

Fourty years of evolution of mortality in Belgium and The Netherlands¹

by

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Abstract

Age adjusted mortality in Belgium (B) and The Netherlands (NL) was calculated from 5 yearly age-specific death rates between the ages 45-74 and 75-85+ years. Mortality was available in Belgium from 1954 to 1991 or 1994 (depending on the cause of death) and from 1950 to 1993 in The Netherlands. In the 45-74 years age class all-cause mortality decreased in B between 1955 and 1992 with 33% in men and 48% in women. In NL this was 11% and 40%, respectively. In the age class 75-85+ it was 21% and 37% in B, and 4% and 36% in NL, respectively. Since 1980 to the last available year there was a marked decrease in mortality in the age class 75-85+ years in men and women from B and no change in NL. Wallonia always had the highest mortality, followed by B, Flanders and NL. However, recently the observed mortality in Flanders was the lowest.

Mortality trends, in both age classes and sexes, were obtained between 1980 to the last available year for 11 causes of death in men and 13 in women.

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Among 48 possible comparisons, 38 (79%) were in favour of B, 9 in favour of NL and 1 *ex aequo*.

Life expectancy in 1992 was compared in the 15 E.U. countries. For both sexes together B ranked 8th, NL 3rd. The difference in life expectancy between the two countries was 3 years in 1967 and 1 year in 1992. Flanders ranked 5th (0.3 year lower than NL) and Wallonia 14th (2.2 years lower) when substituted for B in the E.U. Portugal had the best and Denmark had the worst results between 1967 and 1992).

Changes in life style—fat, salt, fruit and vegetable intake and smoking habits—which occurred since 1960 in B, its regions and in NL are consistent with the changes in mortality and life expectancy. Curative medicine and medical technology cannot explain the observed differences and trends.

Key-words

Mortality, life expectancy, fat intake, salt intake, smoking habits.

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Since more than 90 years total mortality has always been higher in Belgium than in The Netherlands. For more than 50 years mortality has been, and still is, higher in Wallonia than in Flanders. To analyze those observations and to try to pinpoint the underlying causes are the main goals of this paper.

1. Methods

In Belgium all-cause mortality in five yearly age classes to age 84 and the 85+ age class was available through a tape from the World Health Organisation (W.H.O.), Geneva, for the years 1954 to 1989. For the years 1990 to 1994 data came from the National Institute for Statistics (N.I.S.), using data from the state demographic registry for the years 1992-94. More specific causes of deaths in Belgium, from death certificates, are only available from 1954 to 1989 from W.H.O. and 1990-91 from N.I.S. (1).

In The Netherlands all data were available from W.H.O. between 1950 and 1993. For Flanders and Wallonia the all-cause mortality was

available through the N.I.S. between 1971 and 1994 and between 1971 and 1991 for cause-specific mortality.

Sex- and age adjusted mortality were calculated between ages 45 and 74 years and between 75 and 85+ years, using the old European Standard Population of Doll et al. (3). The yearly change in mortality was calculated by using linear regression in Belgium between 1980-91 (1980-94 for all-cause mortality and its regions) and between 1980-93 for The Netherlands.

Percent change of all-cause mortality in Belgium and The Netherlands compared with 20 other countries was calculated with the formula $(\%92-'55) * 100 / '55$ with the mean of three years between 1954-56 and 1991-93 ('91 in Italy) and for men, women and the average of both sexes. All statistical values with a $p > 0.05$ were considered as not significant. Life expectancy data were obtained from W.H.O. (2) and for the mean of 1991-93 and the regional data, including Brussels and the provinces in Belgium from the N.I.S.

Cardiovascular mortality data are only given after 1970, since, especially in Belgium, they were less reliable before that time.

Mortality data of Brussels are not given because of greater random variation (small population) and since they are generally similar to those of Belgium.

Data on nutrients and foods are given by references 4 to 13.

2. Results

2.1 All-cause mortality, 1950-94

The 45-74 year age adjusted all-cause mortality in men from Belgium, The Netherlands, Flanders and Wallonia provided a complex picture (Fig. 1). All-cause mortality increased in Belgium and The Netherlands up to 1970, but more so in The Netherlands, thereby gradually decreasing the difference between both countries. Mortality decreased after 1970, but faster in Belgium and its regions. After 1987 onwards overall mortality in Flanders was lower than in The Netherlands.

In women (Fig. 2) a totally different picture emerged. Mortality decreased faster in The Netherlands up to 1970, thereby increasing the gap. After 1970 all-cause mortality decreased faster in Belgium

All – cause mortality
Men, age – adjusted 45 – 74 y per thousand
5 yearly smoothed

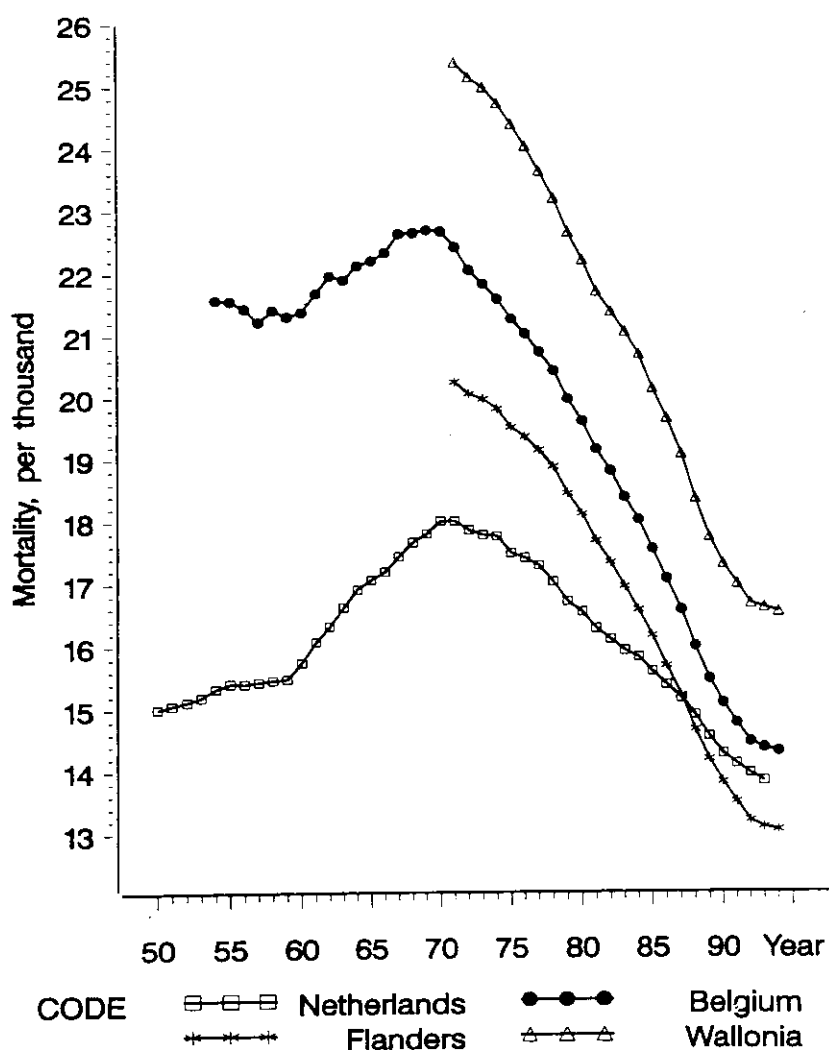


Fig. 1

and its regions. After 1989 it was lowest in Flanders and nearly identical mortality values were observed in Belgium and The Netherlands.

The opposite behaviour of mortality in both sexes between 1950 and 1970 resulted in a different picture for the average of men and women (Fig. 3). Mortality remained nearly unchanged between 1954 and 1970 with only a small dip around 1959. This dip was seen also in other countries as Finland, Hungary and Denmark (also in England

All-cause mortality
Women, age-adjusted 45-74 y per thousand
5 yearly smoothed

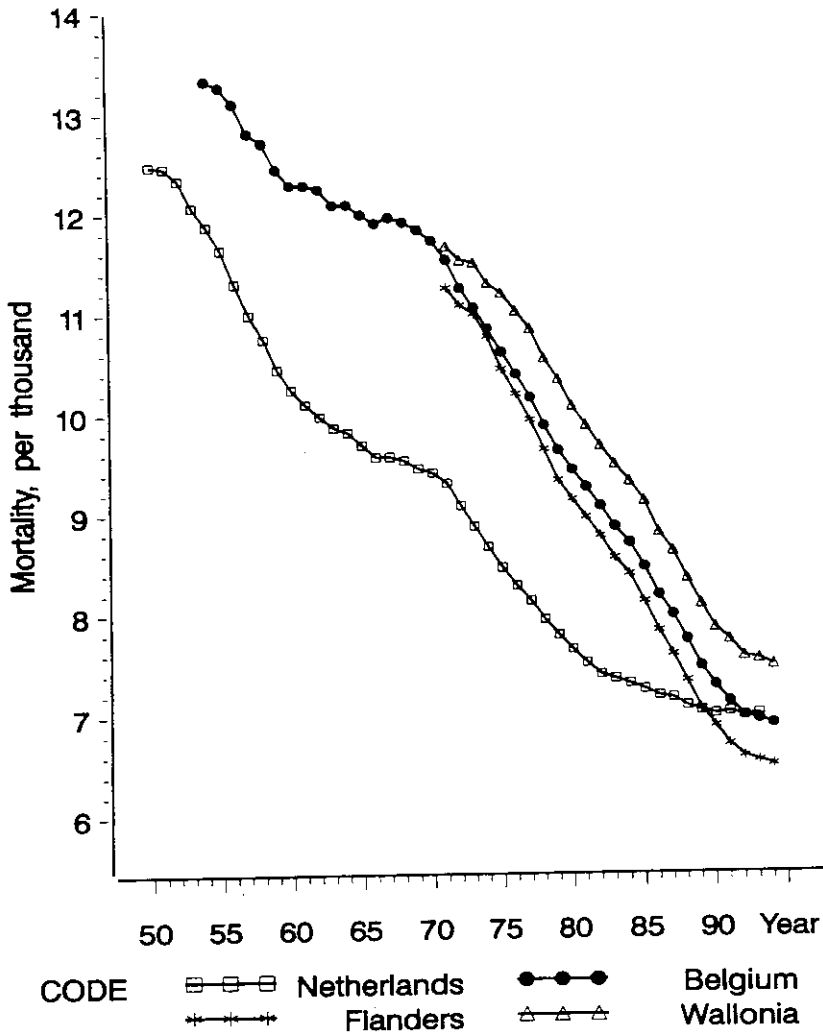


Fig. 2

and Wales and the U.S., not shown). This phenomenon could be due to climatic influences. The fifties were much warmer than the sixties.

After 1970 mortality decreased faster in Belgium and its regions than in The Netherlands. The strongest decrease was seen in Japan; Finland showed also an important decrease (Fig. 3). Mortality decreased only by a small amount in Denmark and increased in Hungary since 1965.

All-cause mortality
(M + F)/2, age-adjusted 45-74 y per thousand
5 yearly smoothed

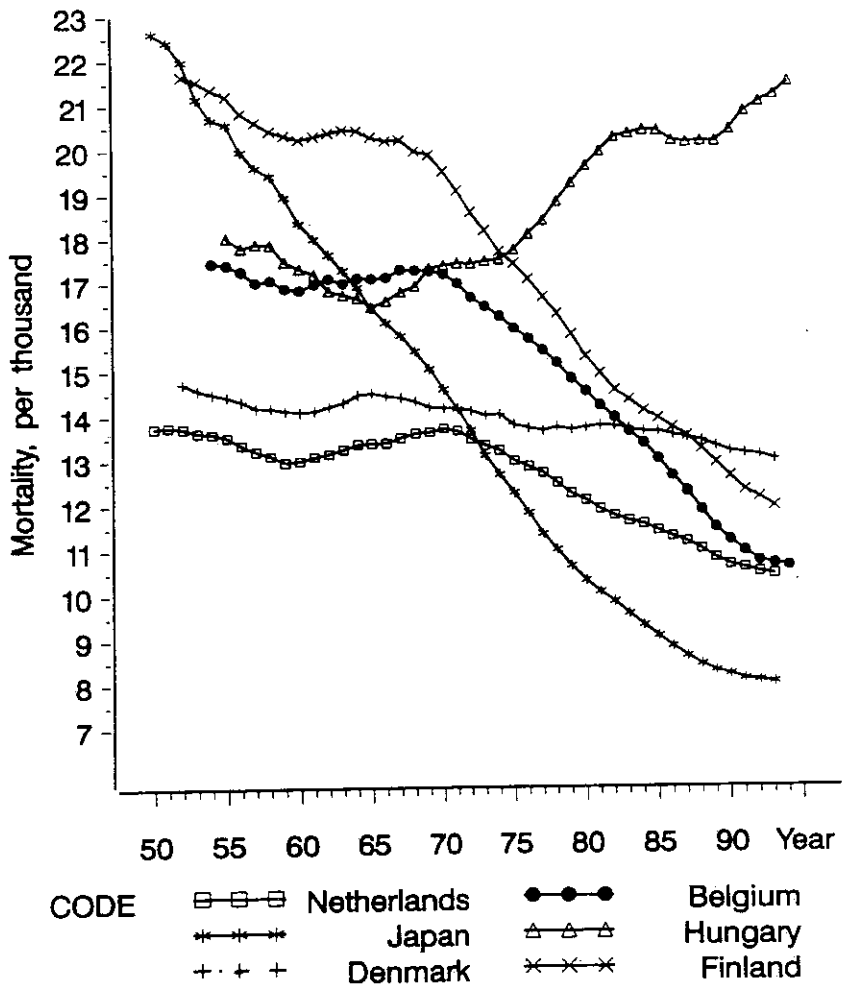


Fig. 3

The 75-85+ year age class behaved differently, especially in men (Fig. 4). A very high all-cause mortality in Belgium and a much lower one in The Netherlands are slightly decreasing up to 1970. After 1970 the mortality in men from Belgium and its regions is decreasing much faster than in The Netherlands. After 1980 there is even a not significant increase in The Netherlands. In women in the fifties (Fig. 5) there is only a small difference in mortality between Belgium and The Netherlands gradually increasing up to the beginning of the eighties. After 1980 there is no significant change in mortality in The Netherlands, whereas mortality in Belgium is continuing to decrease strongly

All – cause mortality
Men, age – adjusted 75 – 85+ y per thousand
5 yearly smoothed

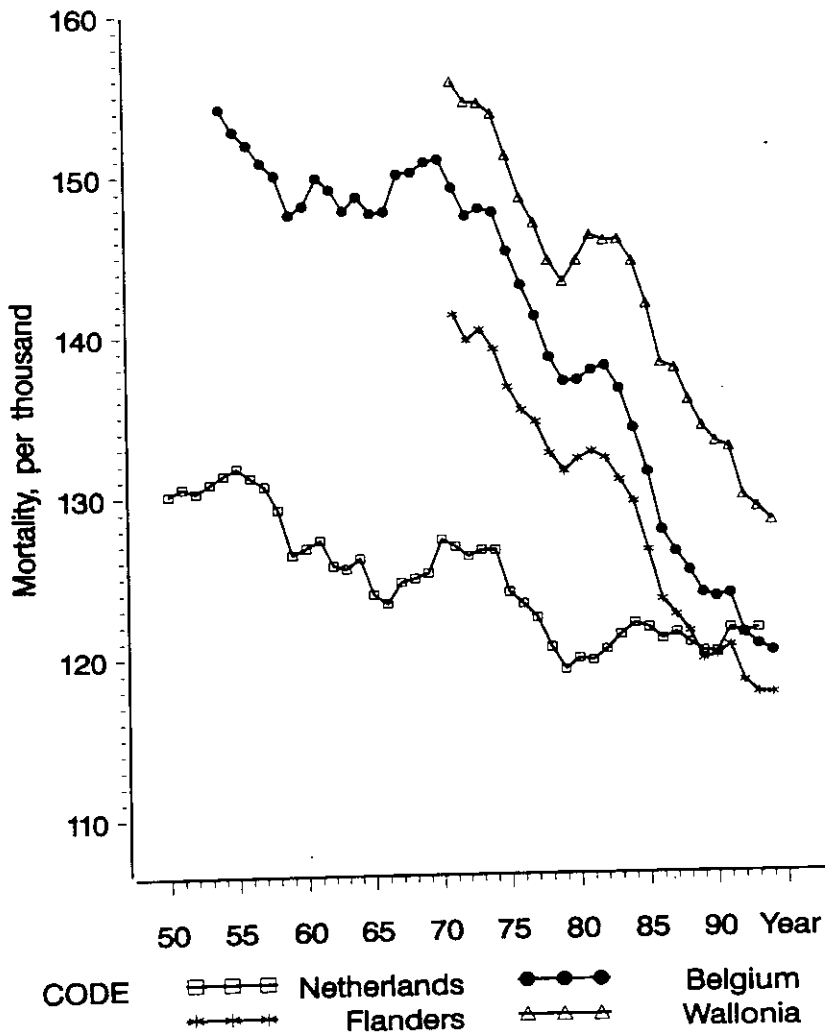


Fig. 4

up to 1990, flattening out after that date. Mortality in Flanders is lower than in The Netherlands in men since 1989 and remained slightly higher in women (Figs. 4 and 5).

For the average of both sexes in the 75-85+ year age class (Fig. 6), mortality is decreasing in Belgium and The Netherlands from the start of the W.H.O. mortality statistics, 1954 and 1950, respectively. All six countries shows a decrease but smallest in The Netherlands, Denmark and Hungary and highest in Japan.

All – cause mortality
Women, age – adjusted 75 – 85 + y per thousand
5 yearly smoothed

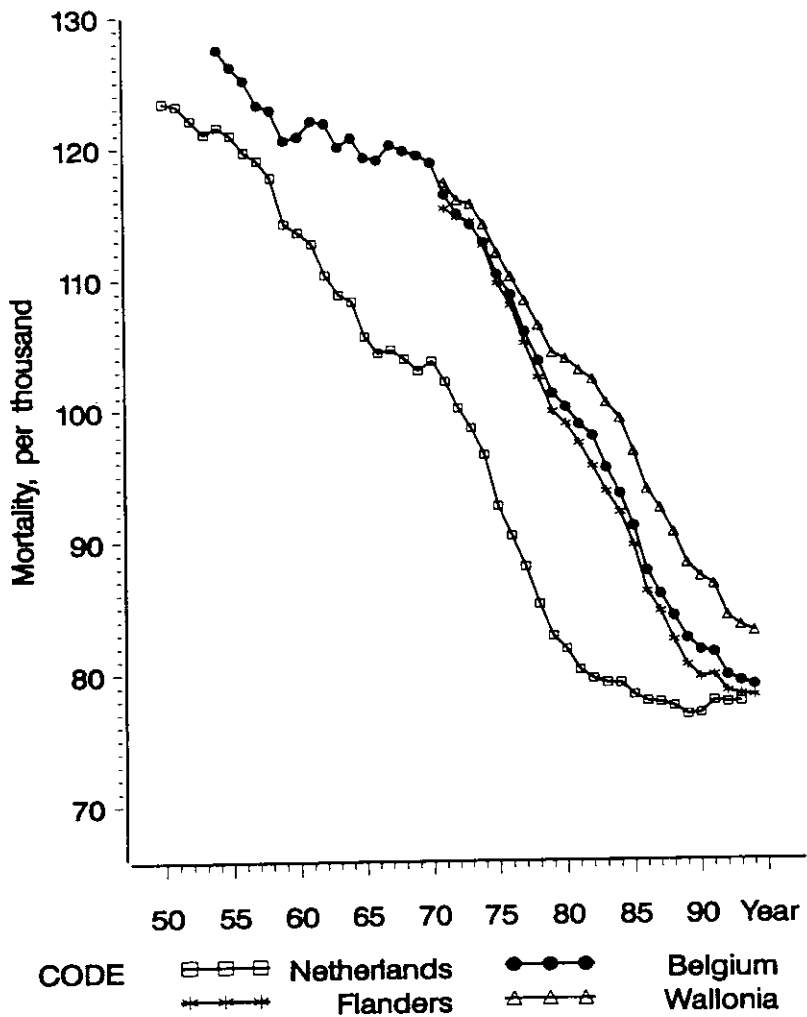


Fig. 5

In both age classes all-cause mortality (Figs. 1, 2 and 4, 5) is always higher in Wallonia than in Belgium, Flanders and The Netherlands. In men the decrease is faster in Wallonia (Figs. 1 and 4).

2.2 Per cent changes in mortality 1955 to 1992

Among 21 countries and for the average of both sexes Belgium ranked 7th in the 45-74 year age class and 11th in the 75-85+ group

All – cause mortality
 (M + F)/2, age – adjusted 75 – 85 + y per thousand
 5 yearly smoothed

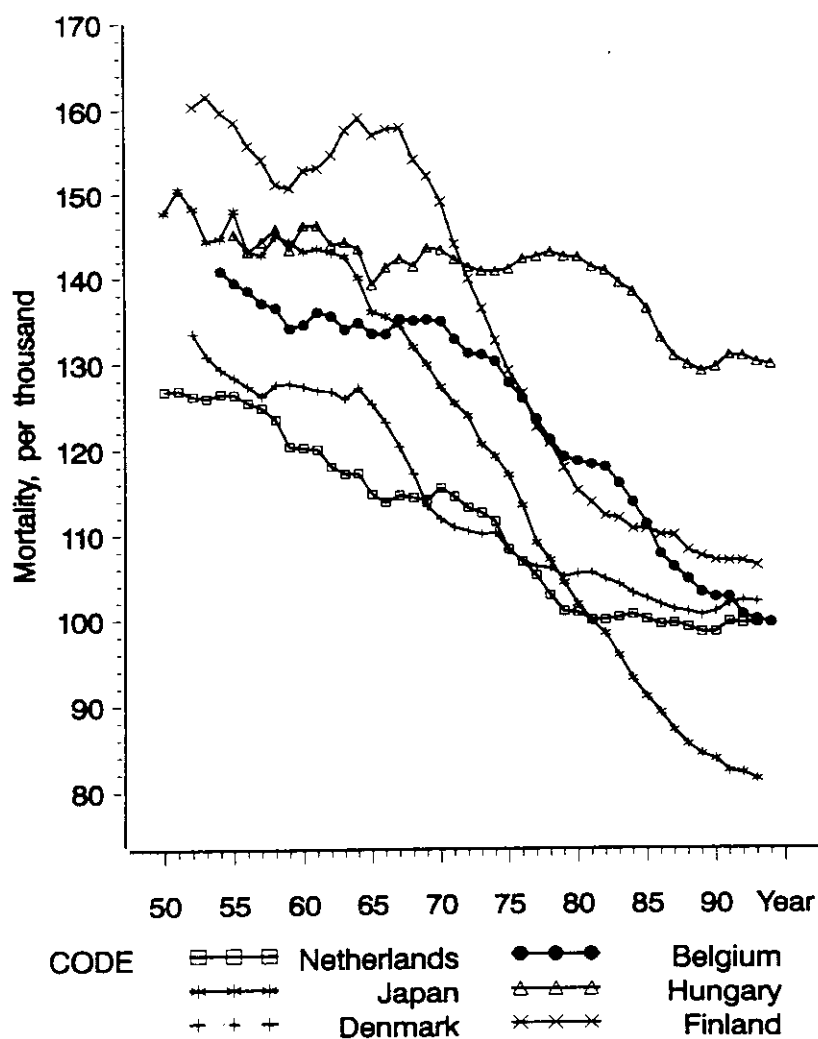


Fig. 6

(Table 1). The Netherlands was 18th and 17th, respectively. Japan ranked first in the 45-74 year age group but second to France in the 75-85+ year age group. Hungary ranked last with mortality increasing in the 45-74 year age group and slightly decreasing in the 75-85+ year age group. France, Switzerland, Spain, Finland and Austria were the best in Western Europe. Norway, Denmark had the worst results and Sweden was average.

TABLE 1
Per cent change in all-cause mortality between 1955* and 1992*

	Age adjusted			
	45-74 y.		75-85+ y.	
	Men	Women	(M+W)/2	(M+W)/2
Japan	-54 (1)	-69 (1)	-60 (1)	-42 (2)
France	-40 (2)	-56 (3)	-46 (2)	-46 (1)
Switzerland	-39 (4)	-56 (3)	-46 (2)	-39 (3)
Australia	-44 (3)	-49 (7)	-46 (2)	-36 (4)
Spain	-35 (7)	-58 (2)	-44 (5)	-36 (4)
Finland	-38 (5)	-52 (5)	-43 (6)	-33 (6)
Canada	-35 (7)	-45 (10)	-39 (7)	-32 (7)
Italy	-28 (12)	-51 (6)	-37 (10)	-32 (7)
Austria	-33 (9)	-47 (9)	-38 (9)	-30 (10)
Belgium	-33 (9)	-48 (8)	-39 (7)	-28 (11)
England and Wales	-36 (6)	-34 (15)	-35 (11)	-31 (9)
Sweden	-24 (15)	-45 (10)	-33 (12)	-28 (11)
U.S.	-32 (11)	-34 (15)	-33 (12)	-24 (13)
Portugal	-27 (13)	-42 (12)	-33 (12)	-22 (17)
Ireland	-22 (16)	-42 (17)	-31 (15)	-23 (15)
New Zealand	-26 (14)	-31 (19)	-28 (16)	-23 (15)
Greece	-19 (17)	-37 (14)	-26 (17)	-24 (13)
The Netherlands	-11 (18)	-40 (13)	-23 (18)	-22 (17)
Norway	- 7 (19)	-32 (18)	-17 (19)	-16 (20)
Denmark	- 1 (20)	-20 (20)	-10 (20)	-19 (19)
Hungary	+47 (21)	-13 (21)	+21 (21)	- 7 (21)

* See methods.

The countries are ranked according to the mean of both age classes as (M+W)/2. In each age class the ranking is given between brackets.

2.3 Cardiovascular mortality in the 45-74 year age class, 1971-93

2.3.1 Total cardiovascular mortality (TCV)

In men TCV is decreasing much faster since 1971 in Belgium and its regions (Fig. 7). It became lower than The Netherlands from 1981 on for Flanders and from 1985 on for Belgium. In women (Fig. 8) TCV is always lowest in The Netherlands except for Flanders in 1993. There is possibly some underclassification of TCV in Belgium and its regions (compare with Figures 1 and 2).

2.3.2 Ischaemic heart disease mortality (IHD)

Reported IHD is much lower in Belgium than in The Netherlands, especially in men, but is nevertheless decreasing faster in Belgium

Total Cardiovascular mortality
Men, age – adjusted 45–74 y per thousand
5 yearly smoothed

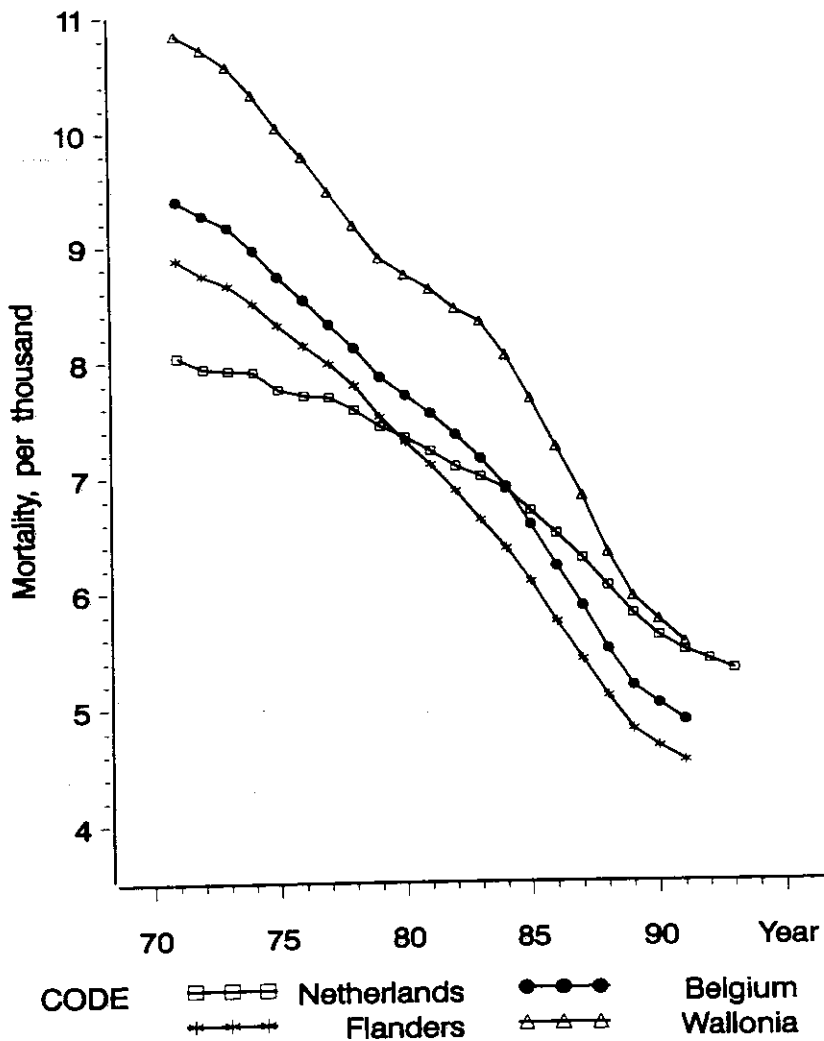


Fig. 7

(Fig. 9). This difference in reported IHD is certainly due to underclassification (14), however the trends are presumed to be reliable (15). As a consequence TCV minus IHD and minus stroke mortality is much higher in Belgium (Fig. 10) than in The Netherlands, but the gap is decreasing over the years.

Total Cardiovascular mortality
Women, age-adjusted 45-74 y per thousand
5 yearly smoothed

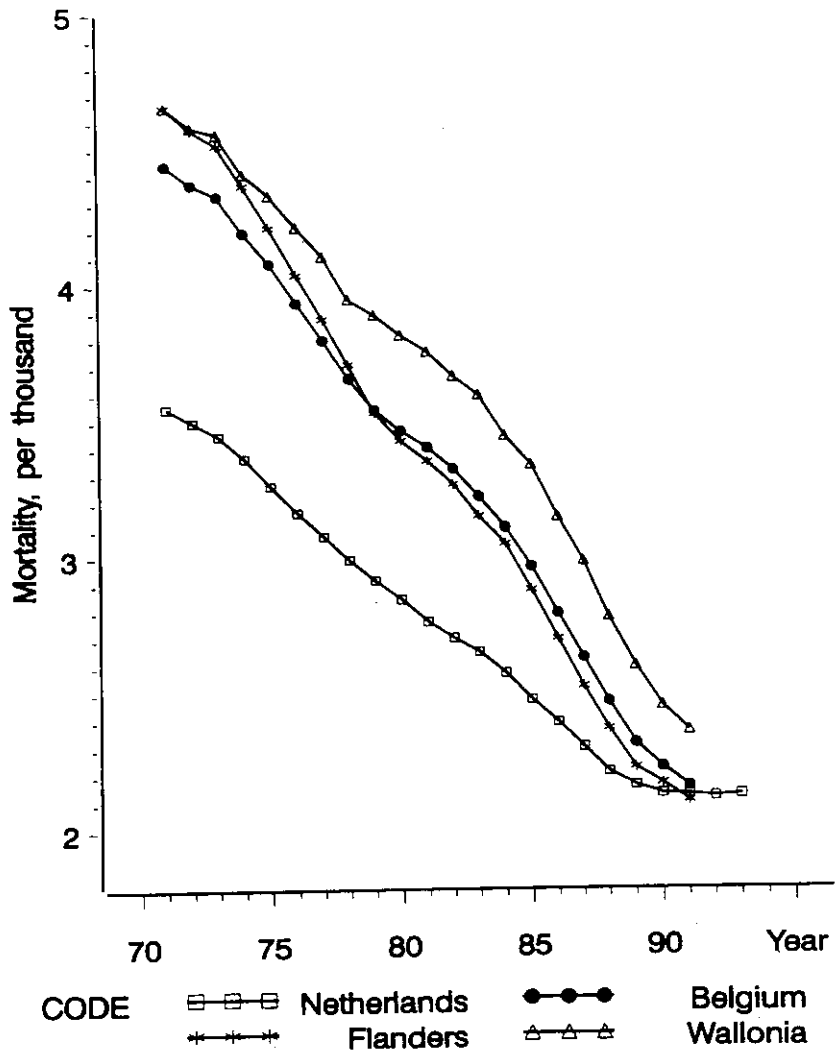
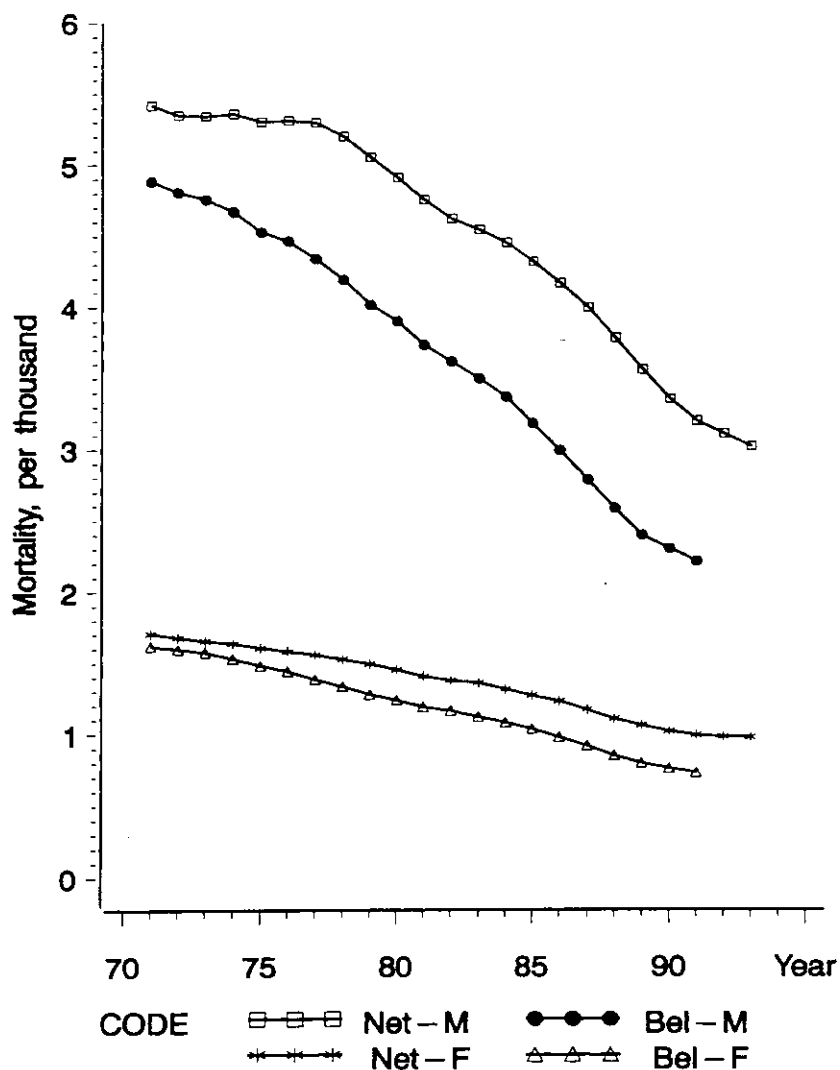


Fig. 8

2.3.3 Stroke mortality

Stroke mortality (Fig. 11) in Belgium was much higher in 1971 than in The Netherlands for each sex. In 1991 only a small difference continued to exist between the two countries.

Ischaemic Heart Disease mortality
Age – adjusted 45 – 74 y per thousand
5 yearly smoothed



2.4 Cancer Mortality in the 45-74 year age class, 1950-93

2.4.1 Total cancer mortality

As for TCV only the 45-74 year age class is used. In men (Fig. 12) total cancer mortality follows a similar pattern in Belgium and The Netherlands: increasing up to 1979 and decreasing afterwards, but always higher in Belgium.

Stroke mortality
Age-adjusted 45-74 y per thousand
5 yearly smoothed

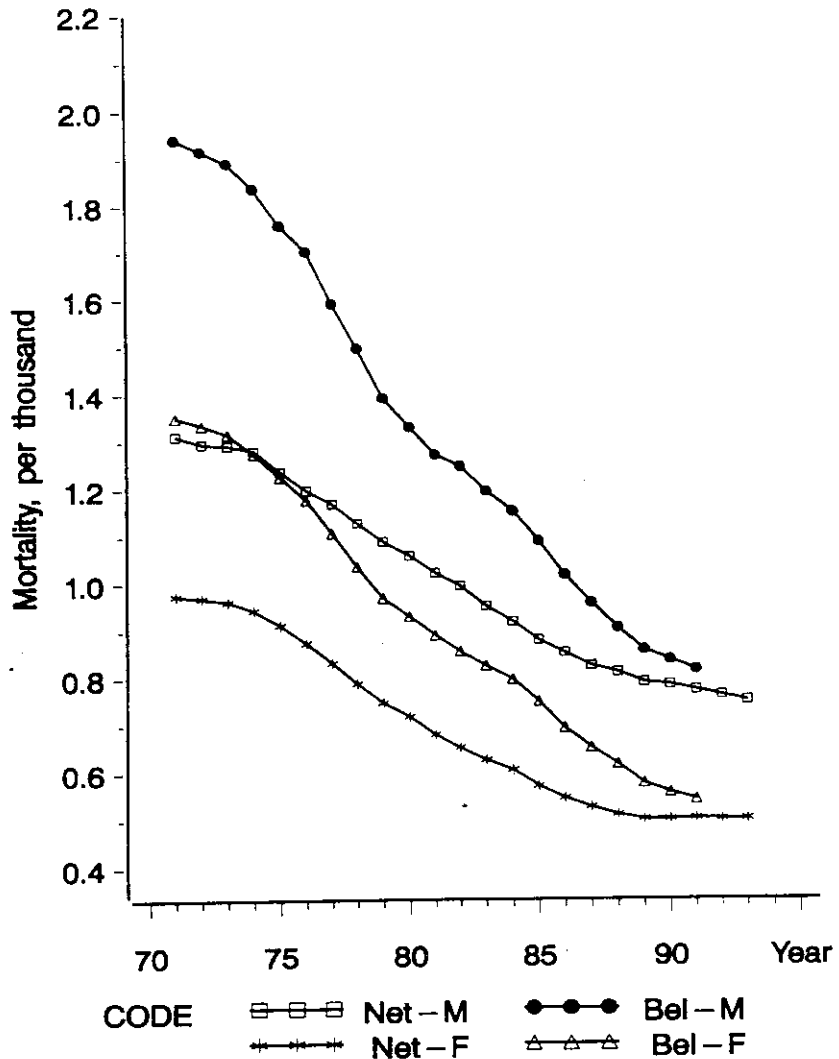


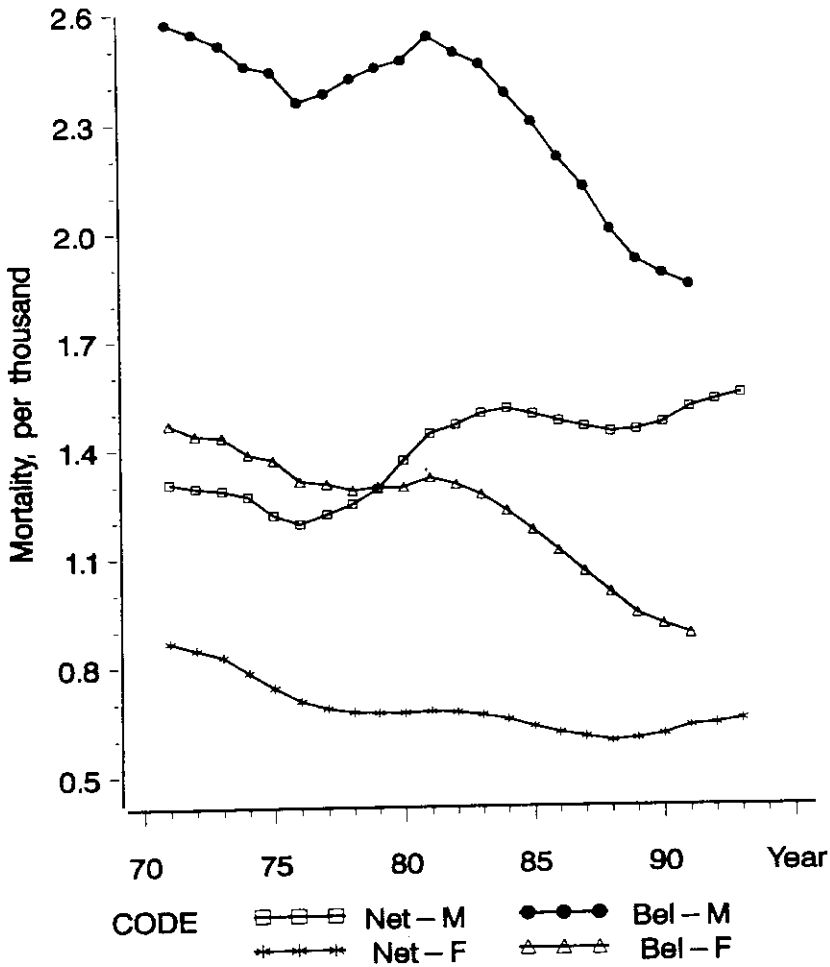
Fig. 10

In women total cancer mortality is decreasing since the fifties, except for a small increase in The Netherlands after 1981. For both sexes together total cancer mortality is now equal to the value observed in 1959 for Belgium and in 1963 for The Netherlands.

2.4.2 Lung cancer mortality

In men (Fig. 13) the peak value is again around 1979, but reported lung cancer mortality is lower in Belgium than in The Netherlands up to

TCV minus IHD minus Stroke mortality
Age-adjusted 45-74 y per thousand
5 yearly smoothed



* < 0.05, ** < 0.01, *** < 0.001

Fig. 11

1977. In women lung cancer mortality is still increasing but to a greater extent in The Netherlands since 1975.

2.4.3 Stomach cancer mortality

Stomach cancer mortality is decreasing similarly since the fifties. After 1969, and only in men, it is decreasing faster in Belgium than in The Netherlands (Fig. 14).

Total Cancer mortality
Age – adjusted 45 – 74 y per thousand
5 yearly smoothed

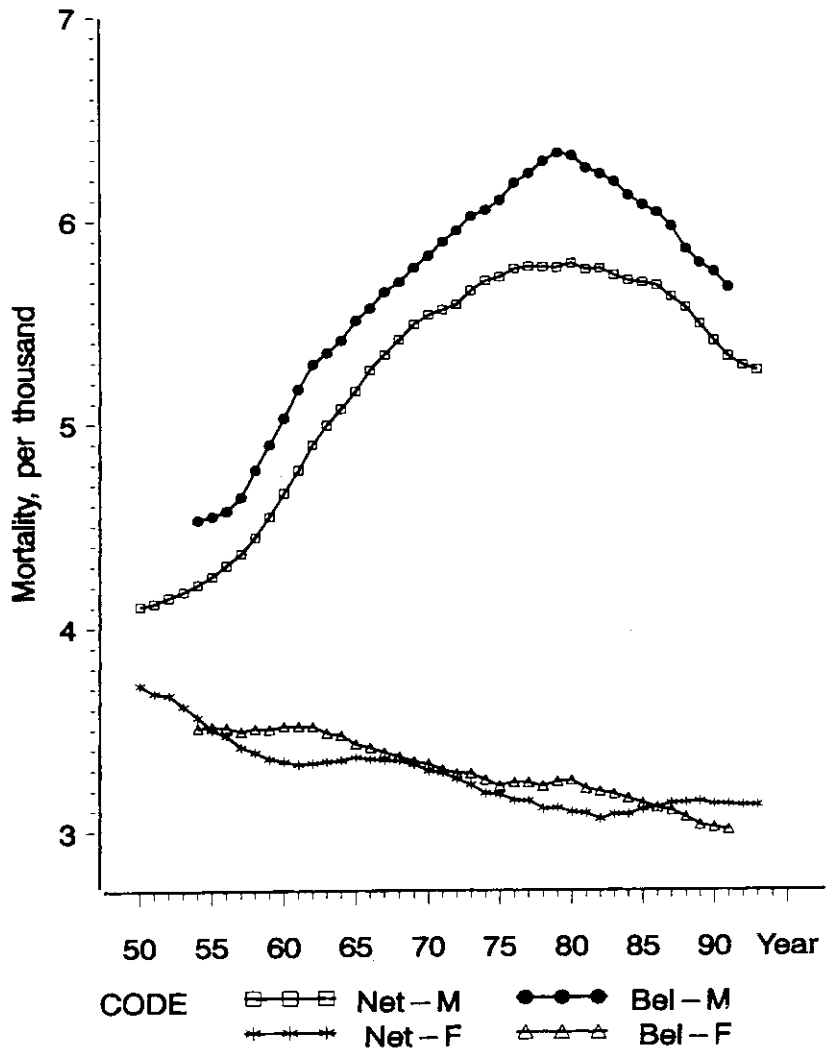


Fig. 12

2.4.4 Colon cancer mortality

Colon cancer mortality presents, for reasons unknown, a more chaotic picture, but the overall trends are simple (Fig. 15). In both men and women colon cancer mortality in the fifties was much higher in Belgium than in The Netherlands, whereas now there remains only a small difference. The overall trend is an increasing mortality in men and a decreasing mortality since 1970 in women.

Lung Cancer mortality
Age-adjusted 45-74 y per thousand
5 yearly smoothed

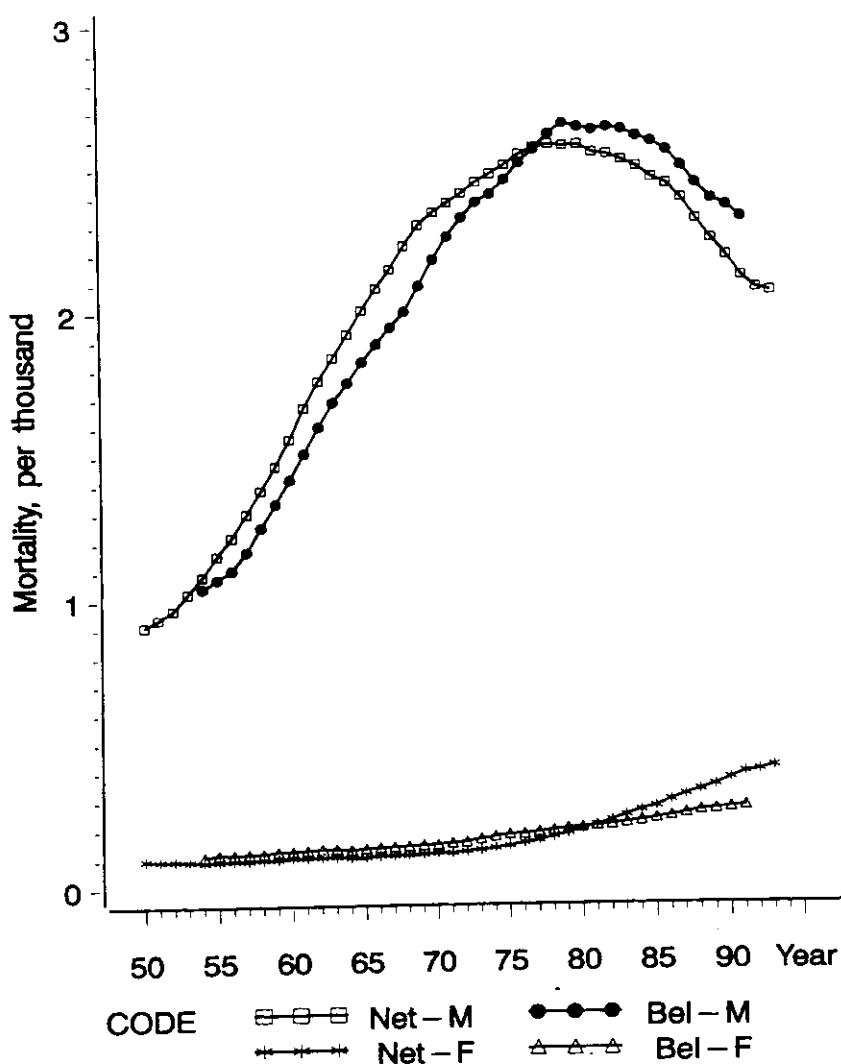


Fig. 13

2.4.5 Rectum cancer mortality

Rectum cancer mortality behaves differently (Fig. 16). It is decreasing in both countries and in both sexes since the fifties, but more so in Belgium. Another difference with colon cancer is the sex ratio, actually 1.36 in Belgium and 1.31 in The Netherlands. For rectum cancer the sex ratio is 2.04 in Belgium and 1.97 in The Netherlands.

Stomach Cancer mortality
Age – adjusted 45 – 74 y per thousand
5 yearly smoothed

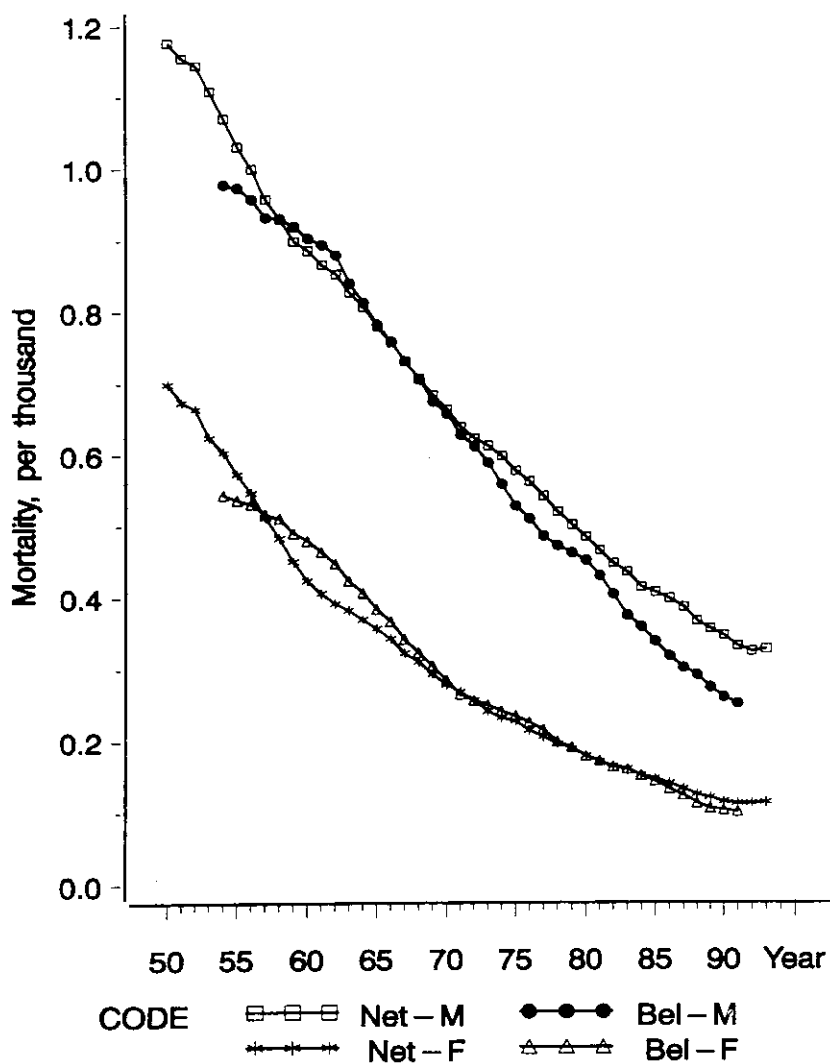


Fig. 14

2.4.6 Prostate and breast cancer mortality

Prostate and breast cancer mortality behave similarly in each country (Fig. 17). Since the fifties prostate and breast cancer mortality are lower in The Netherlands, but increasing faster. The actual level is therefore identical for both countries. However, in the age class 45-74 years, breast cancer mortality is nearly 3 times higher than prostate cancer mortality. Prostate cancer in the 75-85+ year age class is 3 times higher than breast cancer mortality (data not shown).

Rectum Cancer mortality
Age – adjusted 45 – 74 y per million
5 yearly smoothed

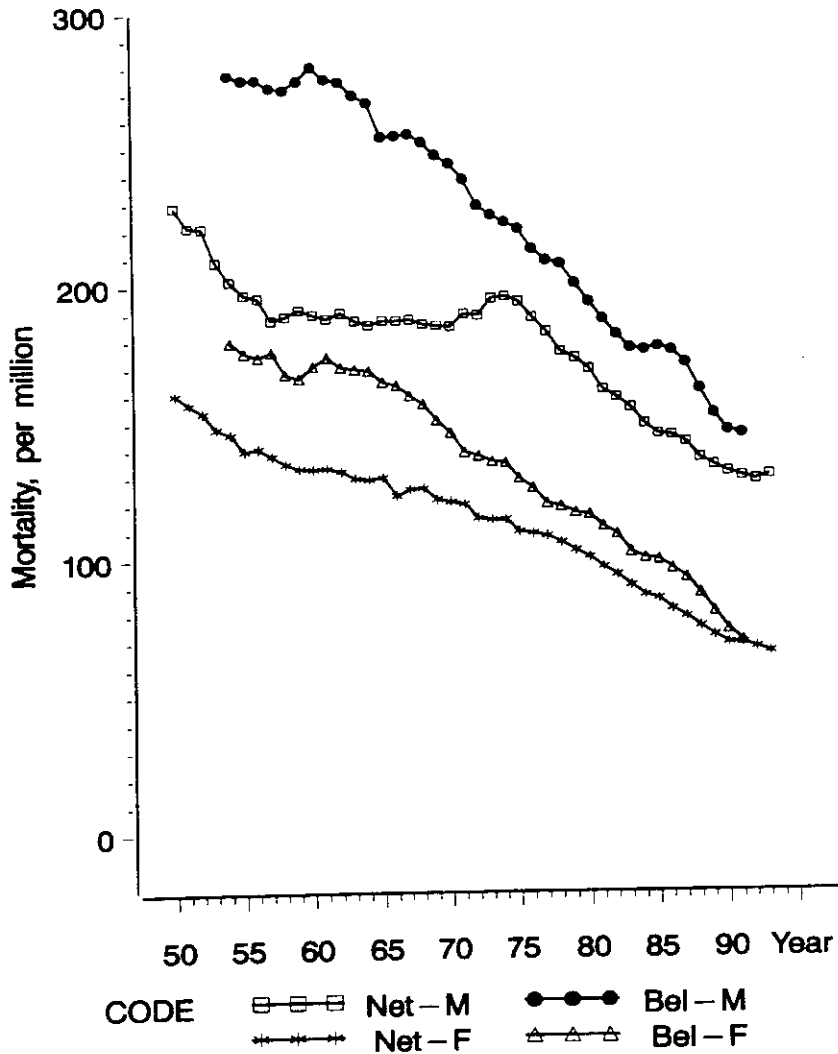


Fig. 15

2.4.7 Uterus cancer mortality

Cervix cancer mortality is according to the death certificates lower in Belgium, but is decreasing faster in The Netherlands, at least up to 1980 (Fig. 18). The actual levels are identical.

The opposite is seen for total uterus, which includes cervix cancer mortality, but with still slightly higher values in Belgium in the nineties.

Colon Cancer mortality
Age-adjusted 45–74 y per thousand
5 yearly smoothed

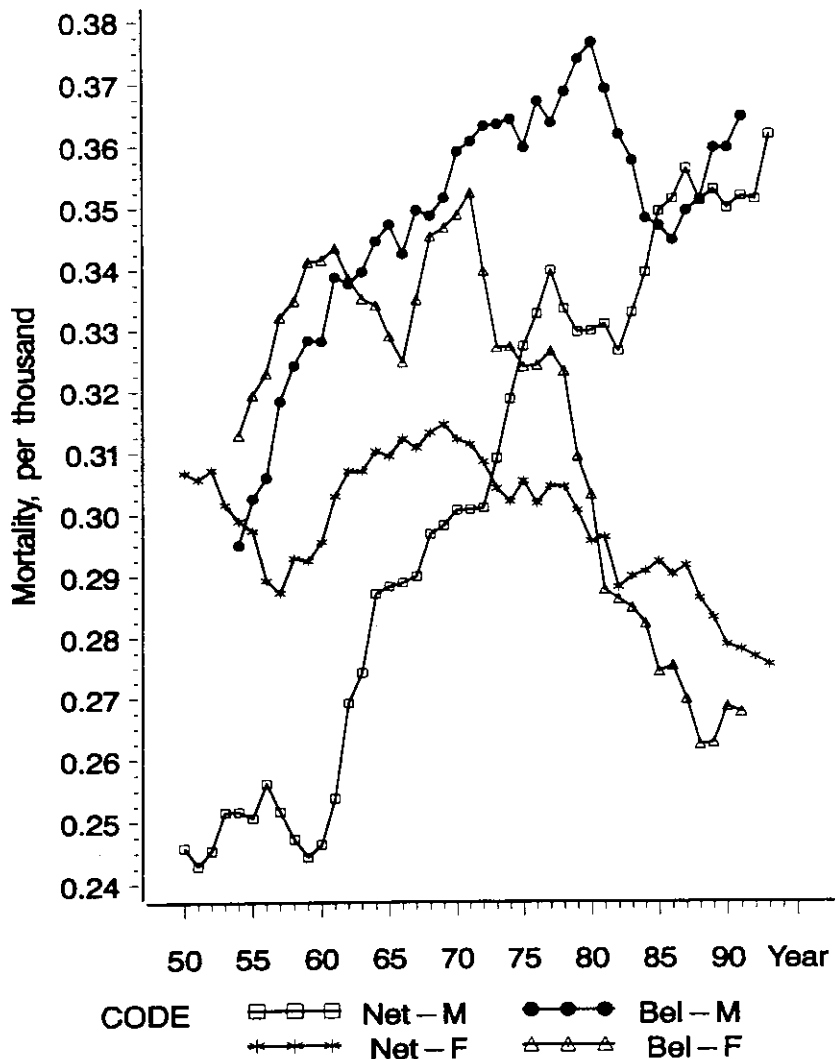


Fig. 16

Therefore the chances are that cervix cancer in Belgium was previously underestimated.

Changes in cancer mortality, age adjusted 45-74 years, 1980-91 (B) and 1980-93 (NL) are given in Table 2 as yearly changes in number of deaths over the given period. Total cancer decreased significantly in both sexes in Belgium and to a minor degree, and only in men, in The Netherlands. It can be seen that for Belgian men 91% of the total decrease is due to changes in lung, stomach and rectum

Prostate and Breast Cancer mortality
Age-adjusted 45-74 y per million
5 yearly smoothed

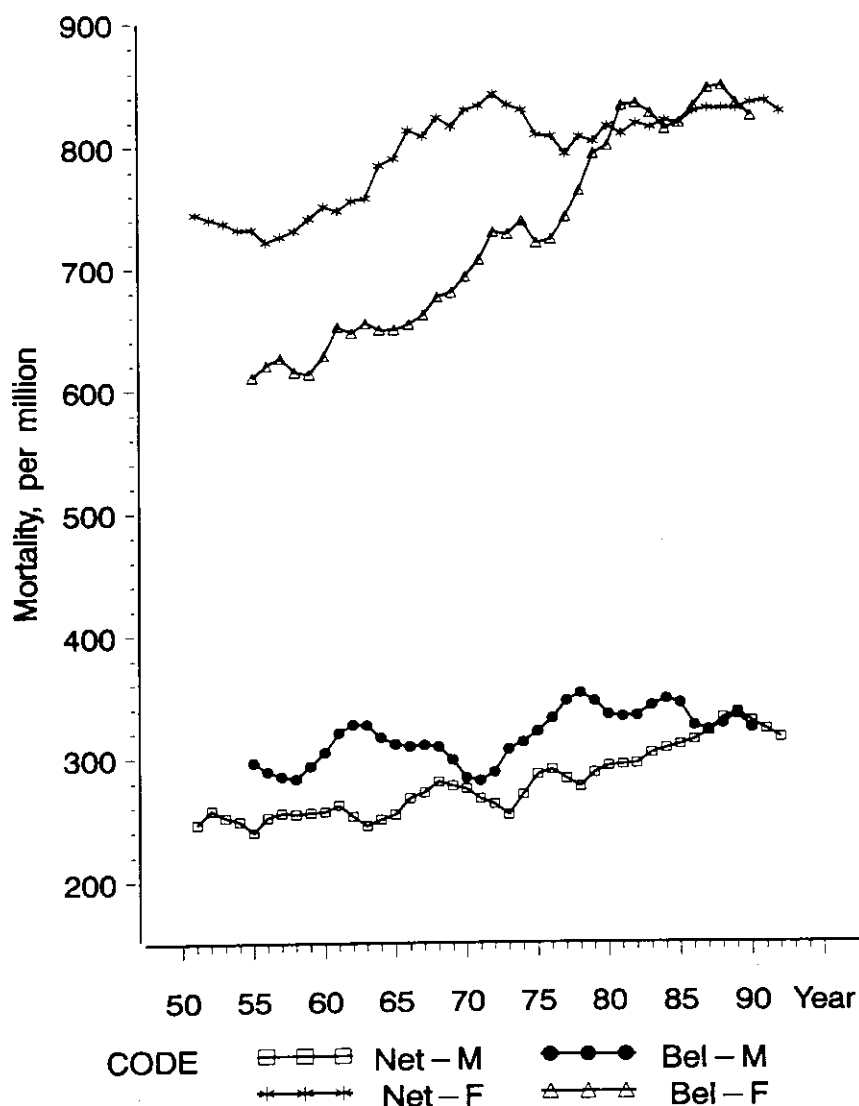


Fig. 17

cancer mortality versus only 58% for Belgian women using the changes in lung, stomach, rectum and total uterus cancer. With the exception of cervix cancer (one half to one third of total uterus cancer) all mentioned cancers are not markedly influenced by treatment or by early detection.

Total Uterus and Cervix Cancer mortality
Women, age – adjusted 45 – 74 y per million
5 yearly smoothed

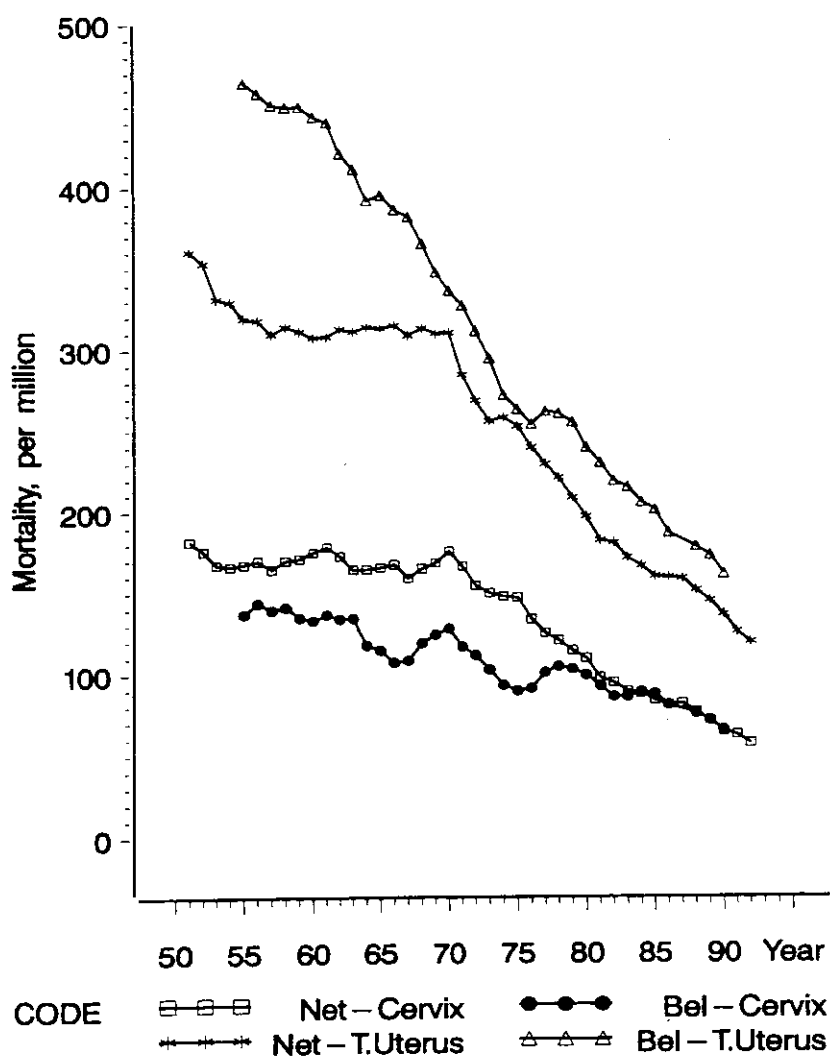


Fig. 18

2.5 Yearly change in number of deaths from 13 causes (11 in men) in Belgium (1980-1991) and The Netherlands (1980-1993)

The changes after 1980 are indicated in Table 3 for the 45-74 year age class and in Table 4 for the 75-85+ year age class. Among 48 possible comparisons 38 are in favour of Belgium, 9 in favour of the The Netherlands and 1 ex aequo (sign test, $p < 0.0001$). For the period 1968-80 (with no data on cervix cancer) there is no statistical differ-

TABLE 2
Yearly changes in cancer mortality per million
Age adjusted 45-74 years

	Belgium (1980-91)		The Netherlands (1980-93)	
	Men	Women	Men	Women
Total ca	-66 ³	-24 ³	-47 ³	+8 ²
Lung ca	-36 ³	+7 ³	-47 ³	+18 ³
Stomach ca	-19 ³	-8 ³	-13 ³	-6 ³
Colon ca	n.s.	n.s.	n.s.	-1 ¹
Rectum ca	-5 ²	-5 ³	-3 ³	-3 ³
Prostate ca	n.s.	—	+3 ³	—
Breast ca	—	n.s.	—	n.s.
Total uterus ca	—	-8 ³	—	-6 ³
Other ca	-6 ¹	-10 ²	+13 ¹	+6 ¹

¹ $p < 0.05$; ² $p < 0.01$; ³ $p < 0.001$.

ence, with 26 comparisons in favour of Belgium, 17 in favour of The Netherlands and 3 ex aequo (data not shown). The overall comparison is 64 better in Belgium, 26 in The Netherlands and 4 ex aequo (sign test, $p < 0.01$).

TABLE 3
Yearly change in number of deaths per million
Age adjusted 45-74 years

	Belgium (1980-91)*		The Netherlands (1980-93)	
	Men	Women	Men	Women
All-cause	-429 ³	-204 ³	-224 ³	-45 ³
Total ca	-66 ³	-24 ³	-47 ³	-8 ²
Lung ca	-36 ³	+7 ³	-47 ³	+18 ³
Stomach ca	-19 ³	-8 ³	-13 ³	-6 ³
Colon ca	0	0	+3 ¹	-1 ¹
Rectum ca	-5 ³	-5 ³	-3 ³	-3 ³
Prost./Breast ca	0	0	+3 ¹	0
Total uterus ca			-8 ³	-6 ³
Cervix ca			-3 ³	-4 ³
TCV	-303 ³	-140 ³	-177 ³	-63 ³
IHD	-170 ³	-52 ³	-159 ³	-42 ³
CVA	-53 ³	-38 ³	-25 ³	-17 ³
Cirrhose**	-6 ³	-2 ²	0	0

* Except all-cause 1980-94; ** Starting in 1975, since 6 years were missing between 1978 and 1985.

0 Not significant; ¹ $p < 0.05$; ² $p < 0.01$; ³ $p < 0.001$.

TABLE 4
Yearly change in number of deaths per million
Age adjusted 75-85+ years

	Belgium (1980-91)*		The Netherlands (1980-93)	
	Men	Women	Men	Women
All-cause	-1 584 ³	-1 760 ³	0	0
Total ca	0	-157 ²	+125 ²	-44 ¹
Lung ca	+81 ¹	+8 ²	0	+10 ²
Stomach ca	-78 ³	-61 ³	-85 ³	-46 ³
Colon ca	+22 ¹	-32 ³	0	-15 ¹
Rectum ca	-38 ³	-18 ²	-33 ³	-11 ³
Prost./Breast ca	0	+14 ¹	+92 ³	0
Total uterus ca		-23 ³		0
Cervix ca		-11 ³		0
TCV	-1 987 ³	-1 638 ³	-736 ³	-673 ³
IHD	-365 ³	-243 ³	-438 ³	-349 ³
CVA	-594 ³	-513 ³	-144 ³	-135 ³
Cirrhose**	-25 ³	-13 ³	0	-5 ³

* Except all-cause 1980-94; ** Starting in 1975, since 6 years were missing between 1978 and 1985.

0 Not significant; ¹ $p < 0.05$; ² $p < 0.01$; ³ $p < 0.001$.

2.6 Life expectancy

Life expectancy in 1967 and 1992 observed for the average of both sexes in the 15 actual E.U. states, including regional data in Germany and U.K. are given in Table 5. Data from Japan and Hungary are added for comparison. Data from Belgium, its regions and provinces (1980 to 1992) are given in Table 6. All values including the change in life expectancy between 1967 (or 1980) and 1992 are ranked from the highest value to the lowest.

TABLE 5
Life expectancy at birth in the E.U. countries

	1992 (M + W)/2	1967 (M + W)/2	Gain in years 1992-67 (M + W)/2
Sweden	78.3 (1)	74.2 (1)	4.1 (13)
France	78.1 (2)	71.9 (5)	6.2 (5)
Netherlands	77.4 (3)	73.8 (2)	3.6 (14)
Greece	77.4 (4)	72.6 (4)	4.8 (11)
Italy ¹	77.1 (5)	70.7 (9)	6.4 (2)
Spain	77.1 (6)	71.7 (6)	5.4 (7)
U.K.	76.5 (7)	71.6 (7)	4.9 (10)
Belgium ²	76.4 (8)	70.8 (8)	5.6 (6)

TABLE 5 (continued)
Life expectancy at birth in the E.U. countries

	1992 (M + W)/2	1967 (M + W)/2	Gain in years 1992-67 (M + W)/2
Austria	76.2 (9)	70.0 (12)	6.2 (4)
Germany	76.0 (10)	70.7 (10)	5.4 (7)
Finland	75.7 (11)	69.5 (14)	6.3 (3)
Denmark	75.4 (12)	72.9 (3)	2.5 (15)
Ireland	75.4 (12)	70.7 (10)	4.7 (12)
Luxembourg ²	75.3 (14)	70.0 (12)	5.3 (9)
Portugal	74.5 (15)	66.2 (15)	8.3 (1)
<i>Regional data</i>			
West-Germany ³	76.0	70.8	5.2
East-Germany ³	72.9	70.7	2.2
United Kingdom			
England and Wales	76.7	71.8	4.9
Scotland	74.6	70.1	4.5
North Ireland	75.7	70.8	4.9
<i>For comparison:</i>			
Japan	79.7	71.5	8.2
Hungary	69.2	69.5	-0.3

¹ 1991; ² 1991-93; ³ 1990.

Life expectancy in men is 3 to 4 years lower and in women 3 to 4 years higher.
Data from W.H.O., 1986, 1993, 1994, except from National Institute of Statistics, 1994, for Belgium.

TABLE 6
Life expectancy at birth in Belgium

	1992 (M + W)/2	1980 (M + W)/2	Gain in years 1992-80 (M + W)/2
Belgium	76.4	73.4	3.0
Flanders	77.1	74.2	2.9
Wallonia	75.2	72.4	2.8
Brussels	76.2	73.3	2.9
North of Brabant			
West-Vlaanderen	77.6 (1)	74.6 (1)	3.0
Antwerpen	77.2 (2)	74.3 (2)	2.9
Limburg	77.1 (4)	74.2 (3)	2.9
Oost-Vlaanderen	77.0 (4)	74.3 (2)	2.7
South of Brabant	76.7 (6)	73.9 (5)	2.8
South of Brabant			
Luxembourg	76.8 (5)	74.0 (6)	2.8
Liège	75.5 (7)	72.4 (7)	3.1
Namur	75.2 (8)	72.3 (8)	2.9
Hainaut	75.1 (9)	72.2 (10)	2.9
	75.0 (10)	72.3 (8)	2.7

Data from National Institute of Statistics, Brussels, 1985 and 1994.

Although one would expect the highest gain in countries with a lower life expectancy, there is no significant rank correlation between the values observation in 1967 (average of both sexes) and the gain in years (1992-67) (Table 5).

Belgium has a median 8th place in the E.U. notwithstanding regular comments in the medical press that Belgium is a country with one of the lowest life expectancies in the E.U. (16). The considerable publishing delay of Belgian data in W.H.O. publications is the mean reason for this error, e.g. data for 1993 in The Netherlands were already published by W.H.O. in 1994, whereas for Belgium data were only available up to 1989. The highest gain is observed in Portugal: 8.3 years and the lowest in Denmark 2.5 years (Table 5), with best life expectancy ranking changing thereby from the 3rd place in 1967 to the 12th in 1992 (Table 5). East-Germany had a gain of 2.2 years similar to that of Denmark (2.6 years), whereas Japan gained 8.2 years and Hungary lost 0.3 years (Table 5).

Among the Belgian provinces the best results are seen in the North of Brabant and the worst in Hainaut (Table 6). Oost-Vlaanderen has the lowest value in Flanders (0.9 year difference compared to the best value) and South of Brabant has the best results in Wallonia (1.8 year difference with Hainaut). Remark that the mean results of the provinces Liège and Hainaut, which are heavily industrialized, are identical to those of the more agricultural (less polluted) province of Namur. The gain over the years between 1980 and 1992 is not very different, ranging from 2.7 years to 3.1 years (Table 6).

All-cause mortality over age 44 in 1992 (average of both sexes, Figs. 3 and 6) is only slightly higher in Belgium and is lower in Flanders than in The Netherlands (Figs. 1, 2 and 4, 5), whereas life expectancy in Belgium is 1 year lower and in Flanders 0.3 year lower than in The Netherlands. This discrepancy is due to the twice as high total violent death rates in Belgium and Flanders as compared to The Netherlands. The same is true for motor vehicle accidents and suicide rates. Violent deaths under the age of 45 years have an impact on life expectancy (17).

2.7 Life style (changes in Belgium, Flanders, Wallonia and The Netherlands)

Data on food consumption are available since 1960. From Table 7 it appears that fat consumption in % of energy was already lower in

The Netherlands in 1960 and that over the years the difference gradually disappeared. There is still a difference between Flanders and Wallonia in favour of the former (Table 7).

TABLE 7
Fat intake in % energy

The Netherlands	1960 (4) <i>n</i> = 1 049	1987/88 (5) <i>n</i> = 5 898 ¹ Nevo 1986/87 ²	1992 (6) <i>n</i> = 6 218 ¹	1992 (6) <i>n</i> = 6 218 ¹ Nevo 1993 ²
Total	41.9	40.6	39.3	37.4
Saturated	17.5	16.6	16.1	14.2
Monounsaturated	18.0	15.6		13.8
Polyunsaturated	5.8	7.0		6.9
Belgium	1960 (7)	1979 (8, 9)	1982 (10)	1991/92 (11)
Flanders	<i>n</i> = 769	<i>n</i> = 2 600 families ¹	<i>n</i> = 6 870	<i>n</i> = 492
Total	38.2	41.5	41.5	39.9
Saturated	19.1	17.3	16.5	16.6
Monounsaturated	14.7	14.3	15.0	15.6
Polyunsaturated	3.8	8.1	8.5	6.9
Belgium	1979 (8,9)	1982 (10)	1991/92 (11)	
Wallonia		<i>n</i> = 2 600 families ¹	<i>n</i> = 4 098	<i>n</i> = 71
Total		43.3	42.5	41.0
Saturated		19.2	18.5	18.9
Monounsaturated		15.5	16.0	15.9
Polyunsaturated		7.1	6.5	5.1

¹ Followed regularly over 1 year. ² Nevo is a food table, updated in 1993. Data courtesy of "Cardiologie", 1995, 2: 354-360.

Those results are confirmed by differences in purchased food in Belgium, measured during one year by the LEI Panel (Ministry of Agriculture) among 2 900 families randomly distributed over the country (Table 8). There is a marked difference between margarine and butter consumption in Flanders and Wallonia (Table 9). It should also be realized that the composition of margarine was improving over the years. In 1968 no dietetic, salt free margarine was available, in 1990 it was 23% of all margarines.

Salt intake is another risk factor in Belgium that changed favourably over the years resulting a.o. in a marked decrease of blood pressure values in the elderly (Table 10). The increase of systolic blood

TABLE 8
Trends in food purchases in kg/year*

	Belgium				
	1955	1968	1975	1981	1990
Butter	11.0	9.4	7.5		4.9
Margarine**	9.6	13.2	11.2		8.6
Poultry			9.6		12.4
Beef and porc			32.7		25.4
Salted meat products				14.2	17.0
Fresh cheese			2.1		3.9
Other cheese			7.5		10.1
Wholemilk				50.5	28.2
Half skimmed milk				8.0	28.3
Skimmed milk				6.7	8.9
Eggs/year				136	109
Fruits			54		68
Potatoes			57		48
Tomatoes and endives			9.1		12.5
Deepfreeze vegetables			0.1		4.5

* Data from L.E.I. panel, Ministry of Agriculture, Brussels, from 2 900 families followed over 1 year.

** No dietetic, saltfree margarine was available until 1968.
In 1990 it represented 23% of total margarine consumption.

TABLE 9
Trends in food purchases in kg/year*

		Flanders	Wallonia
		Butter	1975
	1990	2.5	8.7
Margarine	1975	14.1	7.4
	1990	9.8	7.0

* Data from L.E.I. panel, Ministry of Agriculture, Brussels.

TABLE 10
Belgium: changes in systolic blood pressure and 24 h urinary sodium excretion
Age 25-55 years

	mmol sodium/24 h	Difference in mm SBP Age 55 minus age 25
1966	203	—
1968	179	22
1972	169	15
1982	142	14
1983	146	12
1985	158	11
1986	144	10

In the elderly (75+) SBP decreased from 165 mm in 1967 to 145 mm in 1986 and sodium from 237 to 174 mmol/24 h. Source of data: reference 19.

pressure with age, which is typically related to the average salt intake of the population (18) is decreasing in Belgium from a difference of 22 mmHg between ages 55 years and 25 years in 1968 to 10 mmHg in 1986 (19).

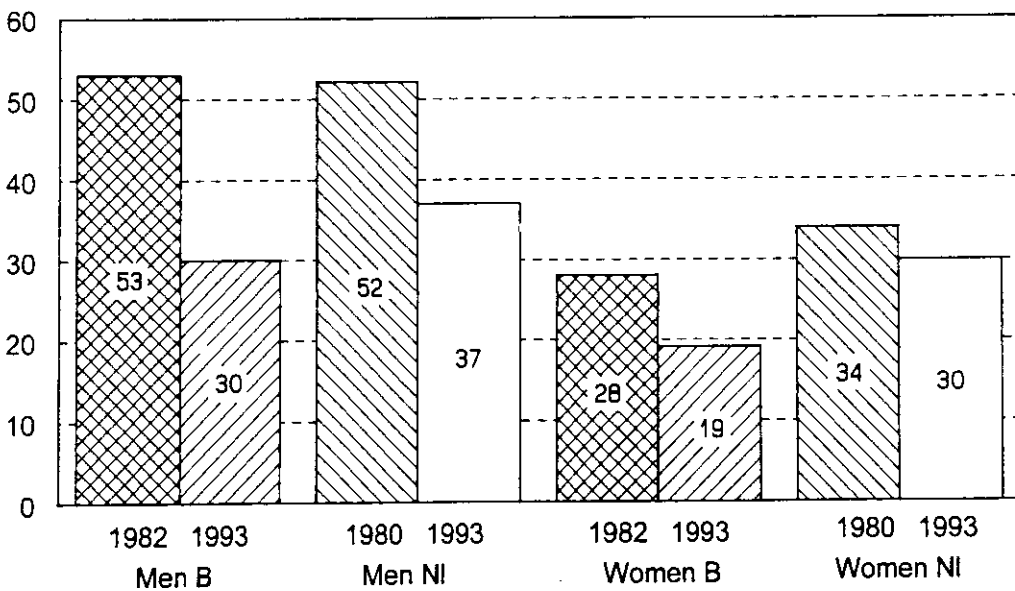
Finally the smoking habits have improved markedly since the eighties and more so in Belgium than in The Netherlands (20) (Fig. 19). However, in the group under 18 years smoking habits are deteriorating since 1990, at least in Flanders (21). This could affect the future.

3. Discussion

The main discussion point is the relative importance of life-style changes versus medical treatment and health care in general.

Although it is acknowledged that medical treatment can be important for the individual and that it may induce some decrease in mortality it is difficult to consider medical treatment as an important

% Smokers (age 18 and over)



Source of data: BASP, L. Joossens et al, 1994

Fig. 19

factor at the population level. The data presented in Figures 3 and 6, and in Table 1 should then be interpreted as showing that medical treatment is very effective in Japan since 1950 and similarly in Finland and Belgium since the seventies, but to a much lower degree in The Netherlands, Norway and Denmark and even totally ineffective in Hungary. Medical doctors and the level of medical care are not better in Belgium than in The Netherlands or Denmark and in Flanders not better than in Wallonia. On the contrary there are more MD's in Wallonia than in Flanders after adjustment for population, and medical care related expenditure is much higher in Wallonia. Another argument are the good results obtained in Belgium since 1980 for both men and women, and in both age classes and 13 causes of death, as compared to The Netherlands (Tables 3 and 4).

Data from other countries confirm the lesser importance of medical care, e.g. the relatively good health in recent years in countries such as Cuba, Costa-Rica and the P.R. of China (urban population). They have life expectancies, average of both sexes, of 75.6, 74.7 and 73.4 years, respectively (2).

The mortality trends in Belgium and The Netherlands before 1970 — increasing in men and decreasing in women — are difficult to explain. The susceptibility to saturated fat is different in men and women (22), but there is no evidence that saturated fat intake increased during that period. On the other hand infectious diseases decreased markedly from 1950 to 1970. The level of infectious diseases correlated negatively with the sex ratio of IHD (23).

The most important risk factor for all-cause mortality is saturated fat: it induces higher serum cholesterol (LDL) in the population (7, 24), increases clotting mechanisms (25) and blood pressure (26) resulting in accelerated atherosclerosis. It is probably promoting rectum cancer (27), lung cancer (in the presence of smoking) (28), and to a somewhat lesser degree, colon, prostate and breast cancer (5, 29, 30).

Smoking is also an important risk factor but only in countries with a high saturated fat intake. Japan has more than twice the number of smokers observed in Belgium and has much lower levels of IHD and of lung cancer mortality, combined with the highest life expectancy in the world.

Salt intake is the third factor, associated with high levels of all-cause mortality in Japan and Finland in the fifties (Figs. 3 and 6)

and of stroke and stomach cancer (data not shown). A high level of stroke mortality is generally combined with a high level of stomach cancer and of salt intake (31). The positive relationship of salt intake and blood pressure was confirmed in a meta-analysis of data between and within countries (32-34).

There is no good evidence that obesity is an important risk factor e.g. for stroke in the elderly (35). BMI from the elderly (mean age 70 years) increased in Belgian men from 25.1 in 1967 to 26.2 in 1986 and remained nearly constant at 28.0 in women (19). The higher level of obesity in women went together with a lower mortality than in men and an increasing obesity in men with a decreasing mortality.

Beneficial factors are polyunsaturated fat intake (up to levels of 6-7% of energy), monounsaturated fat and anti-oxydantia from fruit and vegetables, and possibly from red wine and tea.

The important decrease in mortality in the elderly observed in Belgium since 1980 (Table 4) is further proof of the relative little importance of medical treatment in this age class which was never submitted to vigorous treatment. It contradicts also the general opinion that preventive treatment in the elderly is ineffective. Stroke mortality in Belgian elderly shows the second highest decrease since 1980 in both men and women in comparison with the changes in all-cause mortality (Table 4): namely -594 deaths/year/million for stroke versus -1 584 for all-cause in men and -513 versus -1 760 in women. In The Netherlands this was respectively -144 and zero in men and -135 and zero in women. It has been shown that the reduction in stroke mortality started long before mass treatment of hypertension was introduced, e.g. since 1925 in the U.S. (36).

The data presented here are consistent with the previously mentioned changes in life-style — in terms of decreasing fat intake, salt intake and smoking habits and increased intake of fruits and vegetables — that occurred in both countries since the sixties.

Although mortality decreased markedly in Belgium, the actual levels of mortality, especially of cancer, are still very high (Figs. 13 to 18). Belgium ranks 30th out of 34 countries in 1990 for lung cancer and 27th for total cancer in men. So there is no reason for complacency. The importance of preventive measures at the population level should be stressed even stronger than before.

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Résumé

La mortalité, standardisée selon l'âge, a été calculée en Belgique (B) et aux Pays-Bas (PB) à partir de la mortalité spécifique par groupe d'âges de cinq ans, entre 45-74 et 75-85+ ans. Les données de mortalité étaient disponibles de 1954 à 1991 ou 1994 (selon la cause de mort) et aux PB de 1950 à 1993. La mortalité par toutes causes observée en B pour le groupe d'âges de 45-74 ans a diminué entre 1955 et 1992 de 33% chez l'homme et de 48% chez la femme. Aux PB on trouva respectivement 11% et 40%. Pour le groupe d'âges de 75-85+ ans on trouva respectivement 21% et 37% en B, et 4% et 36% aux PB. Depuis 1980 jusqu'à la dernière année disponible on observa en B une importante baisse de la mortalité, tant chez l'homme que chez la femme et aucun changement aux PB. La mortalité la plus élevée était toujours observée en Wallonie, suivie de la B, la Flandre et les PB. Récemment la mortalité observée en Flandre était plus faible qu'aux PB.

Les tendances de la mortalité calculées depuis 1980 étaient obtenues par 11 causes de mortalité chez l'homme et 13 chez la femme. Entre 48 comparaisons possibles, 38 (79%) étaient favorables à la B, 9 aux PB et 1 ex aequo.

L'espérance de vie des 15 pays de l'Union Européenne a été comparée en 1992. La B était huitième, les PB troisième. La différence entre les deux pays était de 3 ans en 1967 et de un an en 1992. La Flandre, substituée à la B, se classait cinquième (0,3 ans de moins que les PB) et la Wallonie quatorzième (2,2 ans de moins). Entre 1967 et 1992 les meilleurs résultats, au point de vue espérance de vie, étaient observés au Portugal, tandis que le Denmark avait les plus mauvais résultats.

Les changements observés depuis 1960 en B et aux PB au point de vue style de vie — graisses, sel, fruits et légumes et tabac — sont en relation avec les variations observées de la mortalité et de l'espérance de vie. La médecine curative et les progrès en technologie médicale ne peuvent expliquer ces observations.

Samenvatting

Leeftijd-gestandaardiseerde sterfte in België (B) en Nederland (NL) werd berekend uit 5 jaarlijkse leeftijd-specifieke sterfte tussen leeftijd 45-74 en 75-85+ jaar. Sterftegegevens waren beschikbaar in België vanaf 1954 tot 1991 of 1994, naargelang de doodsoorzaak, en vanaf 1950 tot 1993 in Nederland. Sterfte door alle oorzaken in de 45-74 leeftijdsklasse daalde in België tussen 1955 en 1992 met 33% bij de man en 48% bij de vrouw. In NL was dit respectievelijk 11% en 40%. In de leeftijdsklasse 75-85+ was dit respectievelijk 21% en 37% in B, en 4% en 36% in NL. Een zeer belangrijke daling van de algemene sterfte sinds 1980 werd geobserveerd in B in de leeftijdsklasse 75-85+ jaar, in NL werd geen significante verandering waargenomen. Wallonië had steeds de

hoogste sterfte, gevolgd door B, Vlaanderen en NL. Maar recent werd de sterfte in Vlaanderen de laagste.

Sterftetrends, in beide leeftijdsklassen en geslachten, werden berekend tussen 1980 en het laatste beschikbare jaar voor 11 doodsoorzaken bij de man en 13 bij de vrouw. Uit 48 mogelijke vergelijkingen waren 38 (79%) in het voordeel van B, 9 in het voordeel van NL en 1 ex aequo.

Levensverwachting in 1992 werd vergeleken in de 15 E.U. landen. Voor beide geslachten tezamen kwam B op de 8ste plaats, NL op de 3de. Het verschil in levensverwachting tussen beide landen was 3 jaar in 1967 en 1 jaar in 1992. Vlaanderen kwam op de 5e plaats (0,3 jaar minder dan NL) en Wallonië was 14de (2,2 jaar minder) indien ze in de plaats van België kwamen tussen de E.U. landen. Portugal had het beste en Denemarken had het slechtste resultaat tussen 1967 en 1992.

Verandering in levensstijl — vet, zout, fruit- en groenteninname en rookgewoonten — welke in beide landen, alsook in Vlaanderen en Wallonië, sinds 1960 plaats vonden zijn consistent met de veranderingen in sterfte en levensverwachting. Curatieve geneeskunde en medische technologie kunnen de geobserveerde verschillen en trends niet verklaren.

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