813, 815 to 825*	*243 to 245*	*0.08*	*0.25*	*0.01*	*0.06*
Motor vehicle traffic accident involving collision with pedestrian	*161*	*814*	*242*	*0.05*	*0.14*	*0.01*	*0.04*
Other transport accidents	*162*	*800 to 807, 826 to 848*	*246 to 248*	*0.06*	*0.05*	*0.01*	*0.01*
Drowning and falls	166, 168	880 to 888, 910	249, 250	0.15	0.22	0.02	0.03
Accidental poisoning	163, 164	850 to 869	252	0.11	0.28	0.03	0.05
Accidents caused by fire, electric current or firearm	167, 170, 171	890 to 899, 922, 925	251	0.11	0.04	0.02	0.01
Suicide	173	950 to 959	253	0.29	0.36	0.07	0.05
Homicide	174	960 to 978	254	0.07	0.14	0.02	0.05
Death from injury undetermined whether accidentally or purposely inflicted	175	980 to 989	255	0.05	0.27	0.01	0.06
Other accidents	165, 169, 172, 176	870 to 879, 900 to 909, 911 to 921, 923, 924, 926 to 949, 990 to 999	256 to 258	0.29	0.20	0.04	0.03
Total for all causes	**1 to 176, 206**	**001 to 999**	**3 to 57, 59 to 104, 106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 133 to 156, 158 to 173, 175 to 189, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239, 242 to 258**	**2.27**	**4.19**	**0.99**	**1.31**

For 2006, rates preceded by an asterisk are doubtful, since consistency could not be guaranteed in the transition from the previous Classification

infectious diseases"; it has even exceeded mortality from tuberculosis, which took a sharp upward turn again, probably partly due to the effect of AIDS.

This very sharp rise in mortality from infections (whether from tuberculosis or other infections) can be observed from the late 1980s among males and the early 1990s among females and was intensified by the very sudden emergence of AIDS; it is certainly the most striking phenomenon in trends in mortality from infections among young adults. One might think, of course, that the link between the rise in infectious diseases and the economic and social crisis is significant (whereas the link with alcoholism is very small), but the period of this new rise extended beyond the crisis itself. The fresh upsurge in tuberculosis and in other infections (apart from AIDS) began (for males in particular) well before the transition to a market economy and extended beyond 1995: while other causes of excess mortality due to the crisis retreated, these two rises merely paused just after the crisis, before picking up again even more vigorously over recent years. Of course, a fairly significant part of the recent dramatic rise in mortality from tuberculosis is attributable to the AIDS epidemic, since tuberculosis is one of the main opportunistic diseases in HIV infection; but the same cannot be said of other infectious diseases, which rose even more in 1999–2000. Moreover, we can hardly imagine that the jump of 0.2 points (from 0.2 to 0.4 per thousand) in the standardized mortality rate from tuberculosis at ages 15–39 between 1998 and 2000 results mainly from AIDS, which on its own is worth only 0.04 points. So, far from being entirely explained by AIDS, the fresh rise in mortality from tuberculosis (and from infectious diseases more generally) is evidence of a deterioration in living conditions and in public health in the broadest sense of the term. This deterioration is in turn linked to the weakening of policies that, in the past, had made the Soviet regime fairly effective in the field of infectious diseases, as well as to developing social insecurity, affecting a growing section of the population.

12.4 Causes of Death in Adults Aged from 40 to 64

In contrast to young adults (aged 15–39), middle-aged adults died above all from diseases of the circulatory system, not from injury and poisoning (Fig. 12.19). Mortality from diseases of the circulatory system increased strongly, particularly among males, yet was also very sensitive to the political and social events of the 1980s and 1990s. The fresh upsurge between 1999 and 2005 looks very much like a return to the long-term trend of the years 1965–1985, and so it is still too soon to say whether the latter has been thrown into reverse by the reduction observed in 2006. Although it was dominant, mortality from diseases of the circulatory system was followed fairly closely by mortality from cancers, in both males and females. The latter more or less increased for males until the early 1990s, while remaining stable for females. However, we should note that, for males, the 1990s were marked by a slight decline that echoes the findings already made for the previous age group.

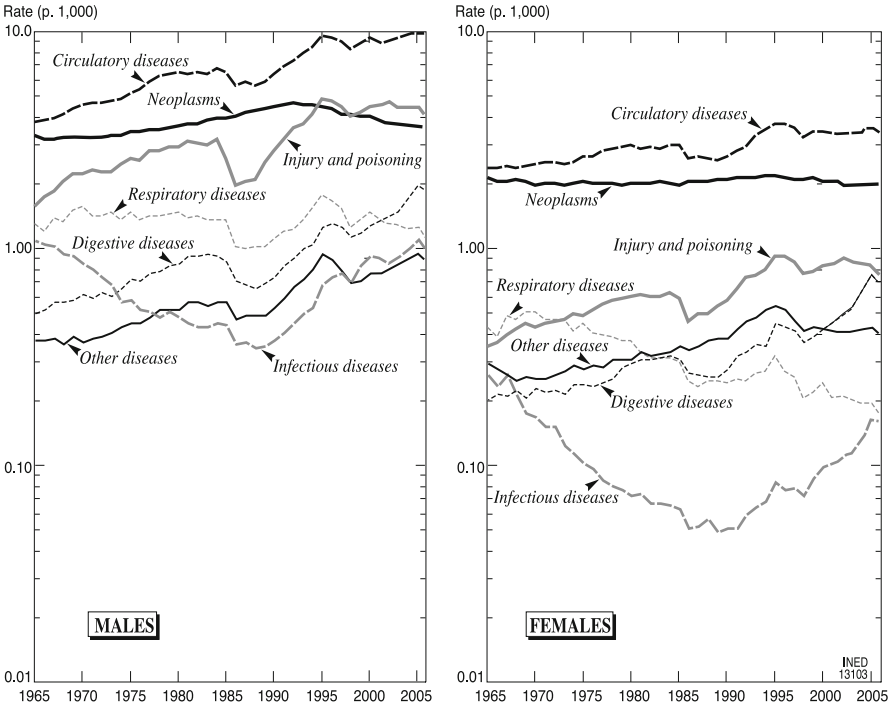

Fig. 12.19 Trends in standardized mortality rates by major groups of causes at ages 40–64, 1965–2006

With deaths from injury and poisoning, which are in third position, we see one of the key differences between the sexes: for each major group of causes, there were fewer female deaths than male, but the gap was particularly wide for deaths from injury and poisoning. Consequently, we can say that male mortality, especially in the recent period, has been dominated by three major groups of causes, since deaths from injury and poisoning now play an equal role with cancers, whereas among females they remain very far behind cancers. At the same time, as in the other age groups, all deaths from injury and poisoning increased over almost the whole period and were very sensitive to the major fluctuations in the 1980s and 1990s. Here too, the fresh increase between 1999 and 2002 continued the trend in a straight line from the rise that began in the 1970s. However, it is reasonable, more than for diseases of the circulatory system, to ask whether the stagnation of the years 2003–2005, followed by a significant decline in 2006, marks the beginning of a reversal in this trend, though, again, it is much too soon to come to a decision.

Although all the other groups of causes played only a secondary role, in this age group they involved levels of mortality that are not insignificant, and therefore they merit more detailed examination. We should note here that mortality from diseases of the respiratory system, in significant decline among females, hardly moved for males, other than when it reacted fairly strongly to political and social events.

As in the preceding age group, mortality from infections, after declining a great deal for both sexes (especially females), has been rising since the late 1980s. This rise was accelerated by the 1992–1994 crisis; the end of the crisis offset it for only a short time, and it has taken an upward turn again in recent years.

Finally, we should note that mortality from diseases of the digestive system and mortality from "other diseases" increased strongly for both sexes, but was much more sensitive to the 1980s and 1990s fluctuations among males than among females. Here again, the recent fresh upsurge (1999–2005) has been very sharp among males; among females, only diseases of the digestive system have shown a marked rise, and "other causes" seem to have stabilized (see Table 12.4 shown at the end of the Section 12.4).

12.4.1 Diseases of the Circulatory System

Among diseases of the circulatory system, four groups of diseases where mortality increased strongly for both sexes can be contrasted with three others that declined slightly (Fig. 12.20). In particular, mortality increased in the three dominant groups: cardiosclerosis, cerebrovascular disease and "other forms of ischaemic heart disease".

The very strong increase in mortality from "other forms of ischaemic heart disease" observed in the 1960s and 1970s for both males and females is very probably exaggerated. All studies show that the boundary between acute myocardial infarction and other forms of ischaemic heart disease is far from clear, and that it is generally impossible to maintain this distinction when making international comparisons or monitoring long-term trends (Meslé and Vallin 1993b; Meslé 1995). It seems to us that here Ukraine offers a new example of this difficulty in assessing mortality, so that it is certainly more reasonable to combine these two groups and merely note that, apart from a distinct slowdown in the early 1980s, together they led to a relatively regular rise in mortality over the whole period (Fig. 12.21). Even once these two groups of circulatory conditions have been combined, the Soviet Classification item "atherosclerotic cardiosclerosis" (called 'cardiosclerosis' here, for simplicity) remained the main cause of death from diseases of the circulatory system in the 40–64 age group (in women, equal with cerebrovascular disease). Strictly speaking, cardiosclerosis is a particular type of ischaemic heart disease. However, it is obvious that the Soviet statistical practice was to place far more conditions under this item than just ischaemic heart disease. We have already emphasized that, in Russia, just these two relevant items in the Soviet classification[5] covered half or three quarters of deaths from heart diseases, all ages combined (Meslé et al. 1996). In Ukraine in 2006, the proportion was 70% for males and 80% for females, and absolutely

[5]The Soviet classification distinguishes between atherosclerotic cardiosclerosis "with hypertension" (Item 92) and "without hypertension" (Item 93), a distinction that is not particularly significant, and one which we discarded from our analysis at the outset.

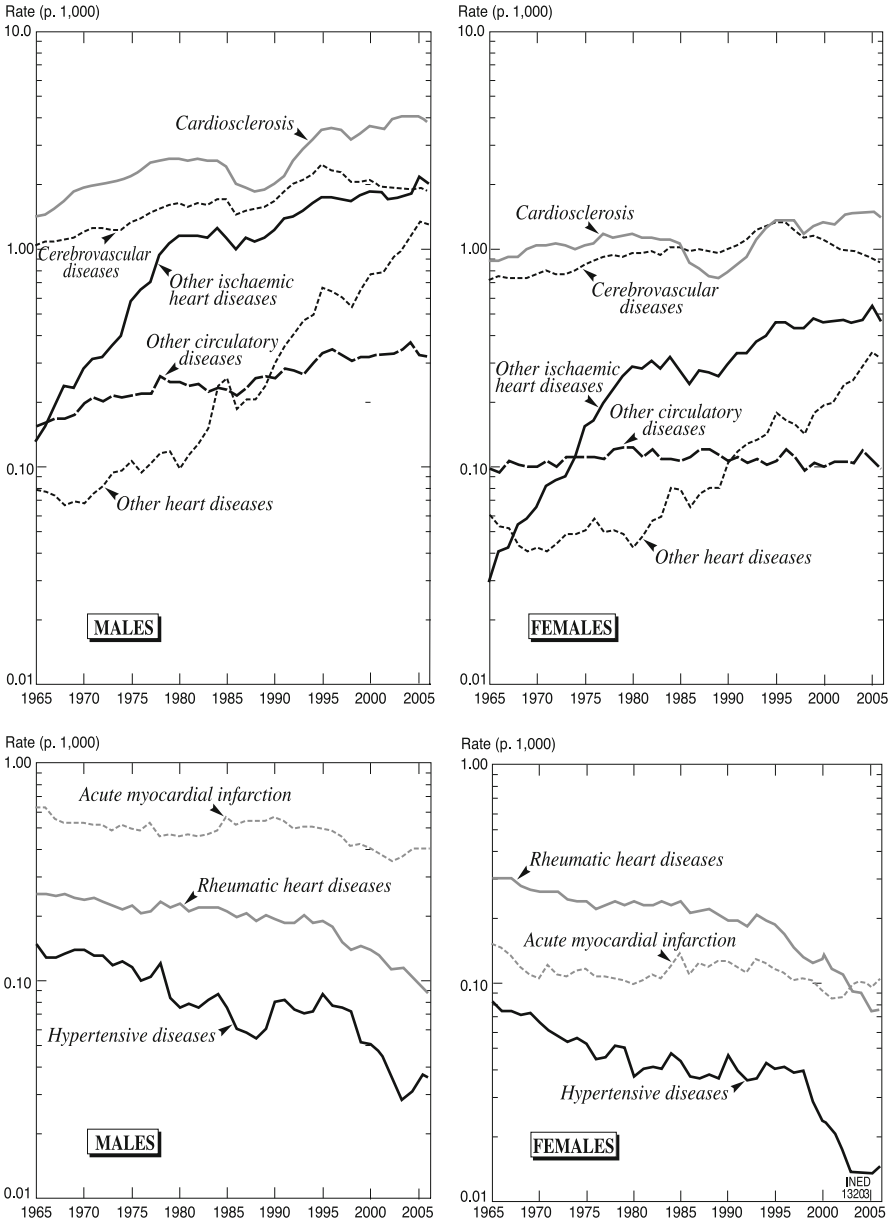

Fig. 12.20 Trends in standardized mortality rates for diseases of the circulatory system at ages 40–64, 1965–2006

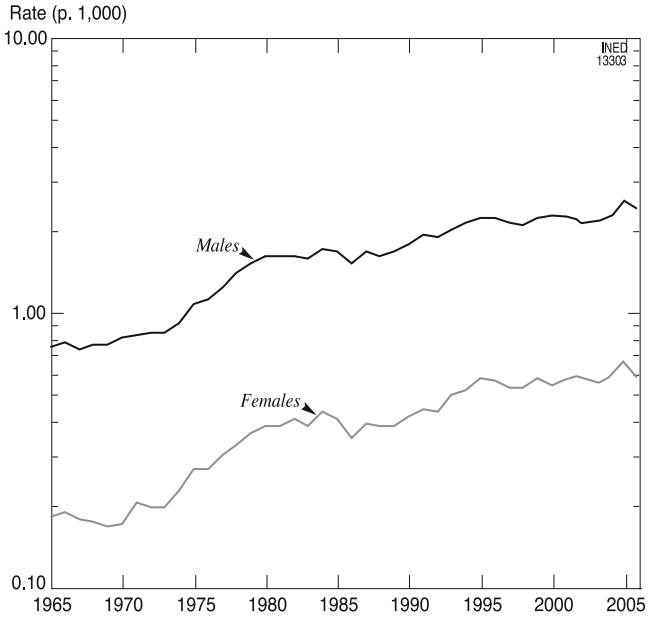

Fig. 12.21 Trends in standardized mortality rates for ischaemic heart disease (excluding cardiosclerosis) at ages 40–64, 1965–2006

analogous proportions are to be found in the other countries of the former USSR. In contrast, in France, less than 5% of cardiac deaths are classified under the corresponding ICD heading, 'coronary atherosclerosis' (Item 414.0 in ICD-9).

In fact, a very large part of the deaths attributed to cardiosclerosis probably relate to wrongly-identified circulatory disease. The proportionately very small role played by the "other forms of heart disease" group supports this hypothesis. Not only is this already apparent from Fig. 12.20 for this age group, but it is even more obvious when we consider all-age mortality: in 2006, all "other forms of heart disease"[6] covered only 5% of total male deaths from heart disease in Ukraine and 3% of female, as against 25% and 60% respectively in France.[7]

In the case of Ukraine, therefore, and more generally in the countries of the former USSR, mortality from cardiosclerosis covers many causes of death other than ischaemic heart disease and probably serves mainly as a catch-all category for ill-defined heart diseases. At the same time, for both males and females aged 40–64, this mortality did increase throughout the whole period and was very sensitive to political and social events in the 1980s and 1990s and to the fresh rise in 1999–2000 (Fig. 12.20). Furthermore, it seems to be almost solely through this category that

[6]Here two items from the Soviet Classification are combined: "unspecified disorders of pericardium, mitral and aortic valves" (Item 96) and "other heart diseases" (Item 97).

[7]In 1996.

these events made a strong mark on overall mortality from diseases of the circulatory system (Fig. 12.19).

Cerebrovascular diseases, which are the second largest cause of death from diseases of the circulatory system, and in females even equal cardiosclerosis, were also marked by a large rise from 1965 onwards, at least until 1995. However, they were hardly affected at all by either the anti-alcohol campaign or the economic and social crisis of the 1990s, and since 1995 they have been conspicuous by their fairly pronounced decline, especially among females; and this time, it seems we can confirm this as a true reversal of the unfavourable trend in earlier decades.

Mortality from rheumatic heart diseases, which occupy a much lower position than the other groups of circulatory conditions already mentioned, has fallen regularly over the whole period. However, we should note that, at this age, the decline in these conditions has been much less rapid than that observed among young adults (Fig. 12.14).

12.4.2 Neoplasms

The 40–64 age group is the one where the relative importance of neoplasms is greatest, since in the preceding age group mortality is much more dominated by deaths from injury and poisoning and in the next one, by diseases of the circulatory system. Therefore here we should focus in a little more detail on trends in mortality from neoplasms, according to their various sites.

Figure 12.22 traces mortality trends for those neoplasms that we know are most closely linked to tobacco and alcohol consumption. The difference between males and females is, in this case, so great that it has been possible to present both sexes in the same figure. Neoplasms of the respiratory organs, which occupy by far the largest place, have led to ten times as much mortality among males as among females, and nowadays there is an even larger gap for neoplasms of the nose, mouth, pharynx and oesophagus. Another difference between males and females relates to the fact that a certain stability among females contrasted with a strong upward trend for males, at least until the early 1990s.

Among males, mortality from malignant neoplasms of the respiratory organs showed a strong rise until the late 1980s, but then stabilized and even began to decline in the mid-1990s. The rising phase corresponded, as it does everywhere, to increased tobacco consumption (Doll and Peto 1981). The latter was in part linked to the rise in Soviet living standards during the Brezhnev years; this resulted from growth in economic output based on industrialization, which caused pollution that in turn also contributed to the rise in neoplasms of the respiratory organs (Hill et al. 1997). Conversely, the economic recession in the late 1980s and then, finally, the major crisis triggered by the transition to a market economy reduced industrial pollution emissions and altered tobacco consumption habits (through price increases and the wider availability of less harmful imported tobacco products). We can also hypothesize that the decline in mortality from malignant neoplasms of the respiratory

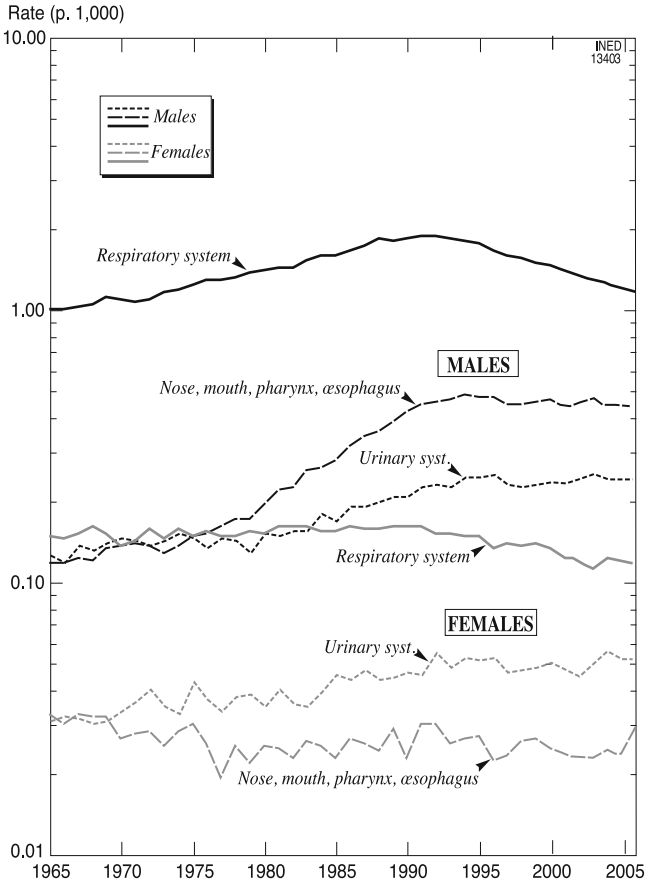

Fig. 12.22 Trends in standardized mortality rates for neoplasms linked to smoking and to alcoholism, ages 40–64, 1965–2006

organs is explained at least in part by the explosion in mortality from other causes resulting from the 1992–1995 economic and social crisis; this carried off a growing number of people suffering from cancer before they had time to die from the disease (Shkolnikov et al. 1999).

The rise in mortality from "malignant neoplasms of the nose, mouth, pharynx and oesophagus" was even greater than that in mortality from respiratory neoplasms, but in the mid-1990s this too gave way to a slight decline. It is known that cancer of the oesophagus is strongly linked to alcohol consumption and that cancer of the lip, oral cavity and pharynx is particularly associated with co-occurring alcohol and tobacco use (Tuyns 1982; Mahboubi and Sayed 1982; Wynder and Bross 1961; Austin 1982). That being the case, it may seem astonishing that at the time of Gorbachev's anti-alcohol campaign, trends in mortality from this group of causes did not deviate from their course at all. In fact, this particular consequence of alcoholism involves a long latent period, and the effects of immediate factors are both deferred and diluted over time. Therefore, it is in no way possible to ascribe the fall in mortality

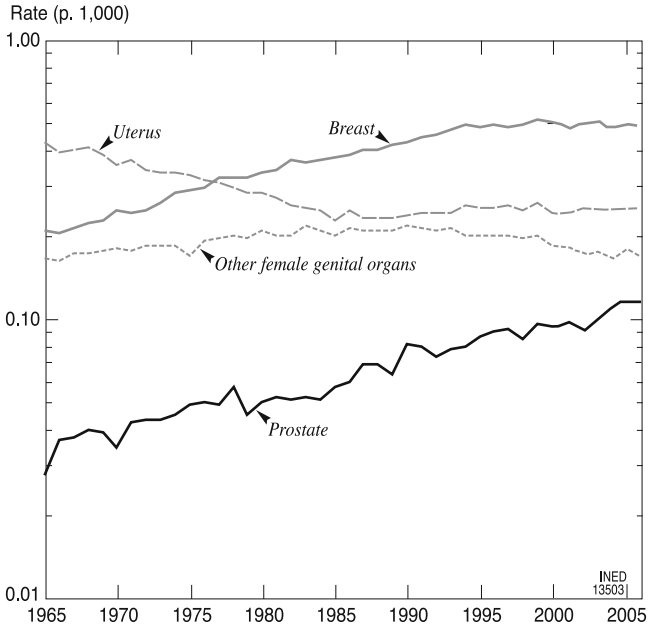

Fig. 12.23 Trends in standardized mortality rates for neoplasms of breast and of genitourinary organs at ages 40–64, 1965–2006

that has begun recently to the deferred benefits of the anti-alcohol campaign, since reaction times vary a great deal from one individual to another. On the other hand, this recent reduction can probably be likened to the situation we have described for respiratory neoplasms, since the neoplasms of lip, oral cavity and pharynx that dominate this group are also dependent on atmospheric pollution and tobacco consumption. However, the slight improvement that followed the 1992–1994 crisis did not continue, and the mortality rate has been stagnant since the early 2000s.

The Soviet Classification did not distinguish between different types of malignant neoplasms of urinary organs. However, a good number of these are cancers of the bladder, which are also known to be influenced by tobacco consumption (The Surgeon General 1982; Rosenberg 1987). The slow increase in male mortality observed for all urinary cancers accelerated from the 1980s onwards. However, since trends in the distribution of this mortality, notably between kidney cancer and bladder cancer, are unknown, it is impossible to track tobacco consumption trends clearly here.

Figure 12.23 brings together the various cancers linked to reproductive functions: breast, uterus or other genital organs for females, prostate for males.

For this age group (more than for the preceding one) we observed the same contrast in Ukraine as in most industrial countries, between a significant fall in mortality from cancer of the uterus and an increase in mortality from breast cancer. However, following on from what we recorded above for the preceding age group, we find that the fall in mortality from cancer of the uterus came to a halt from the second half of the 1980s onwards, reinforcing the idea we have already put forward,

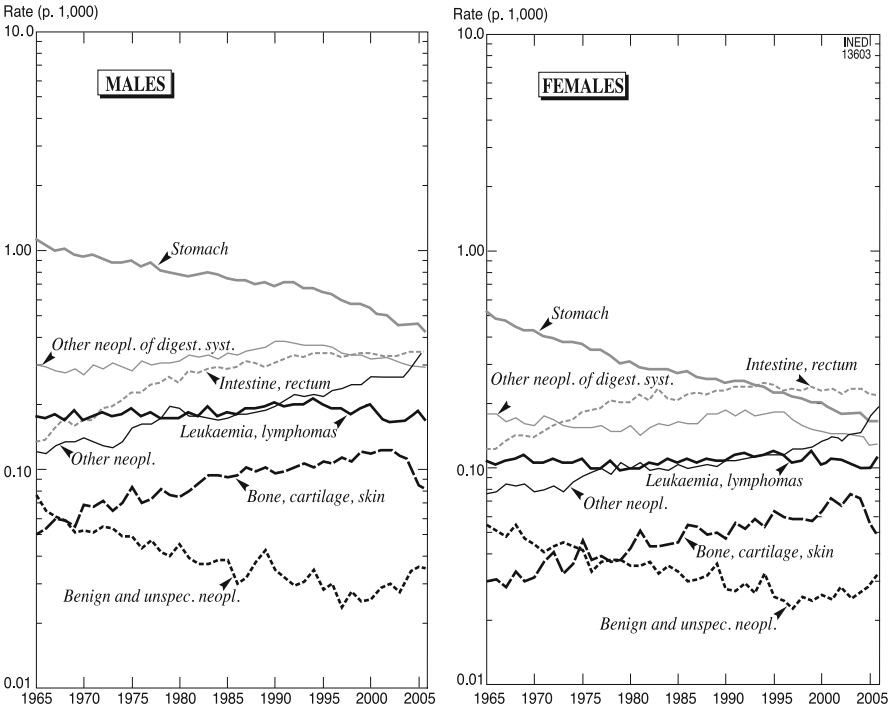

Fig. 12.24 Trends in standardized mortality rates for neoplasms at other sites, ages 40–64, 1965–2006

that gynaecological monitoring became somewhat more lax. Conversely, the slowdown in the rise in mortality from breast cancer that we saw among younger women from the 1980s onwards gives way here to a persistent increase until the mid-1990s, and then to stagnation in the most recent years. We know that the incidence of breast cancer is increasing in all industrial countries (Coleman et al. 1993) but that over recent decades, there has been a slowing, and in recent years even a halt, in the rise in mortality, thanks to early screening and improved treatments. In Ukraine, as in the other former countries of the Soviet Union, these kinds of advances have not been sufficiently widespread to alter the course of mortality from breast cancer.

At these ages, mortality from prostate cancer still occupies only a fairly modest place. However, we should note that it increased strongly over the whole period.

Among the other sites of malignant neoplasms (Fig. 12.24), we find the same classic opposition in Ukraine as in other industrial countries, between the fall in mortality from stomach cancer and the rise in mortality from cancer of the intestine. This contrast is even stronger than in most Western countries, since the increase in mortality from cancer of the intestine was greater in Ukraine. Among females, trends have been such that in the late 1990s, mortality from malignant neoplasms of the stomach was overtaken by mortality from cancer of the intestine. Among males, these two types of mortality have not yet completely aligned, but were on their way

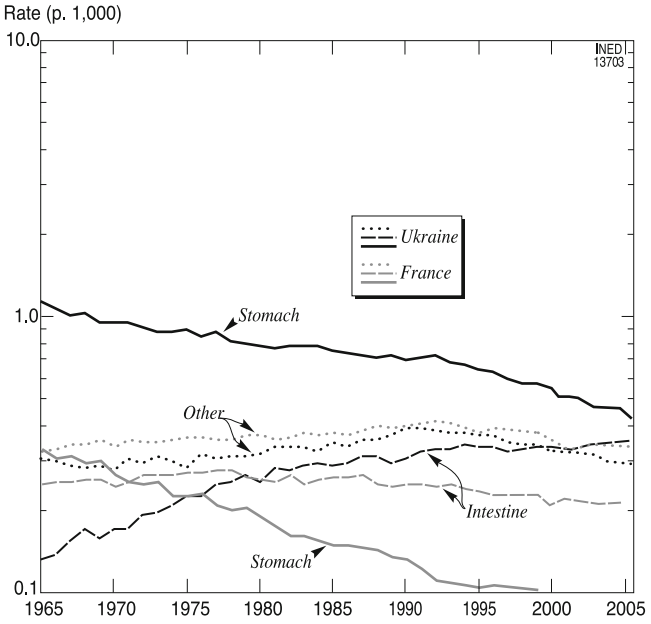

Fig. 12.25 Trends in standardized male mortality rates for neoplasms of digestive organs, Ukraine and France, ages 40–64, since 1965

to doing so in 2006. It may be supposed that, in Ukraine as elsewhere, the fall in mortality from stomach cancer is mainly due to changes in diet and cooking methods: the increased proportion of dairy products and raw foods, and the reduction in salt-pickling and charcoal-grilling (McBean and Speckmann 1982). Yet eating habits are also the main source of the increase in mortality from cancer of the intestine, which represents a fairly large proportion of the rest of this group.

However, even though trends in the structure of digestive cancers observed in Ukraine are very similar to those in other industrial countries, mortality rates are much higher than in Western countries. The contrast with France is particularly marked, as Fig. 12.25 shows for males.

Firstly, mortality from stomach cancer is much lower in France than in Ukraine, and the gap has only widened since 1965: the standardized mortality rate for the 40–64 age group, which was three times higher in Ukraine than in France in 1965, is today more than five times higher. Secondly, over the same period, mortality from cancer of the intestine has remained stable in France while it has increased strongly in Ukraine; this makes it higher nowadays in Ukraine than in France, whereas in 1965 the reverse was observed. In short, it cannot be said that this relative deterioration for cancers of the stomach and of the intestine in Ukraine is balanced by a movement in the opposite direction for other neoplasms of the digestive organs, since the mortality attributable to the latter has remained more or less equal between the two countries over the whole period.

What is more, leukaemia and lymphomas, which even at this age occupy a fairly significant place in mortality from cancer, remained almost stable over the whole

period. Contrary to what we may have observed among males in the previous age group, here the Chernobyl disaster does not seem to have had any influence on mortality from these neoplasms.

Mortality from malignant neoplasms of bone, cartilage and skin, which is on the rise, and mortality from benign or unspecified neoplasms, which is declining, play only a secondary part.

12.4.3 Deaths from Injury and Poisoning

Mortality from injury and poisoning increased among males for all causes, but in fairly different ways; in particular, there were wide variations in sensitivity to political and social events (Fig. 12.26). So that it will be easier to read, the first part of Fig. 12.26 highlights just the four categories of such deaths that reacted very strongly to both Gorbachev's anti-alcohol campaign and the economic and social crisis that followed the break-up of the USSR and the transition to a market economy: accidental alcohol poisoning, homicide, 'injury undetermined whether accidentally or purposely inflicted' and "other accidents".

In 2 years, from 1984 to 1986, the anti-alcohol campaign led to a decline of almost 50% in male mortality from alcohol poisoning, homicide and 'injury undetermined whether accidentally or purposely inflicted', and to a decline of almost 40% in male mortality in the "other accidents" group; but the second part of Fig. 12.26 shows that other causes were also sensitive to the anti-alcohol campaign, such as suicide and the 'drowning and falls' category, which fell by more than 40%, or transport accidents (−28%) and accidental poisoning by other substances (−25%).

However, after the anti-alcohol measures were relaxed, mortality from these external causes did not rise any higher than predicted by the previous trend. On the other hand, the causes singled out in the first part of Fig. 12.26 went up to a much higher level. This was particularly the case for homicide, where the rate was three times higher in 1995 than in 1984, and even more so for 'injury undetermined whether accidentally or purposely inflicted', which in 1995 led to mortality four times higher than in 1984. This explosion in such 'undetermined' injuries, more dramatic than the rise in all clearly identified forms of injury, certainly resulted from the crumbling of the social fabric; this not only increased the risk of violence but also led to a deterioration in knowledge of these causes, since so many more people were found dead with no witness to the event.

In contrast, at this age we again find the fall in mortality from transport accidents already mentioned in relation to young adults. As we suggested above, this decline was very probably due to the reduction in automobile traffic resulting from fuel shortages.

For all the causes shown at the top of Fig. 12.26, those that were sensitive to political and social events in the 1980s and 1990s, we should also note a fresh upsurge from 1999 onwards, after the improvement that had at first followed the economic and social crisis. However, for homicide this new rise was very short (1999–2000), and although the other causes sustained it a little longer (1999–2004),

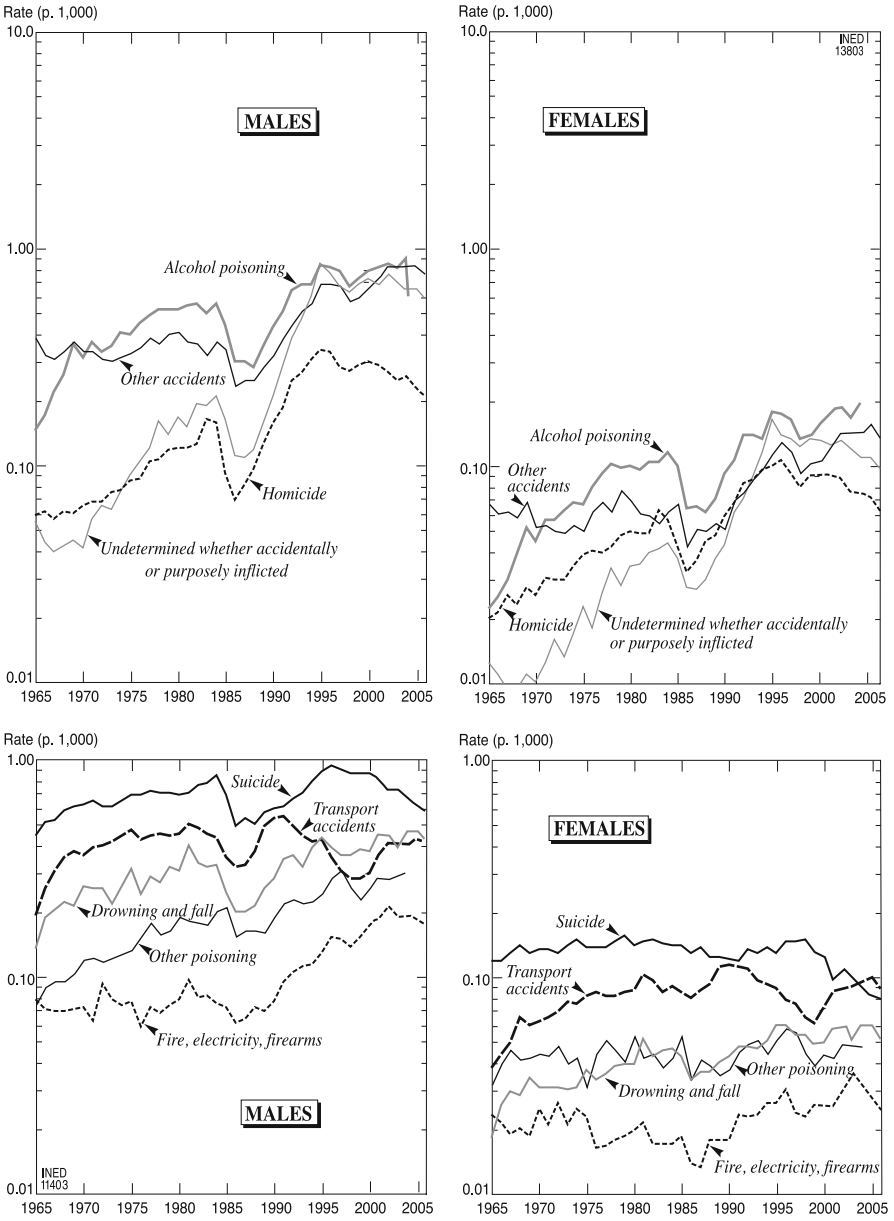

Fig. 12.26 Trends in standardized mortality rates at ages 40–64 since 1965: deaths from injury and poisoning (N.B. The "alcohol poisoning" and "poisoning by other substances" series are not shown beyond 2004 because since 2005, Ukrainian statistics have no longer distinguished alcohol poisoning from poisoning by other substances)

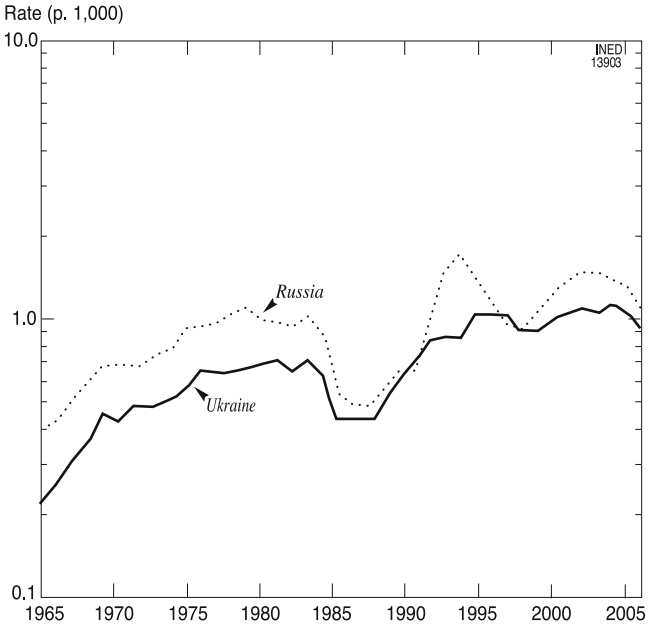

Fig. 12.27 Trends in standardized male mortality rates for accidental poisoning at ages 40–64, Ukraine and Russia, since 1965

in most recent years they have all seen a new decline. Among the causes shown at the bottom of Fig. 12.26, which had been less systematically sensitive to earlier events, only three were affected by a fresh upsurge at the turn of 1999/2000 (transport accidents; poisoning by substances other than alcohol; fire, electricity and firearms) but, by the end of the period, transport accidents represented the only category still on the rise.

For some of these causes of death from injury and poisoning, it may be worth comparing the situation in Ukraine with that in Russia or even France. The case of accidental poisoning (Fig. 12.27) offers very comparable patterns in trends for Ukraine and Russia[8] (unfortunately, the comparison cannot be extended to France because of the very specific Soviet way of classifying deaths from excess alcohol consumption). However, although they were extremely similar, the fluctuations were much more pronounced in Russia than in Ukraine. The fall that followed the anti-alcohol campaign was much greater in Russia than in Ukraine. So, although traditionally this type of mortality was higher in Russia, the two countries drew level during the period 1986–1991. Conversely, the fresh upsurge observed in the early 1990s was much sharper in Russia, clearly reflecting the difference between the tempo of the

[8] Here we group together all types of accidental poisoning, whether they are due to alcohol or not, in order to be able to carry the comparison as far as 2006, despite the fact that since 2005 Ukrainian statistics have no longer distinguished alcohol poisoning from other poisoning. In fact, the part played by "accidental poisoning by other substances" is too small (barely 25% in 2004) to have a significant influence on overall trends, which are entirely dominated by alcohol poisoning.

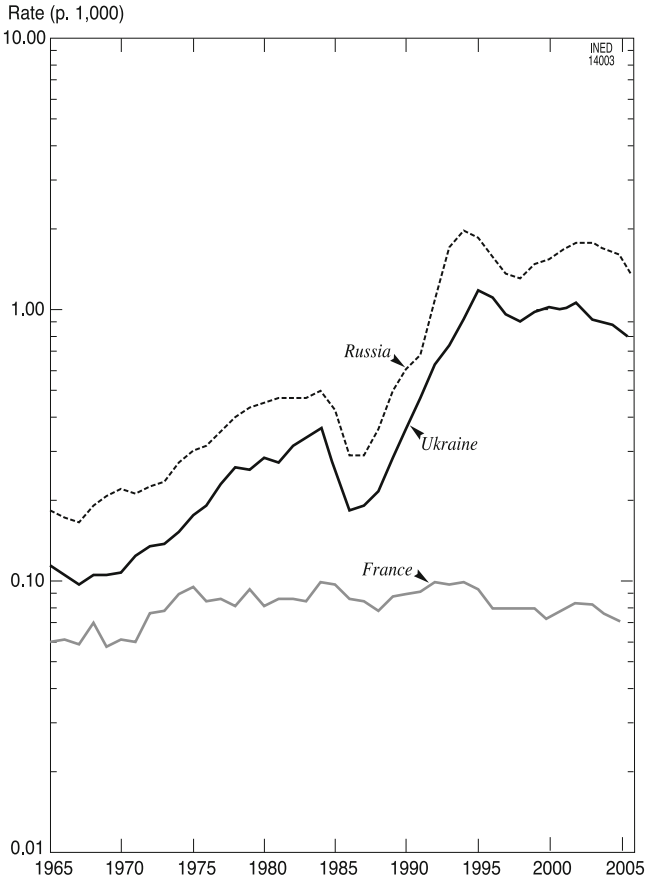

Fig. 12.28 Trends in standardized male mortality rates for homicide or injury undetermined whether accidentally or purposely inflicted, ages 40–64, Ukraine, Russia and France, since 1965

economic and social crisis in Russia and in Ukraine. Once the crisis had passed, the two countries came into line again, but the increase in 1999 and 2003 was much greater in Russia, and this distanced them once more. In both countries, however, the most recent years have been marked by a clear decline, which has again brought them closer together, since it was a little later in Ukraine than in Russia. So Ukraine and Russia have clearly undergone the same fluctuations in mortality from poisoning; but these fits and starts were much more violent in Russia than in Ukraine, where the mortality rate has been similar to Russia's only in the latter's most favourable periods.

The close similarity in the patterns observed in Fig. 12.26 for homicide and for 'injury undetermined whether accidentally or purposely inflicted' led us to group these two items together in order to compare Russia, Ukraine and France from this point of view. This time, Ukraine and Russia are exactly alike: not only are the same fluctuation curves to be found in both countries, but they are the same size (Fig. 12.28). On the other hand, mortality in Ukraine has been constantly lower than

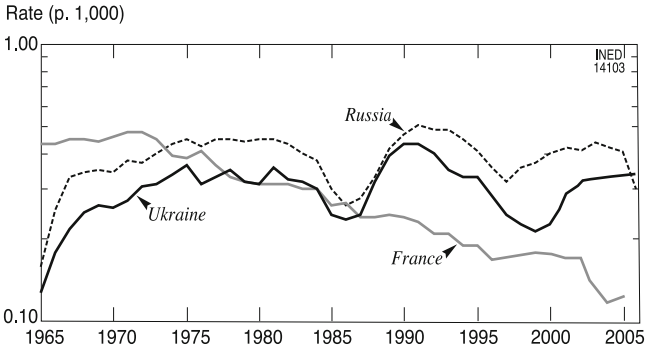

Fig. 12.29 Trends in standardized male mortality rates for road traffic accidents, Ukraine, Russia and France, ages 40–64, since 1965

in Russia (in the order of 40–50%). The comparison with France, where mortality from homicide and 'undetermined' injury is very stable, shows how much Russia and Ukraine, like the other European countries of the former USSR, suffer from crime and also how far this situation has deteriorated: in 1965, mortality from this group of causes in Ukraine was double that in France, while in Russia it was three times greater, but in 2005 it was 12 times greater in Ukraine than in France and 23 times greater in Russia!

Things are very different in regard to road traffic accidents, which, until the recent period, have caused at least as much mortality in France as in Ukraine and Russia (Fig. 12.29). However, because road deaths have been in constant decline in France since the early 1970s, the gap has widened to the disadvantage of the other two countries, despite recent fluctuations. The 1985 anti-alcohol campaign put the three countries on the same level, but with the relaxation of those measures, Ukraine and Russia reached much higher road death rates than France, and the traffic reduction linked to the crisis was not enough to entirely close the gap. From 1998, road deaths started to rise again in Russia; they did so in Ukraine only from 2000 onwards, but even more sharply; and, because Ukraine did not benefit from the clear decline observed in Russia in 2005–2006, it reached a mortality rate from road traffic accidents in 2006 that was even slightly higher than the Russian one. In 2005, the latest year available for France, Ukrainian and Russian road deaths were almost three times greater than French ones. However, we should note that this comparison is very strongly biased against France, since automobile traffic is much heavier in France than in Ukraine or Russia: a comparison in terms of deaths per kilometre travelled would reveal an even more glaring contrast.

All these comments about mortality from injury and poisoning among males also apply to this type of mortality among females, but with one slight yet significant difference: trends were a little less unfavourable and fluctuations practically absent from the causes grouped together in the second part of Fig. 12.26 (suicide, transport accidents, drowning and falls, etc.).

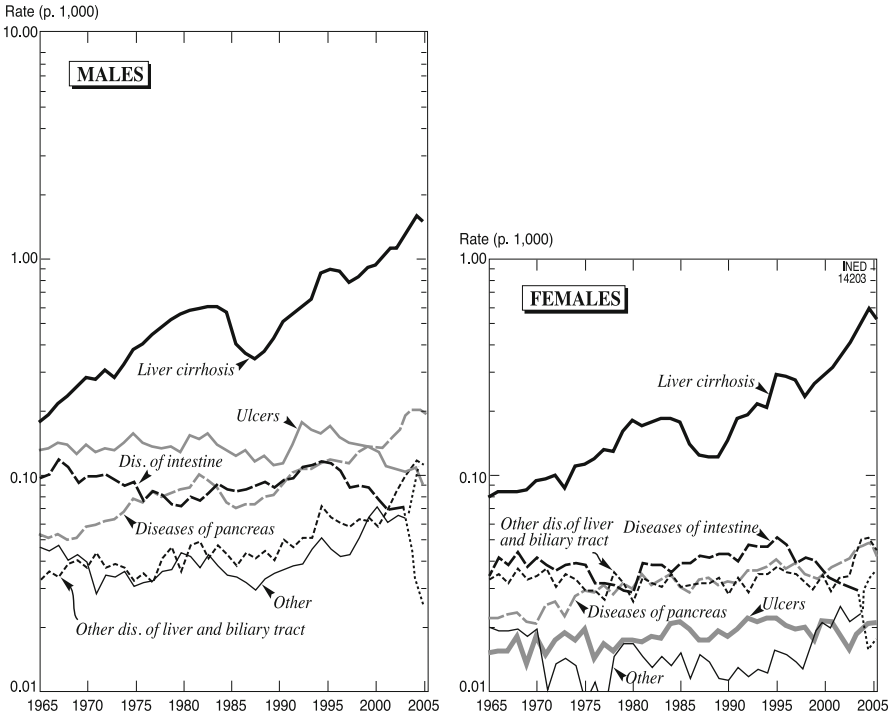

Fig. 12.30 Trends in standardized mortality rates for diseases of the digestive system, ages 40–64, since 1965

12.4.4 Diseases of the Digestive System

Although the pathological consequences of alcoholism in Ukraine, as in the other countries of the former USSR, mainly take the form of acute alcohol-induced crises, and the deaths that ensue are for the most part classified under the item for alcohol poisoning, nevertheless mortality from cirrhosis of the liver occupies a significant place. In this adult age group, it represents by far the most common cause of death from digestive diseases (Fig. 12.30). In addition, it has increased very strongly over recent decades, almost as much as mortality from alcohol poisoning, and (which might be surprising, since cirrhosis of the liver is a condition that develops much more slowly than acute alcoholism) it underwent equally large fluctuations in the 1980s and 1990s. However, we have already noticed this sensitivity of cirrhosis to political events, even in a country like France, where it occupies a significant place in adult male mortality (Vallin and Meslé 1988). In particular, it declined abruptly there in 1958–1959, following a sharp increase in the price of wine (Meslé and Vallin 1993a). Although cirrhosis is indeed a slow-developing disease, mortality from cirrhosis at a given point in time also depends on the

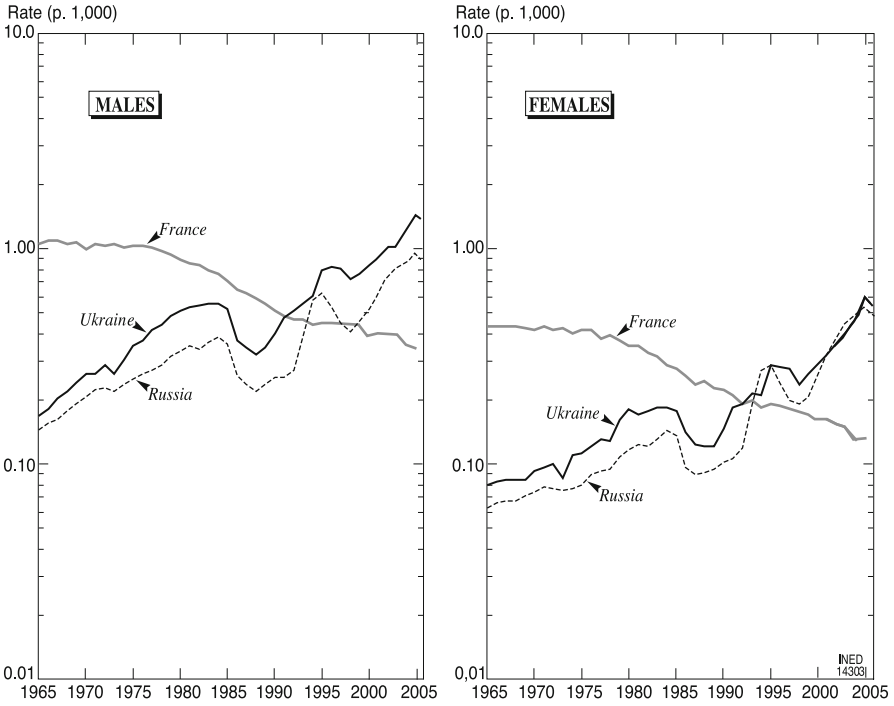

Fig. 12.31 Trends in standardized mortality rates for cirrhosis of the liver, Ukraine, Russia and France, ages 40–64, since 1965

quantity of alcohol recently ingested, and if there is a strong decline in alcohol consumption, a large proportion of the potential deaths from cirrhosis of the liver will be delayed. This is why Gorbachev's anti-alcohol campaign led to as great a decline in mortality from cirrhosis as in mortality from alcohol poisoning. Similarly, when alcohol consumption rose again, mortality from cirrhosis climbed rapidly once more.

Even so, until recently mortality from cirrhosis was not as significant as in France, where it is the main cause of alcohol-induced mortality. In 1965, the standardized male mortality rate from this cause at ages 40–64 was six times higher in France than in Ukraine (Fig. 12.31). However, the rise of alcoholism in Ukraine and its decline in France have reversed this situation in just a few decades. In 2005, mortality from cirrhosis of the liver was more than four times higher in Ukraine than in France. Finally, comparison with Russia shows that although their paths are almost precisely parallel (same long-term increase, same sensitivity to political events), male mortality from cirrhosis in Ukraine has been constantly higher than it has in Russia, whereas we saw the reverse for mortality from alcohol poisoning. This should probably be seen in relation to noticeably different alcohol consumption habits in the two countries: binge-drinking spirits (vodka) probably plays a smaller

role in Ukraine than in Russia, while the habit of regularly consuming less strong alcohol in the form of wine or beer is more prevalent in Ukraine.

The trends in mortality from cirrhosis of the liver and the comparisons made with France and Russia apply just as much to females as to males (Fig. 12.31), except that mortality is much lower in females and, for them, there is hardly any difference between Ukraine and Russia.

Among the other diseases of the digestive system, it is stomach ulcers that come second in terms of mortality, but a fairly long way behind cirrhosis; and this is even more the case nowadays, because this cause of death has increased much less over recent decades. However, the sudden increase in male mortality from stomach ulcers that accompanied the 1992 economic and social crisis must be noted, even though this cause of death had remained completely insensitive to the fluctuations associated with the anti-alcohol campaign. This provides additional evidence of the way disease patterns differed between the fluctuation in the 1980s and the one in the 1990s. This phenomenon cannot be seen among females, but males are known to be more sensitive to stomach ulcers, notably in their psychosomatic forms.

Mortality from diseases of the intestines was fairly stable throughout the period, while mortality from diseases of the pancreas tended to increase for both sexes. Other diseases of the digestive system played only a small part in adult mortality in Ukraine.

12.4.5 Infectious Diseases and Diseases of the Respiratory System

As we have already emphasized in relation to the previous age group, in Ukraine mortality that is classified as infectious is very largely dominated by tuberculosis. Among Ukrainian males, this disease alone caused over ten times as much mortality as was attributed to all other infectious diseases (Fig. 12.32). Among females, it was less predominant, and the gap closed somewhat as mortality from tuberculosis fell faster than mortality from other infectious diseases. All the same, in 1965 female mortality from tuberculosis was five times higher than from other infectious diseases, and nowadays it is still three times higher.

The very sharp rise in mortality from tuberculosis observed since the late 1980s in males and since the early 1990s in females cannot be ascribed to AIDS, even less than in the 15–39 age group. Not only has its tempo been very different, but adult mortality from AIDS is almost entirely concentrated in that previous age group. Even though the fresh upsurge in tuberculosis was accentuated by the economic and social crisis, the latter is simply not sufficient to explain either its extent or its continuous nature. It resulted more from a profound transformation in society, with growing marginalization of the most deprived section of the population, than from a deterioration in immediate living conditions.

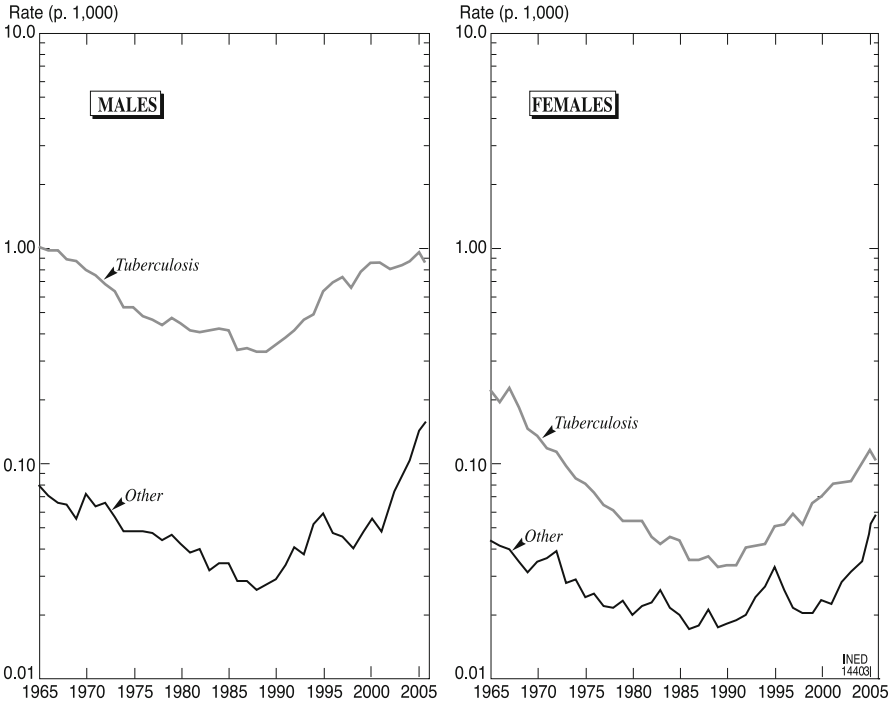

Fig. 12.32 Trends in standardized mortality rates for infectious diseases, ages 40–64, since 1965

As we know, not all infectious diseases are grouped together in the category that bears this name. Of the other chapters in the Classification, 'Diseases of the respiratory system' is probably the one that includes most infectious diseases. On the other hand, in the 40–64 age group, the main causes of respiratory mortality fall more under the category of chronic conditions than under acute infections. In Ukraine, the foreground in this category is occupied jointly by chronic bronchitis and pulmonary congestion (Fig. 12.33). However, since 1965, trends in mortality from these two groups of conditions have been very different.

Until the early 1980s, mortality from pulmonary congestion, which was very stable, was the highest; however, it fell abruptly between 1982 and 1990 (to almost a tenth) and then again between 1995 and 2004, following the 1993–1994 crisis, and nowadays it plays only a marginal role (the rate is 100 times lower than in 1965). Conversely, mortality from bronchitis increased abruptly between 1982 and 1985. There is certainly an artificial element to these movements in opposite directions, because, in the first half of the 1980s, diagnostic and coding practices probably to some extent abandoned pulmonary congestion in favour of chronic bronchitis. However, this simple shift in definition does not explain everything, since the fall in mortality from pulmonary congestion continued long after the steep rise in chronic bronchitis. Moreover, in the 1970s, while pulmonary congestion was very stable, chronic bronchitis went into decline, without any clear explanation. This decline probably

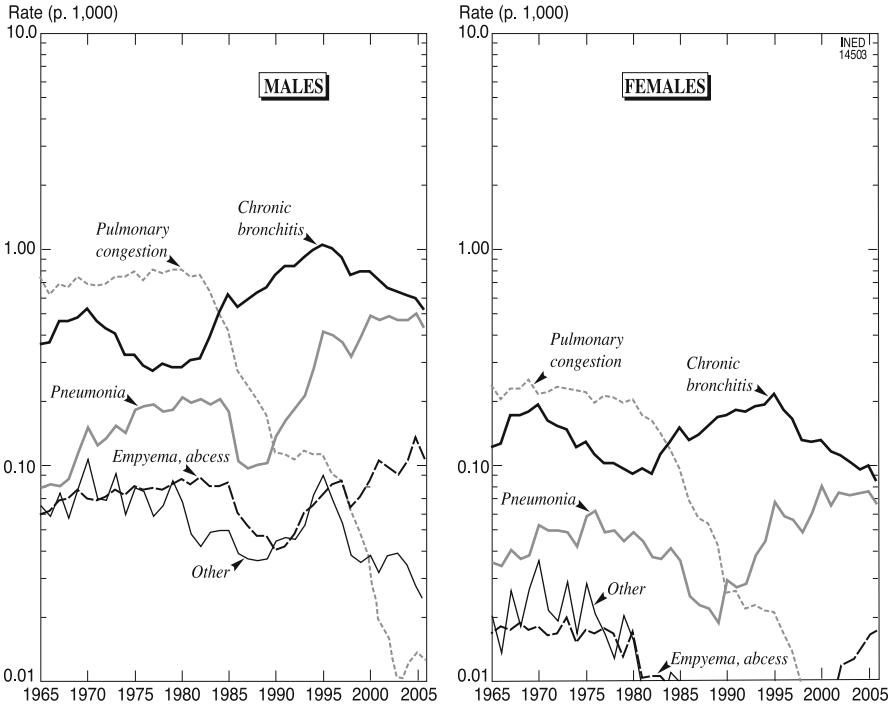

Fig. 12.33 Trends in standardized mortality rates for diseases of the respiratory system, ages 40–64, since 1965

results from other, more complex transfers between pulmonary congestion and items other than chronic bronchitis; but the available data does not really allow us to specify which ones.

Mortality from pneumonia is a classic example of a cause of death that reacted strongly to the great 'health events' in the 1980s and 1990s. It first of all declined very sharply under the impact of the anti-alcohol campaign, then, on relaxation of the prohibition measures, went back up fairly rapidly to its earlier level. But this fresh upsurge accelerated abruptly with the 1992–1994 economic and social crisis, and it also picked up again after the short period of decline that followed the latter. So, with a path very similar to that taken by tuberculosis, pneumonia behaved more like an acute infectious disease than a chronic one.

The other diseases of the respiratory system played a smaller role.

12.4.6 Other Diseases

Of all other diseases, only diseases of the nervous system, diseases of the genitourinary system and endocrine diseases played an appreciable role in the mortality of adults aged 40–64 (Fig. 12.34).

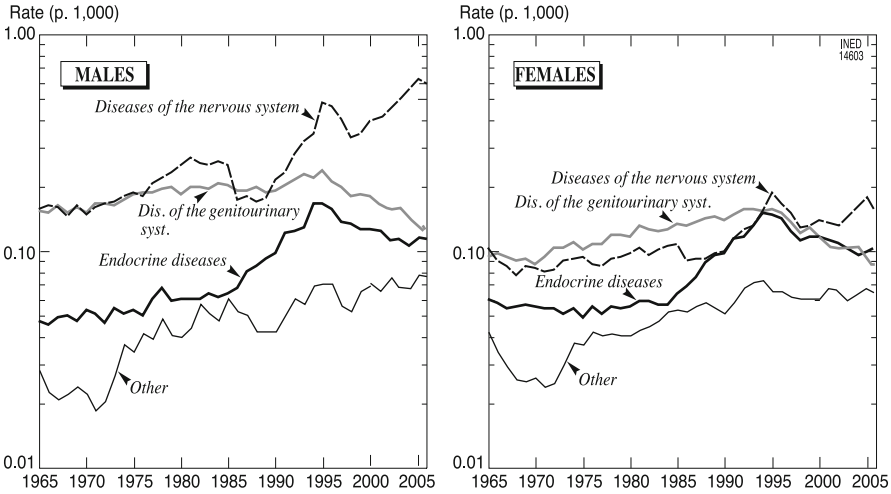

Fig. 12.34 Trends in standardized mortality rates for other diseases, ages 40–64, since 1965

Mortality from diseases of the nervous system, as we have already seen in relation to young adults in the previous section, increased strongly and also proved very sensitive to both Gorbachev's anti-alcohol campaign and the 1992–1995 economic and social crisis, as well as to the new rise at the turn of the century; this continued until 2004, reaching a much higher level than in the 1993–1994 crisis. We could go into more detail about this category of causes of death, but we would merely be repeating what we have already said about young adults in the 15–39 age group (Fig. 12.17): naturally, the anti-alcohol campaign and its abandonment had the greatest impact on mortality from alcohol dependence syndrome, which was hardly influenced at all by the social and economic crisis, whereas mortality from other mental disorders, insensitive to the anti-alcohol campaign, rose abruptly with the crisis.

So it seems more helpful to give details here about the second largest group of causes, diseases of the genitourinary system. In this category, in contrast, mortality trends have not been influenced at all by political and social events, instead showing a slight but very regular increase over the whole period (Fig. 12.34).

In fact, this relative stability combines stagnation followed by a steady decrease in the largest component of the group – mortality from nephritis – with a strong increase in mortality from kidney infections, which, by the end of its trajectory, was much closer to mortality from nephritis and, in females, even reached the same level (Fig. 12.35).

All the other causes of death in this group, including hyperplasia of the prostate in males, play only a secondary role in mortality at this age.

Table 12.4 Causes of death at ages 40–64: groups of items used (with corresponding ICD-9 items) and trends in mortality rate between 1965 and 2006

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Infectious and parasitic diseases	**1 to 44, 206**	**001 to 139**	**3 to 57**	**1.08**	**0.98**	**0.26**	**0.16**
Tuberculosis	9 to 13, 43	010 to 018, 137	11 to 17, 56	1.00	0.82	0.22	0.10
Other infectious and parasitic diseases	1 to 8, 14 to 42, 44, 206	001 to 009, 020 to 138, 139	3 to 10, 18 to 55, 57	0.08	0.16	0.04	0.06
Neoplasms	**45 to 67**	**140 to 239**	**59 to 104**	**3.23**	**3.63**	**2.08**	**1.97**
Malignant neoplasms of the nose, mouth, pharynx and oesophagus	45, 46	140 to 150	59 to 62	0.12	0.43	0.03	0.03
Malignant neoplasm of stomach	47	151	63	1.12	0.42	0.52	0.16
Malignant neoplasms of intestine and of rectum	48 to 50	152 to 154	64 to 67	0.13	0.35	0.12	0.21
Other malignant neoplasms of digestive organs	51	155 to 159	68 to 72	0.30	0.29	0.18	0.12
Malignant neoplasm of respiratory organs	52 to 54	160 to 165	73 to 75	1.00	1.18	0.15	0.12
Malignant neoplasm of bones, cartilage and skin	55, 56	170 to 173	76 to 78	0.05	*0.08	0.03	*0.05
Malignant neoplasm of breast	57	174, 175	80	0.00	0.01	0.20	0.49
Malignant neoplasm of uterus	58, 59	179 to 182	81 to 83			0.42	0.25
Malignant neoplasms of other female genital organs	60	183, 184	84 to 86			0.16	0.17
Malignant neoplasm of prostate	61	185	87	0.03	0.11		
Malignant neoplasm of urinary organs	63	188, 189	89 to 91	0.13	0.24	0.03	0.05
Leukaemia and lymphomas	65, 66	200 to 208	99 to 103	0.17	0.16	0.11	0.11
Other malignant neoplasms	62 and 64	186, 187, 190 to 199	79, 88, 92 to 98	0.12	*0.34	0.08	*0.19
Benign and unspecified neoplasms	67	210 to 239	104	0.08	0.04	0.05	0.03
Diseases of the circulatory system	**84 to 102**	**390 to 459**	**133 to 156**	**3.76**	**9.79**	**2.30**	**3.33**
Rheumatic heart diseases	84, 85	390 to 398	133, 134	0.25	0.09	0.30	0.07
Hypertensive disease	86 to 89	401 to 405	135 to 138	0.15	0.04	0.08	0.01

(continued)

Table 12.4 (continued)

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Acute myocardial infarction	90, 91	410	139, 140	0.61	0.40	0.15	0.10
Atherosclerotic cardiosclerosis	92, 93	414.0	142	1.38	3.86	0.86	1.40
Other forms of ischaemic heart disease	94, 95	411 to 413, 414.1 to 414.9	141, 143	0.13	1.94	0.03	0.47
Other forms of heart disease	96, 97	415 to 429	144 to 146	0.08	1.29	0.06	0.30
Cerebrovascular disease	98, 99	430 to 438	147 to 151	1.01	1.85	0.71	0.87
Other diseases of circulatory system	100 to 102	440 to 459	152 to 156	0.15	0.33	0.10	0.10
Diseases of the respiratory system	**103 to 114**	**460 to 519**	**158 to 173**	**1.29**	**1.06**	**0.42**	**0.17**
Pneumonia 105 to 107	480 to 486	160 to 163	0.08	0.41	0.04	0.07	
Chronic bronchitis, emphysema, asthma, etc.	108, 109, 110	490 to 492	165 to 169	0.36	0.51	0.12	0.08
Empyema, abscess of lung and mediastinum	112	510, 513	172	0.06	0.10	0.02	0.02
Pulmonary congestion	113	514, 515	171	0.73	0.01	0.23	0.00
Other diseases of respiratory system	103, 104, 111 and 114	460 to 478, 487, 500 to 508, 511, 512, 516 to 519	158, 159, 164, 170, 173	0.06	0.02	0.02	0.00
Diseases of the digestive system	**115 to 127**	**520 to 579**	**175 to 189**	**0.51**	**1.85**	**0.20**	**0.68**
Ulcer of stomach and duodenum	115, 116	531 to 533	175 to 177	0.12	0.08	0.01	0.02
Diseases of intestines	118 to 121	540 to 543, 550 to 553, 555 to 558, 560	179 to 182	0.09	*0.02	0.03	*0.02
Cirrhosis of liver	122, 123	571.0 to 571.3, 571.5, 571.6	183, 184	0.16	1.36	0.08	0.52
Other diseases of liver and of biliary tract	124, 125	570, 571.4, 571.8 to 573, 575.2 to 576	185 to 187	0.03	0.10	0.03	0.04

Disease of pancreas	126	577	188	0.05	0.18	0.02	0.04
Other	117, 127	520 to 530, 534 to 537, 562 to 569, 578, 579	178, 189	0.04	*0.11	0.02	*0.04
Other diseases	**68 to 83, 128 to 157**	**240 to 389, 580 to 779**	**106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239**	**0.38**	**0.88**	**0.30**	**0.40**
Endocrine diseases	68 to 72	240 to 289	106 to 108, 110 to 113	0.05	0.11	0.06	0.10
Diseases of the nervous system and mental disorders	73 to 83	290 to 389	115 to 118, 120 to 128, 130, 131	0.15	0.58	0.10	0.16
Diseases of the genitourinary system *including*:	128 to 134	580 to 629	197 to 205	0.15	0.12	0.09	0.09
nephritis and glomerulonephritis	*128, 129*	*580 to 589*	*197 to 199*	*0.10*	*0.04*	*0.06*	*0.02*
infections of kidney	*130*	*590*	*200, 201*	*0.02*	*0.05*	*0.01*	*0.04*
hyperplasia of prostate	*133*	*600*	*204*	*0.01*	*0.01*		
other	*131, 132, 134*	*591 to 599, 601 to 629*	*202, 203, 205*	*0.02*	*0.03*	*0.02*	*0.02*
Other diseases	135 to 141, 142 to 157	630 to 676, 680 to 779	190, 192 to 195, 207 to 215, 217 to 226, 228 to 236, 239	0.03	0.08	0.04	0.07
Deaths from injury and poisoning	**160 to 176**	**800 to 999**	**242 to 258**	**1.55**	**4.03**	**0.35**	**0.74**
Transport accidents	160 to 162	800 to 848	242 to 248	0.19	0.41	0.04	0.09
Drowning and falls	166, 168	880 to 888, 910	249, 250	0.13	0.42	0.02	0.05
Accidental alcohol poisoning	163	850 to 869	252	0.14	**0.88	0.02	**0.20
Accidental poisoning by other substances	164	850 to 869		0.07	**0.29	0.03	**0.05
Accidents caused by fire, electric current or firearm	167, 170, 171	890 to 899, 922, 925	251	0.08	0.17	0.02	0.03

(continued)

Table 12.4 (continued)

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Suicide	173	950 to 959	253	0.44	0.56	0.12	0.08
Homicide	174	960 to 978	254	0.06	0.21	0.02	0.06
Death from injury undetermined whether accidentally or purposely inflicted	175	980 to 989	255	0.05	0.59	0.01	0.10
Other accidents	165, 169, 172, 176	870 to 879, 900 to 909, 911 to 921, 923, 924, 926 to 949, 990 to 999	256 to 258	0.38	0.74	0.07	0.13
Total for all causes	**1 to 176, 206**	**001 to 999**	**3 to 57, 59 to 104, 106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 133 to 156, 158 to 173, 175 to 189, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239, 242 to 258**	**11.79**	**22.24**	**5.91**	**7.45**

* These rates doubtful, as consistency could not be ensured in the transition from the previous Classification

** Given for 2004, since the last revision of the list produced no corresponding category in 2005 and 2006

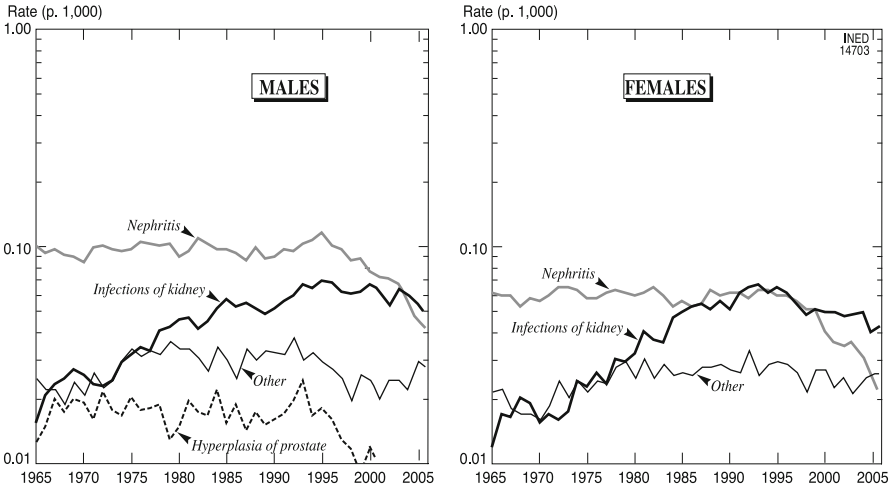

Fig. 12.35 Trends in standardized mortality rates for diseases of the genitourinary system, ages 40–64, since 1965

12.5 Causes of Death at 65 Years of Age and over

Even more than for adults aged 40–64, diseases of the circulatory system dominate mortality among people aged 65 and over, and this is equally the case for males and females (Fig. 12.36). On average, over the whole period 1965–2006, mortality from diseases of the circulatory system in males aged 65 and over was around eight times higher than mortality from cancer or mortality from diseases of the respiratory system – and nearly ten times higher in females.

Although this phenomenon is nothing new, it has tended to be accentuated by the increase in mortality from diseases of the circulatory system. However, the increase in this age group was much more modest than the increase we saw in the previous age group. It was also much less marked by the fluctuations in the 1980s and 1990s, since the main type of mortality among the old clearly appears to have been fairly insensitive to political and social events.

Two groups of causes that are close in size but show contrasting trends occupy second place in mortality among elderly people: diseases of the respiratory system and neoplasms. In the 1970s, diseases of the respiratory system were clearly in second place, before neoplasms (Fig. 12.36). However, deaths from respiratory disease have declined a great deal since then, especially among females, so that in recent years they have very largely ceded second place to mortality from cancer, which has remained relatively stable (increasing very slightly between 1965 and 2000 for males; stable for females).

In 1965, these two groups of conditions – each of which caused mortality one tenth that of mortality from diseases of the circulatory system – were followed by three other groups, also equal in size, each of which caused one tenth of the

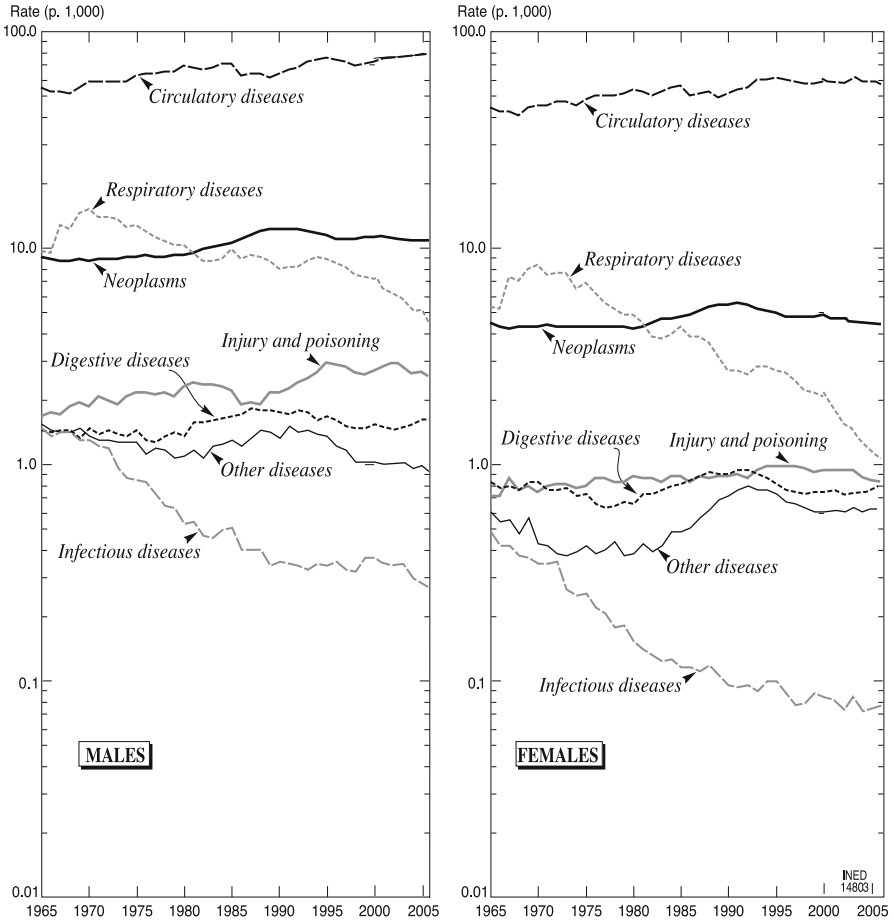

Fig. 12.36 Trends in standardized mortality rates by major groups of causes, age 65 and over, since 1965

mortality again (that is, equivalent to only 1% of the mortality resulting from diseases of the circulatory system): deaths from injury and poisoning, diseases of the digestive system and infectious diseases. Finally, all other causes form a fourth group of the same size. However, over just a few decades, these groups of causes followed divergent trends: deaths from injury and poisoning increased, diseases of the digestive system remained almost stable (as roughly did the group "other diseases") and infectious diseases declined strongly.

As before, here we shall examine the main components of each major group of causes, starting with the largest, diseases of the circulatory system (see Table 12.5 shown at the end of the Section 12.5).

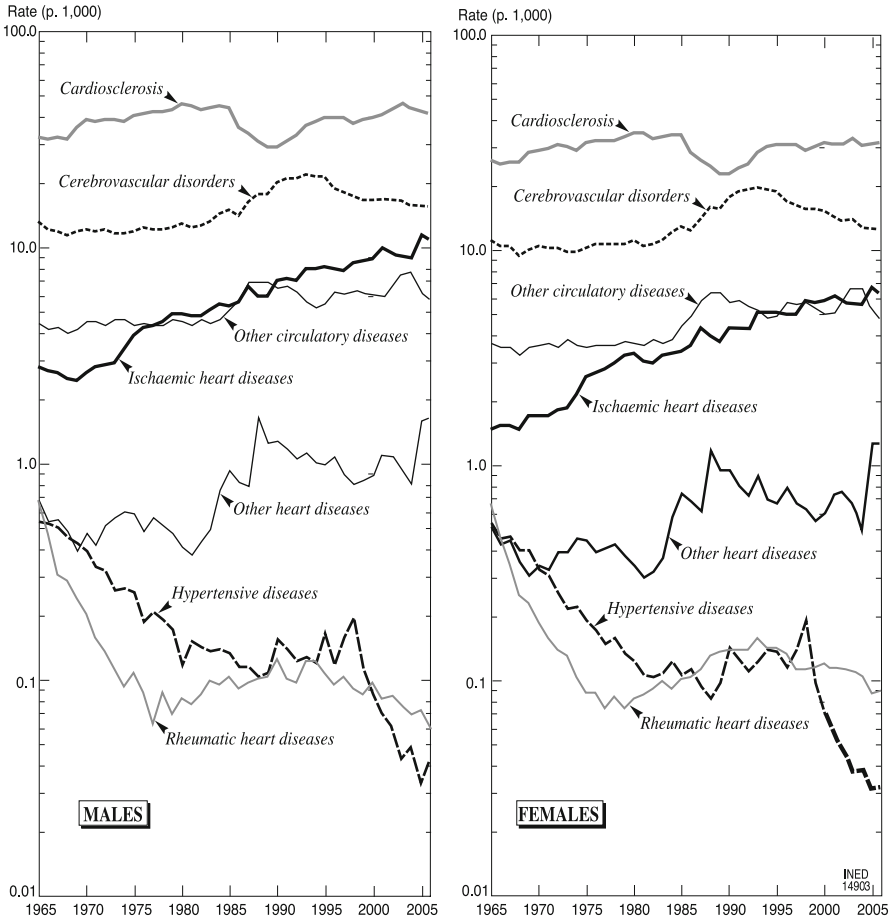

Fig. 12.37 Trends in standardized mortality rates for diseases of the circulatory system, age 65 and over, since 1965

12.5.1 Mortality from Diseases of the Circulatory System

Among people aged 65 and over, mortality from diseases of the circulatory system was, even more than in the preceding age group, dominated by cardiosclerosis. However, this reflects the fact that diagnosis becomes less precise as people age, rather than any real difference in the disease pattern. As in the 40–64 age group, trends in mortality from cardiosclerosis were quite sensitive to trends in alcohol consumption (Fig. 12.37), but in contrast, the economic and social crisis of the 1990s had hardly any influence on them.

Conversely, mortality from cerebrovascular disease, which had remained stable at this age until the mid-1980s, did not decline at all with the anti-alcohol campaign, but increased noticeably at the turn of the 1990s.

In the light of our explanation in relation to the previous age group, Fig. 12.37 shows acute myocardial infarction grouped with other forms of ischaemic heart disease; however, mortality from this group of conditions is in only third position here, much further behind mortality from cerebrovascular disease than mortality from other ischaemic heart diseases alone was in the previous age group (Fig. 12.20). In fact, any attempt to use the Soviet Classification to evaluate the true impact of ischaemic heart disease and its trends seems even more futile here than in all the other age groups, since mortality from cardiosclerosis creates such a strong bias in the available data on myocardial infarction or other forms of ischaemic heart disease.

Mortality from rheumatic heart diseases is obviously very small (in relative values) at this age. Trends in this mortality differ from those we observed in the earlier age groups. Whereas we observed a very rapid fall in this type of mortality among young adults over the whole period, the reduction in the 40–64 age group was, in contrast, very slow. At ages 65 and over, from the late 1970s onwards, the fall gave way to an increase: this may simply have been a matter of improved diagnosis of heart valve conditions.

"Other diseases of the circulatory system" occupied a relatively significant place in this age group, and so the contents of this category merit a little more investigation. In reality, it was a rag-bag of conditions, entirely dominated by diseases of arteries, arterioles and capillaries. For the most part, deaths classified under this item were from atherosclerosis, whose progression with age is well-known.

12.5.2 Diseases of the Respiratory System and Infectious Diseases

Behind diseases of the circulatory system, two groups of conditions vie for second place in mortality at ages 65 and over: diseases of the respiratory system and cancers. At the start of the period, it was diseases of the respiratory system that were in the lead, though since the early 1980s it has been cancer. Therefore we shall begin by talking here about diseases of the respiratory system, while also considering infectious diseases, with which they have numerous points in common.

As in the previous age group, this category is dominated by the interaction of pulmonary congestion and chronic bronchitis, with the first occupying the foreground at the outset but declining steeply in the 1980s and 1990s, while mortality from bronchitis maintained its level (and even increased among males) during the 1980s (Fig. 12.38).

Far below these conditions, we find pneumonia, asthma and "other diseases of the respiratory system", all fairly close together. Trends in these have followed a somewhat downward path over the whole period, especially among females. In the previous age group, mortality from pneumonia was observed to be very sensitive to both alcohol consumption and the economic and social crisis of the 1990s. Among elderly people, however, it responded very little, though a slight fall, especially among males, can be observed at the time of the anti-alcohol campaign. The abrupt rise in

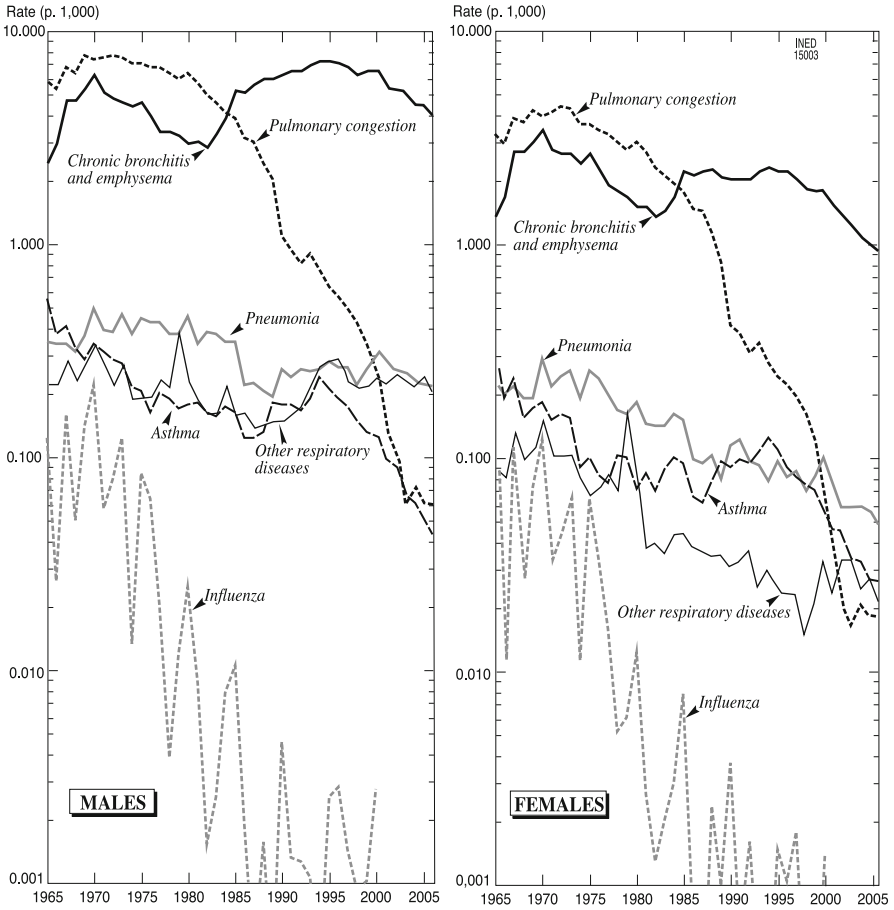

Fig. 12.38 Trends in standardized mortality rates for respiratory diseases, age 65 and over, since 1965

mortality from "other diseases of the respiratory system" observed in females in 1999 is certainly a construct linked to a change in coding practice, and a symmetrical effect is found on the curve for pulmonary congestion. This phenomenon is less visible among males, where "other diseases of the respiratory system" has different components.

Influenza, which at the start of the period occupied a fairly significant position in this age group, clearly demonstrates in Fig. 12.38 the strong fluctuations linked to its epidemic nature, before disappearing almost entirely from the picture at the end of the period. As everywhere in the world, this near-disappearance is closely linked to the widespread use of polyvalent vaccines from the 1970s onwards.

As in the previous age group, the infectious diseases category is very largely dominated by tuberculosis, which, at this age again, occupies a significant position in mortality in Ukraine (Fig. 12.39). In contrast, and in the reverse of the situation

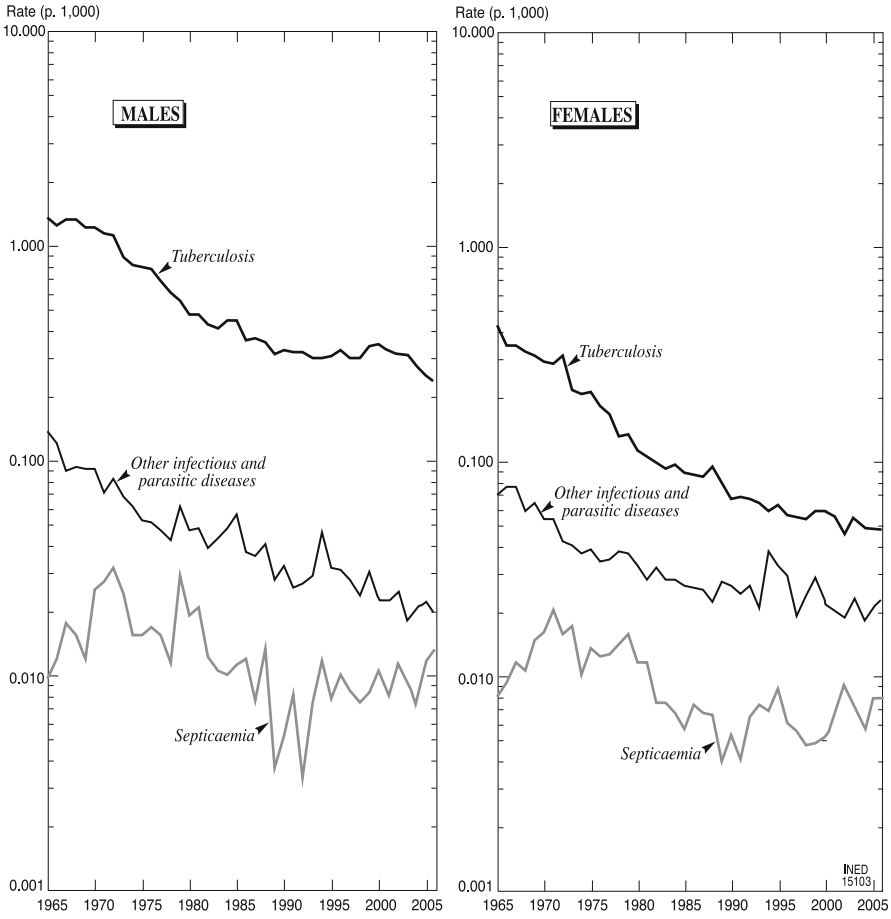

Fig. 12.39 Trends in standardized mortality rates for infectious diseases, age 65 and over, since 1965

at 40–64 years of age, the fall in mortality from tuberculosis was not followed by a fresh upsurge from the end of the 1980s onwards. It merely came to a halt in males and slowed down in females. As for pneumonia, here we see that the economic and social crisis in the 1990s did not have the impact on mortality among elderly people that one might imagine.

12.5.3 Cancers

Once again, here we can see that the great stability in mortality from cancers (compared to the other major groups of causes, Fig. 12.36) resulted from a combination of contrasting trends in different forms of cancer (Figs. 12.40 and 12.41).

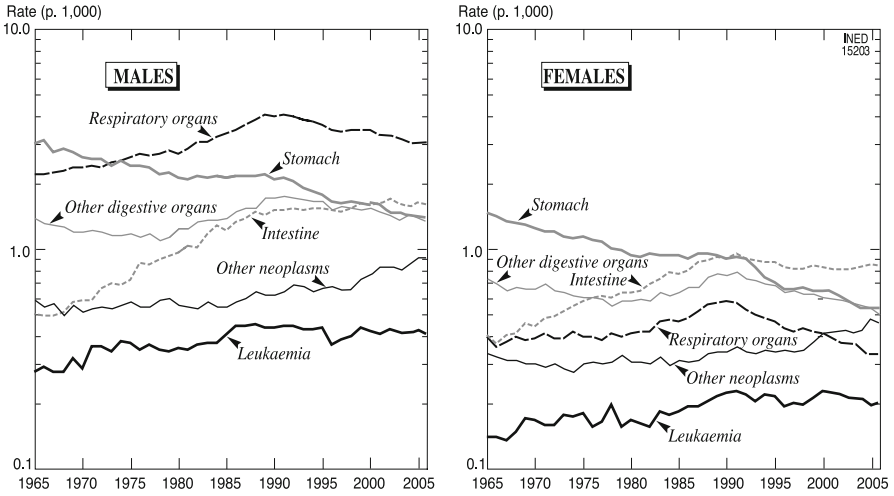

Fig. 12.40 Trends in standardized mortality rates for cancer (excluding breast and genitourinary cancers), age 65 and over, since 1965

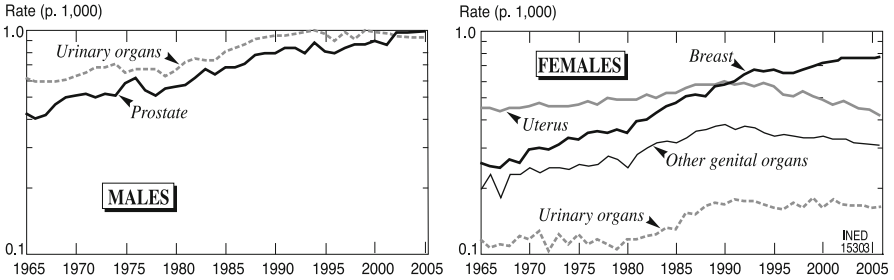

Fig. 12.41 Trends in standardized mortality rates for breast and genitourinary cancers, age 65 and over, since 1965

Firstly, at least among males, a fall in mortality from stomach cancer contrasted with rises in respiratory cancers and cancers of the intestine. Among females, since mortality from cancer of the respiratory organs took more of a downward turn than for males, the contrast is especially between stomach cancer and intestinal cancer. Since 1990 for females and 2000 for males, mortality from cancer of the intestine has exceeded mortality from stomach cancer. These two are the most notable digestive cancers: lying somewhere between them, all other cancers of the digestive organs have changed much less, but have tended to decline in recent decades; in the end, for both sexes, they have followed a trajectory very close to that of stomach cancers.

Since the early 1990s, there has also been a fall in mortality from respiratory cancer in this age group, even as the fall in mortality from stomach cancer has accelerated markedly, notably among females. In regard to the decline in mortality from respiratory cancers in the previous age group, we have already mentioned the

reduction in risks linked to industrial pollution and to tobacco consumption, as the country's industrial fabric decayed and cigarette prices rose. We have also mentioned the effect of competition between cancer and the soaring mortality from other causes due to the crisis (Shkolnikov et al. 1999). This second explanation may come more to the fore here, if we take the view that lung cancer and stomach cancer had the greatest effect on the socially disadvantaged populations that were vulnerable to the crisis.

As in the 40–64 age group, mortality from prostate cancer among males aged 65 and above increased over the whole period. Mortality from cancer of the urinary organs also constantly increased until the mid-1990s, when it seems to have hit a ceiling. Nowadays, prostate cancer causes more deaths among males than all other genitourinary cancers (Fig. 12.41).

The strong contrast observed in the 40–64 age group between breast cancer and cancer of the uterus is found again in females aged 65 and over, albeit in a slightly different form. On the one hand, although mortality from breast cancer clearly increased between 1965 and 1990, it then stagnated somewhat; on the other hand, mortality from cancer of the uterus really only declined from the early 1990s, and before then it had even increased slightly. The divergence has always been and remains marked, even though the two trajectories crossed in the early 1990s. In 1965, mortality from cancer of the uterus was almost double mortality from breast cancer. In 2006, the reverse was true.

12.5.4 Deaths from Injury and Poisoning

After diseases of the respiratory system and cancers, two other major groups of conditions vie for fourth place in mortality: deaths from injury and poisoning and diseases of the digestive system (Fig. 12.36).

In order to facilitate comparison with the previous age group, in Fig. 12.42 we have represented the same groups of causes in the same way as those in Fig. 12.26.

Among the groups of causes identified in the 40–64 age group as being the most sensitive to both alcohol consumption trends and the economic and social crisis, the only one found here, at age 65 and over, that might really match this twofold criterion is the category of injuries where it cannot be determined whether they have been accidentally or purposely inflicted. Alcohol poisoning and homicide are still very closely linked to alcohol consumption, at least among males, but in this age group they appear to have been much less sensitive to the crisis in the 1990s. Homicide of females even appears to have been insensitive to changes in alcohol consumption. As for "other accidents", they were not strongly influenced by either alcohol consumption or the crisis.

The same goes for all the other groups of deaths from injury and poisoning shown in the second part of Fig. 12.42, with the exception of transport accidents, a category that was marked by the anti-alcohol campaign. In particular, it is astonishing that suicide, which is in fact by far the major external cause of death from injury and poisoning in males aged 65 and over, appears to be so insensitive to alcohol consumption.

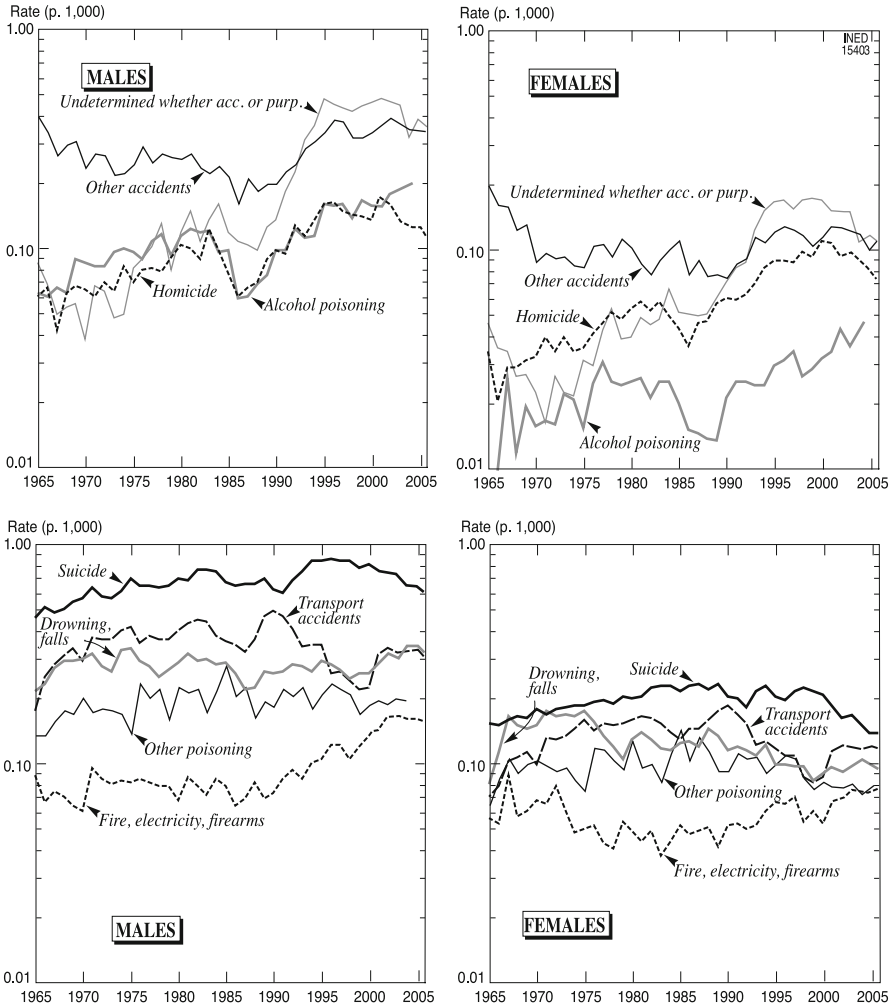

Fig. 12.42 Trends in standardized mortality rates: deaths from injury and poisoning, age 65 and over, since 1965

Finally, we should note that, at this age, the category "drowning and falls", which, in the earlier age groups, was largely dominated by drowning, is here divided equally between its two components and what is more, both show very monotonous trends.

12.5.5 Diseases of the Digestive System

Cirrhosis of the liver, while it remains the primary digestive cause of death in males, dominates this category much less than in the previous age group (Fig. 12.43). It has

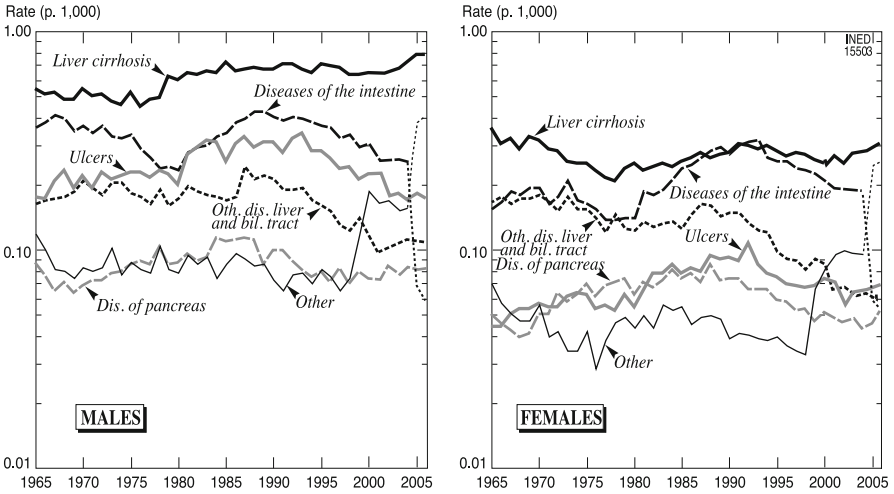

Fig. 12.43 Trends in standardized mortality rates for diseases of the digestive system, age 65 and over, since 1965

also followed very different trends: mortality from this cause has been relatively stagnant, as well as totally insensitive to trends in alcohol consumption, in total contradiction to the trends shown in Fig. 12.30.

On the other hand, diseases of the intestines were more important in elderly people, reaching second place for males and even drawing equal with cirrhosis of the liver for females.

As in the 40–64 age group, stomach ulcers occupied a significant position among males, and mortality from this cause has tended to increase for both sexes. However, at this age we do not find the male sensitivity to the crisis in the 1990s that we observed in the 40–64 age group.

12.5.6 Other Diseases

As in the previous age group, of all the "other diseases", only diseases of the genitourinary system, diseases of the nervous system and endocrine diseases played any significant role in mortality among the elderly (Fig. 12.44). Diseases of the genitourinary system were largely dominant among males up to the early 1990s, before declining strongly to the point where, at the end of the period, they were almost level with the other two groups. Among females, mortality rates from these three groups of conditions were situated fairly close together over the whole period.

Among genitourinary diseases, as one might imagine, hyperplasia of the prostate was dominant among males, at least up to the mid-1990s (Fig. 12.45). From then on, mortality from this condition started to decline steeply, to the point where it has now

Table 12.5 Causes of death at age 65 and over: groups of items used (with corresponding ICD-9 items) and trends in mortality rate between 1965 and 2006

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Infectious and parasitic diseases	**1 to 44, 206**	**001 to 139**	**3 to 57**	**1.49**	**0.27**	**0.49**	**0.08**
Tuberculosis	9 to 13, 43	010 to 018, 137	11 to 17, 56	1.34	0.24	0.42	0.04
Septicaemia	25	038	29	0.01	0.01	0.01	0.01
Other infectious and parasitic diseases	1 to 8, 14 to 24, 26 to 42, 44, 206	001 to 009, 020 to 037, 039 to 138, 139	3 to 10, 18 to 28, 30 to 55, 57	0.14	0.02	0.07	0.02
Neoplasms	**45 to 67**	**140 to 239**	**59 to 104**	**8.91**	**11.48**	**4.46**	**4.40**
Malignant neoplasm of stomach	47	151	63	2.99	1.35	1.44	0.53
Malignant neoplasms of intestine and of rectum	48 to 50	152 to 154	64 to 67	0.50	1.57	0.40	0.81
Other malignant neoplasms of digestive organs	45, 46, 51	140 to 150, 155 to 159	68 to 72	1.39	1.30	0.73	0.49
Malignant neoplasm of respiratory organs	52 to 54	160 to 165	73 to 75	2.15	2.98	0.39	0.32
Malignant neoplasm of breast	57	174, 175	80	0.01	0.02	0.25	0.74
Malignant neoplasm of uterus	58, 59	179 to 182	81 to 83			0.45	0.40
Malignant neoplasms of other female genital organs	60	183, 184	84 to 86			0.20	0.30
Malignant neoplasm of prostate	61	185	87	0.42	1.05		
Malignant neoplasm of urinary organs	63	188, 189	89 to 91	0.61	0.91	0.12	0.16
Leukaemia and lymphomas	65, 66	200 to 208	99 to 103	0.27	0.41	0.14	0.20
Other neoplasms	55, 56, 62, 64, 67	170 to 173, 186, 187, 190 to 199, 210 to 239	59 to 62, 76 to 79, 92 to 98, 104	0.59	0.89	0.34	0.45

(continued)

Table 12.5 (continued)

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Diseases of the circulatory system	**84 to 102**	**390 to 459**	**133 to 156**	**53.87**	**75.15**	**43.75**	**56.65**
Rheumatic heart diseases	84, 85	390 to 398	133, 134	0.67	0.06	0.66	0.09
Hypertensive disease	86 to 89	401 to 405	135 to 138	0.54	0.04	0.54	0.03
Atherosclerotic cardiosclerosis	92, 93	414.0	139, 140	31.73	41.75	25.89	31.33
Other forms of ischaemic heart disease	90, 91, 94, 95	410 to 413, 414.1 to 414.9	142	2.76	10.72	1.43	6.38
Other forms of heart disease	96, 97	415 to 429	141, 143	0.67	*1.60	0.52	*1.21
Cerebrovascular disease	98, 99	430 to 438	144 to 146	13.00	15.32	11.01	12.69
Other diseases of circulatory system	86 to 89, 100 to 102	440 to 459	147 to 151	4.50	5.66	3.69	4.92
Diseases of the respiratory system	**103 to 114**	**460 to 519**	**158 to 173**	**9.54**	**4.38**	**5.29**	**1.03**
Influenza	104	487	159	0.12	0.00	0.09	0.00
Pneumonia	105 to 107	480 to 486	160 to 163	0.35	0.21	0.22	0.05
Chronic bronchitis and emphysema	108, 110	490 to 492	165 to 166, 168, 169	2.44	3.88	1.34	0.91
Asthma	109	493	167	0.55	0.04	0.27	0.03
Pulmonary congestion	113	514, 515	171	5.82	0.06	3.25	0.02
Other diseases of respiratory system	103, 111, 112 and 114	460 to 478, 500 to 508, 510 to 513, 516 to 519	158, 164, 170, 172, 173	0.27	0.19	0.12	0.02
Diseases of the digestive system	**115 to 127**	**520 to 579**	**175 to 189**	**1.44**	**1.60**	**0.84**	**0.79**
Ulcer of stomach and duodenum	115, 116	531 to 533	175 to 177	0.17	0.17	0.04	0.07
Diseases of intestines	118 to 121	540 to 543, 550 to 553, 555 to 558, 560	179 to 182	0.36	*0.05	0.15	*0.05
Cirrhosis of liver	122, 123	571.0 to 571.3, 571.5, 571.6	183, 184	0.54	0.78	0.36	0.30

Other diseases of liver and of biliary tract	124, 125	570, 571.4, 571.8 to 573, 575.2 to 576	185 to 187	0.16	0.10	0.17	0.06
Diseases of pancreas	126	577	188	0.09	0.08	0.05	0.05
Other	117, 127	520 to 530, 534 to 537, 562 to 562 to 569, 578, 579 569, 578, 579	178, 189	0.12	*0.41	0.07	*0.25
Other diseases	**68 to 83, 128 to 157**	**240 to 389, 580 to 779**	**106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 190, 192 to 195, 197 to 205, 207 to 215, 217 to 226, 228 to 236, 239**	**1.55**	**0.90**	**0.61**	**0.60**
Endocrine diseases	68 to 72	240 to 289	106 to 108, 110 to 113	0.11	0.18	0.13	0.20
Diseases of the nervous system and mental disorders	73 to 83	290 to 389	115 to 118, 120 to 128, 130, 131	0.42	0.31	0.28	0.18
Diseases of the genitourinary system including:	128 to 134	580 to 629	197 to 205	0.94	0.36	0.14	0.15
nephritis and glomerulonephritis	*128, 129*	*580 to 589*	*197 to 199*	*0.17*	*0.02*	*0.09*	*0.02*
infections of kidney	*130*	*590*	*200, 201*	*0.08*	*0.16*	*0.02*	*0.10*
hyperplasia of prostate	*133*	*600*	*204*	*0.57*	*0.11*		
other	*131, 132, 134*	*591 to 599, 601 to 629*	*202, 203, 205*	*0.13*	*0.07*	*0.02*	*0.04*
Other diseases	135 to 141, 142 to 157	630 to 676, 680 to 779	190, 192 to 195, 207 to 215, 217 to 226, 228 to 236, 239	0.08	0.06	0.06	0.07
Deaths from injury and poisoning	**160 to 176**	**800 to 999**	**242 to 258**	**1.66**	**2.47**	**0.70**	**0.80**
Transport accidents	160 to 162	800 to 848	242 to 248	0.17	0.31	0.07	0.12
Drowning and falls	166, 168	880 to 888, 910	249, 250	0.21	0.31	0.08	0.09
Accidental alcohol poisoning	163	850 to 869	252	0.06	**0.19	0.01	**0.04

(continued)

Table 12.5 (continued)

Groups used	1995 Soviet Classification	ICD (9th Revision)	2005 Ukrainian Classification	Rate per 1000			
				Male		Female	
				1965	2006	1965	2006
Accidental poisoning by other substances	164	850 to 869		0.13	**0.19	0.06	**0.07
Accidents caused by fire, electric current or firearm	167, 170, 171	890 to 899, 922, 925	251	0.09	0.15	0.06	0.08
Suicide	173	950 to 959	253	0.46	0.59	0.15	0.14
Homicide	174	960 to 978	254	0.06	0.11	0.03	0.07
Death from injury undetermined whether accidentally or purposely inflicted	175	980 to 989	255	0.09	0.35	0.05	0.11
Other accidents	165, 169, 172, 176	870 to 879, 900 to 909, 911 to 921, 923, 924, 926 to 949, 990 to 999	256 to 258	0.40	0.33	0.20	0.11
Total for all causes	**1 to 176, 206**	**001 to 999**	**3 to 57, 59 to 104, 106 to 108, 110 to 113, 115 to 118, 120 to 128, 130, 131, 133 to 156, 158 to 173, 175 to 189, 190, 192 to 195, 197, to 205, 207 to 215, 217 to 226, 228 to 236, 239, 242 to 258**	**78.47**	**95.24**	**56.14**	**64.35**

* These rates doubtful, as consistency could not be ensured in the transition from the previous Classification

** Given for 2004, since the last revision of the list produced no corresponding category in 2005 and 2006

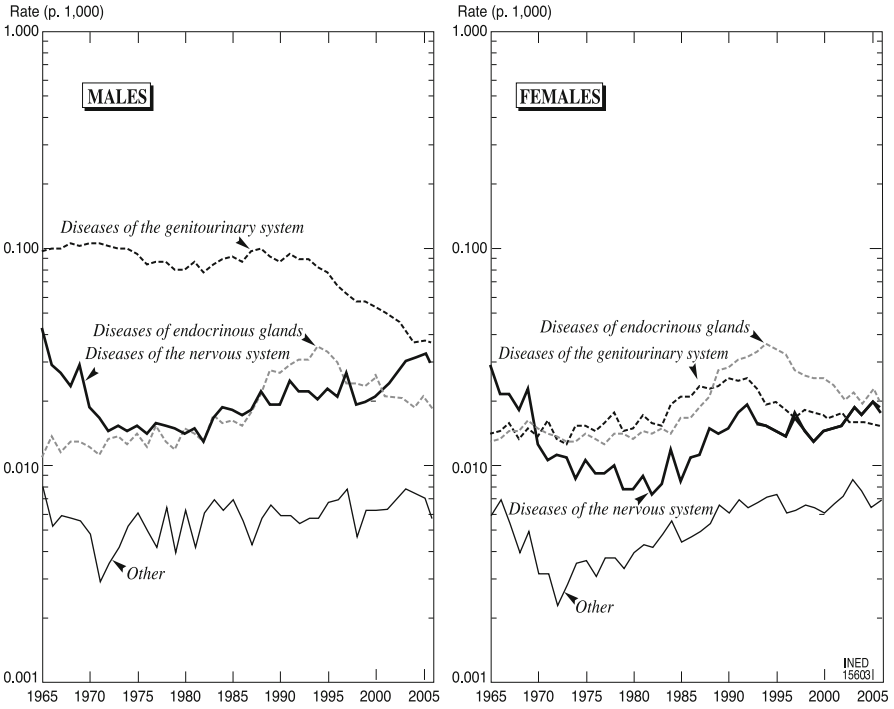

Fig. 12.44 Trends in standardized mortality rates for other diseases, age 65 and over, since 1965

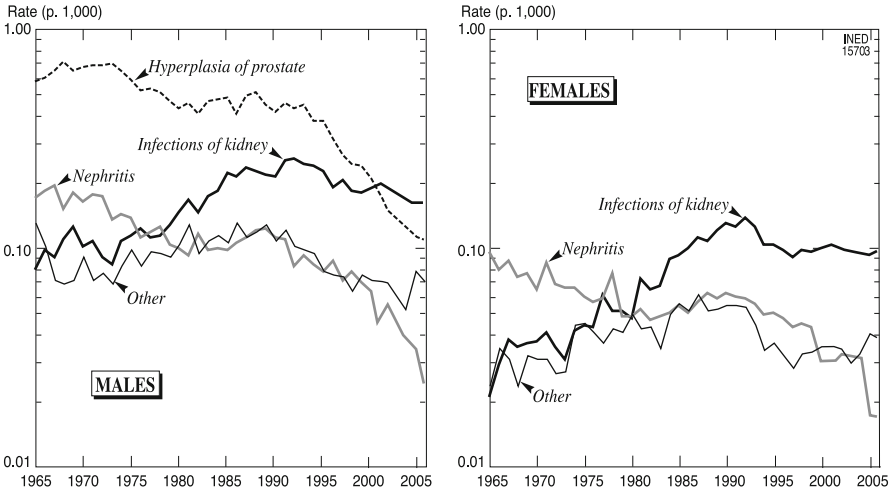

Fig. 12.45 Trends in standardized mortality rates for diseases of the genitourinary system, age 65 and over, since 1965

been overtaken by kidney infections, which increased a great deal until the mid-1990s. Among females, mortality from kidney infections, which also increased greatly over the same period, is nowadays by far the largest component of this group.

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