Population and social conditions

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Circulatory diseases - Main causes of death for persons aged 65 and more in Europe, 2009

For people of 65 years and older (65+), the main causes of death are circulatory diseases, such as ischaemic heart diseases and cerebrovascular diseases, followed by cancers. For those of less than 65 years there is a difference by gender: for men circulatory diseases prevail, while women die almost twice as often from cancers than from circulatory diseases.

National and regional distributions of causes of death in people of 65+ indicate the following:

- Circulatory diseases – eastern European countries have the highest death rates

Causes of death (COD) among the over-65 age-group are of increasing significance in European mortality statistics. A dramatic change in the nature of health care over the past century has resulted in longer life spans, but also greater prevalence of chronic illnesses. This has increased the demands on the health care system, particularly for the treatment of ongoing illnesses and for long-term care. In addition, public

- Respiratory diseases there is a heterogeneous distribution for this complex group of causes of death
- Lung cancer this disease has the highest gender difference among the main causes of death, as it accounts for four times as many deaths in men as in women
- Colorectal cancer there are no striking regional or gender differences
- Breast and prostate cancer death rates show a considerable decrease over time

health programmes throughout Europe are largely aimed at the reduction of mortality before the age of 65 by preventive measures. They promote a healthier life style with improved nutrition, lower tobacco and alcohol consumption, an increase in physical activity and reduction of professional risks. In 2009 more than 3.8 million deaths in the EU-27 occurred after the age of 65, 80.3 % of total deaths.



Figure 1: Major causes of death for persons under 65 years and aged 65 and more – standardised death rates (SDR) per 100 000 inhabitants, EU-27, 2009

Source: Eurostat (online data code: <u>hlth_cd_asdr</u>)



The percentage of the population aged 65+ in the EU-27 is projected on average to increase from 16.0% in 2010 to 29.0 % in 2060 (see: The greying of the baby boomers. SIF: <u>KS-SF-11-023</u>).

It is therefore interesting to focus on the major causes of death for that age group.

This publication addresses seven major COD for persons aged 65+: 2 main disease groups of the circulatory system, ischaemic heart diseases (such as heart attacks) and cerebrovascular diseases (such as strokes); the group of respiratory diseases, and 4 malignant neoplasms: lung cancer¹, colorectal, breast and prostate cancer. Between 2000 and 2009 there was a reduction of 26% in EU-27 death rates resulting from ischaemic heart diseases and cerebrovascular diseases. Nevertheless, as shown in figure 1, for people of 65+ these circulatory diseases are still the main causes of death. For those of less than 65 years the situation is different: while for men there is still a slight predominance of deaths by circulatory diseases (ratio 1.2), women die almost twice as often from lung, colorectal and breast cancers than from circulatory diseases.

¹Including neoplasm in larynx, trachea, bronchus and lung

Gender differences in people of 65+ highest for lung cancer

Going into gender differences for the seven COD studied, the main difference between men and women is for lung cancer. For ages 65+ the ratio of Standardised Death Rates (SDR) for men to women is 5.0 in the year 2000, falling to 3.8 in 2009, see figure 2. It reflects a definite trend over time: while for women of both age groups the EU-27 SDR goes up from 8.3 to 10.2 (ages less than 65) and from 81.1 to 92.4 (ages 65+), respectively, the trend for men is the reverse, from 33.1 to 27.3 for the younger and from 402.7 to 352.1 for the older age groups.





National differences in causes of death for the elderly in EU-27

For the EU-27 the SDR for people of 65+ is highest for ischaemic heart diseases with 568.8 per 100 000 inhabitants, followed by cerebrovascular diseases (397.4), respiratory diseases (326.0) and lung cancer (201.2).

However, only 13 countries are strictly in line with that pattern. For six countries cerebrovascular diseases rank first among COD (BG, EL, LU, PT, SI and MK). Four countries reported respiratory diseases in first (BE, DK, ES and NL) and 10 other countries in second place (DE, EL, IE, FR, CY, LU, PT, UK, IS and NO), while two countries do not report respiratory diseases at all as one of the four main COD: here the third major COD is lung cancer and the fourth major COD is colorectal cancer (EE, LV). PT is the only country where lung cancer is not among the four major COD.

The findings indicate a skew for circulatory diseases towards eastern Europe. SDR of more than 900 per 100 000 inhabitants were reported for ischaemic heart diseases by CZ, EE, FI, LT, LV, MT, HU, SK, RO and HR (with highest of more than 2 000 by LT and SK), and for cerebrovascular diseases by BG, LV, RO and MK. On the other hand only two countries have a SDR of less than 300, FR for both disease groups and CH for cerebrovascular diseases, see maps 1 and 2.

-	Ischaemic heart	Cerebrovascular	Respiratory	Lung cancer	Colorectal	Breast cancer	Prostate cancer
Country	disease (total)	diseases (total)	diseases (total)	(total)	cancer (total)	(females)	(males)
EU27	568.8	397.4	326.0	201.2	120.4	102.4	167.3
EU15	463.7	316.7	334.4	197.2	114.3	104.1	166.2
BE	480.7	340.0	541.6	244.8	121.9	124.1	190.1
BG	755.6	1 310.2	204.8	137.7	126.8	87.5	133.8
CZ	1 308.3	640.4	299.3	219.8	173.4	102.1	186.0
DK	453.2	315.1	524.1	290.0	157.8	151.8	267.6
DE	632.5	297.3	299.8	178.9	117.4	112.7	162.5
EE	1 535.9	485.2	129.2	188.1	133.9	92.2	301.6
IE	759.0	324.2	583.0	247.4	132.5	133.6	220.7
EL	379.3	611.2	416.1	211.6	85.6	103.7	141.5
ES	317.7	284.7	395.9	180.0	128.6	74.0	139.9
FR	235.8	208.0	209.8	165.2	107.9	103.5	169.3
IT	455.1	388.7	232.3	209.1	110.8	103.7	129.4
CY	458.4	301.4	311.7	144.5	64.2	88.4	143.3
LV	1 734.0	977.5	86.2	182.2	136.5	91.6	262.7
LT	2 250.2	895.8	197.9	178.1	142.3	93.1	241.1
LU	314.2	376.9	331.6	222.7	138.4	123.5	202.3
HU	1 523.9	666.4	273.3	273.9	207.1	117.0	171.0
MT	905.0	485.7	428.6	177.4	113.7	142.1	122.4
NL	306.1	266.9	426.3	267.8	135.8	119.5	207.8
AT	749.4	263.2	216.2	160.8	105.6	113.8	174.3
PL	660.3	516.4	287.3	260.9	139.0	82.9	177.5
PT	304.7	598.4	510.9	119.7	138.5	79.3	195.0
RO	1 317.7	1 276.5	260.9	169.5	114.7	88.8	122.9
SI	444.9	531.2	318.0	204.2	171.7	134.3	281.8
SK	2 072.4	715.0	338.1	188.7	181.9	100.9	186.2
FI	934.0	354.0	178.5	155.8	86.9	83.8	188.9
SE	639.0	325.7	239.1	155.0	113.7	84.0	271.3
UK	569.6	343.8	539.6	256.1	109.3	113.1	196.1
IS	666.1	302.6	339.1	238.6	116.5	115.5	259.3
NO	492.2	310.9	391.1	199.5	144.0	90.4	277.5
СН	506.3	233.7	215.4	161.1	96.1	106.5	205.9
HR	1 183.6	897.8	252.3	233.5	186.9	127.6	236.5
MK	564.8	1 442.9	240.4	186.6	113.4	103.1	138.2

Table 1: Major causes of death at national level for 65+ years, SDR per $100\ 000$ inhabitants, 2009

BE: 2005; CH: 2007; FR, IT: 2008

Source: Eurostat (online data code: hlth_cd_asdr)

Regional differences in EU-27 for causes of death (COD) in the elderly

The following maps show differences for the aforementioned COD at regional level (NUTS 2 regions) for the reference years 2006-2008. SDR for men and women were combined into one map if there

was no apparent difference in the geographical pattern, even though the ratio between men and women may vary.

Cerebrovascular and ischaemic heart diseases: Highest COD rates in East-European regions

For both groups of circulatory diseases the geographical distribution of SDR for people of 65+ is similar, with highest rates for eastern European countries.

For cerebrovascular diseases highest SDR of more than 1 000 per 100 000 inhabitants are found in 16 regions of BG, LV, RO and MK, while 31 regions of AT, DE, ES, FR and CH reported lowest rates of less than 250 per 100 000 inhabitants. The distributions for men and women are similar in regions with the highest SDR, such as in regions of BG and RO. However, only 18 regions reported rates of less than 250 deaths per 100 000 inhabitants for men, compared to 42 regions for women (data not shown; for details see Eurostat database).



Map 1: Deaths due to cerebrovascular diseases in people aged 65 years and more

(¹) MT, UK, CH 2005/2007; BE, 2000/2002; Scotland NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

For ischaemic heart diseases the highest SDR (more than 1 500 per 100 000 inhabitants) are reported from 17 regions of the Baltic countries, CZ, HU, SK and RO. The regions with lowest rates (less than 250 per 100 000 inhabitants) are in the south-west of Europe: 13 in FR, 2 in PT and one in ES.

The difference in distribution of the highest and lowest rates for men and women is more pronounced than for cerebrovascular diseases: for men, 27 regions report a SDR of more than 1 500 per 100 000 inhabitants, with 4 regions having rates higher than 2 500 in LT, LV and SK. Lowest SDR of less than 250 per 100 000 inhabitants are found in 3 regions of FR. On the other hand, for women only 10 regions in HU, LT, LV, RO and SK have a SDR of more than 1 500 per 100 000 inhabitants, with highest rate of 2 064 per 100 000 in LT. However, by contrast with the situation for men, 45 regions (11 from ES, 4 from EL, 25 from FR, 2 from PT and 3 from NL) report a SDR of less than 250 per 100 000, with the lowest for Guyane (FR, SDR 77.7).





(¹) MT, UK, CH 2005/2007; BE, 2000/2002; Scotland NUTS1 level; DK, SI, HR national level. Source: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

Respiratory diseases: A heterogeneous regional distribution for a complex group of diseases

For respiratory diseases, which include chronic lower respiratory diseases or asthma as well as infectious diseases such as influenza or pneumonia, there are some countries with a relatively high SDR for people of 65+ such as DK, IE, PT or UK, which can be clearly differentiated from those with lower SDR such as the Baltic countries, FI and most parts of FR. However, the regional distribution of death rates within the countries for respiratory diseases is quite heterogeneous, but has a much smaller range than for circulatory diseases: the highest SDR was reported by Regiao Autonoma de Madeira (PT) with 1 137 per 100 000 inhabitants, followed by 10 UK regions with rates between 760 and 650 per 100 000. On the other hand 7 regions in EE, FI, FR and LV had a rate of 180 per 100 000 and below, with the very lowest of 117.6 for LV.

The relation of SDR for men and women varies from almost 1:1 in IS to ratios above 4.0 for the Baltic countries, the highest being for LT with 4.5. The range differs also within the countries, from 1.3 to 1.5 in the UK to 1.6-2.8 in FR, 1.7-2.7 in DE or 2.2-3.8 in PL.



Map 3: Deaths due to diseases of the respiratory system in people aged 65 years and more

(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland NUTS1 level; DK, HR, national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

The scattered picture for this complex group of causes of death may partly indicate differences in reporting and coding practices, which may be less relevant for other diseases. In general death certificates for the elderly are complicated due to several co-morbidities, with respiratory diseases often playing an important role. Additional reasons may include differences in environmental conditions including specific work conditions for men, differences in public health campaigns that may not reach all of the elderly, such as vaccinations against influenza, or differences in reaching for a doctor in rural areas for pneumonia complications in the elderly.

Colorectal cancer: No striking regional or gender differences

SDR for men and women were combined into one map as there is no obvious difference in the geographical pattern nor in the ratio for men and women.

At present colorectal cancer ranks second for malignant neoplasms affecting both women and men, following lung cancer. There is an appreciable downward trend in most of the countries, with slightly more improvement for rectum and anus cancer, but it remains one of the major scourges for the elderly. There seems to be a geographic slope from northern and central European countries to the south: highest SDR with more than 200 deaths per 100 000 can be noted in CZ, HU and SK. On the other hand SDR with less than 60 per 100 000 inhabitants were reported by FI, EL, and FR, with the lowest rate at 47.4 for Ipeiros (EL). Low figures for the Mediterranean regions of FR, the whole of EL, MT and part of IT contrast to higher rates for Mediterranean regions of ES, while low rates are also found in 3 regions of FI with less than 73 cases per 100 000.



Map 4: Deaths due to colorectal cancer in people aged 65 years and more

(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland, NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

Lung cancer: A marked gender difference at national and regional level

The fact that rates for lung cancer are much higher for men than for women in the ages 65+ has

already been mentioned above. This is underlined by regional data as shown by the two maps.





(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>) Map 6: Deaths due to larynx, trachea, bronchus and lung cancer in women aged 65 years and more



(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code : <u>hlth_cd_ysdr1</u>)

In 11 out of 32 European countries covered by the data the SDR for lung cancer is 6 or more times higher for men of 65+ than for women, with MT having the highest ratio at 12.6. However, for those less than 65 years almost all countries report a shrinking gender difference: only 4 countries have ratios of 6 and higher, the highest being for LV at almost 12 times more for men than for women.

For people of 65+ maps 5 and 6 indicate highest SDR for men in eastern and south-western Europe plus northern UK on the one hand and an incline from north-east to south-west for women on the other hand. That difference in SDR for women is also reflected in the ratios men to women, which are highest with 9 and more for regions in EL, ES, FR, IT and PT, but also in LT, while ratios of 2 down to 1 are found in DE, IE, IS, NO, SE, and the UK.

Breast and Prostate Cancer: A noticeable decrease over time

After the diseases already mentioned breast and prostate cancer are the major COD for women and men, respectively.

Breast cancer seems to be closely linked to the genetic make-up, but also to the reproduction history of women, which may include hormone replacement therapy. The trend over time for the EU-27 from 2000

to 2009 indicates a noticeable reduction from 109.8 to 102.4 SDR per 100 000 women at the ages of 65+. High numbers of cases follow a line from north-west to south-east of Europe, with SDR from equal and higher than 130 per 100 000 for women in regions from IE, UK, BE, NL, DK and DE south to HU and RO, with highest SDR of 151.5 for DK.





(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland, NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

Prostate cancer is a significant cause of death for elderly men, with still uncertain aetiology. Age seems to be the most relevant risk factor for developing prostate cancer, which is increasingly found as part of a multiple cause development towards death in an ageing population.

At national level the trend over time indicates a clear decline for the EU-27 from a SDR of 201.3 in the year 2000 to 167.3 deaths per 100 000 men in 2009. The only countries that reported reverse trends are CY, LV, LT, PL, RO, SI and MK.

In view of the geographical distribution of SDR across Europe there seems to be a slope from north to

south with higher levels in the northern parts: while regions of the Baltic countries, IS, NO and SE reported SDR of more than 270 per 100 000 men, southern countries such as MT, MK and RO have rates of less than 120 per 100 000. However, a closer look at regional data indicates a more heterogeneous picture: Peak data of more than 270 per 100 000 men were reported not only from FI, LT, LV, NO and SE but also from PT and SI (plus FR overseas with the highest SDR of 403.2 from Martinique) On the other hand, low figures came indeed from BG, EL, ES, IT, FR, MK, and RO, the lowest being for Sud-Vest Oltenia (RO) with an SDR of 74.0.





(¹) MT, UK, CH 2005/2007; BE 2000/2002; Scotland, NUTS1 level; DK, SI, HR national level. *Source*: Eurostat (online data code: <u>hlth_cd_ysdr1</u>)

METHODOLOGICAL NOTES

The causes and groups of medical causes of death chosen have been selected from the summary list of 65 causes compiled by Eurostat, which is based on the International Statistical Classification of Diseases and Related Health Problems (ICD) developed and maintained by the World Health Organisation (WHO). Causes of death statistics are based on information derived from medical certificates; the medical certification of death is an obligation in all Member States. They target the underlying cause of death, in other words, the disease or injury which initiated the train of morbid events leading directly to death. Although definitions are harmonised amongst Member States, the statistics may not be fully comparable as classifications may vary when the cause of death is multiple or difficult to evaluate and because of different notification procedures. Annual data are provided in absolute numbers, as crude death rates and as standardised death rates.

The spatial analysis scale used in this publication is the **regional** level. The data have been aggregated over the period 2006-2008, with the exception of some countries for which these years data were missing: Malta, United Kingdom and Switzerland (2005-2007) and the Flemish part of Belgium (2000-2002). That aggregation was done in order to increase the number of deaths, thereby reducing the number of regions with numbers too small for statistical processing.

The mortality indicator analysed in this "Statistics in Focus" is the **standardised rate (SDR)**. The (age-) standardised death rate is a weighted average of age-specific mortality rates. The weighting factor is the age distribution of a standard reference population. The standard reference population used is the European standard population as defined by the WHO. As method for standardisation, the direct method is applied. Standardised death rates are calculated for the age group 0-64 ('premature death'), 65 years and more and for the total of ages. As most causes of death vary significantly with people's age and sex, the use of standardised death rates improves comparability over time and between countries.

$$SDR_A = \frac{\sum_{x} \left({^A m_x {^S P_x}} \right)}{\sum_{x} {^S P_x}}$$
, where

Further information

 SDR_A = age standardised death rate for population in region A

 ${}^{A}m_{x}$ = age specific death rate at age *x* last birthday in population in region *A*

 ${}^{S} P_{x}$ = the population exposed to the risk of death at age *x* last birth day in the standard population

The indicator Male/Female ratio was also used to compare the differences in mortality between men and women according to country.

$$RMF = \frac{SDR - M}{SDR - F}$$
 , where

RMF = male/female mortality rate

 SDR_M = male comparative rate

 SDR_F = female comparative rate

List of codes used for the Member States, accession, candidate and EFTA countries: Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Greece (EL), Spain (ES), France (FR), Ireland (IE), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE), United Kingdom (UK), Croatia (HR), former Yugoslav Republic of Macedonia (MK), Iceland (IS), Norway (NO), Switzerland (CH).

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Eurostat Website: <u>http://ec.europa.eu/eurostat</u> Data on 'Health statistics' <u>http://epp.eurostat.ec.europa.eu/portal/page/portal/health/public_health/data_public_health/database</u> Select 'Causes of death' Further information about 'Health statistics' http://epp.eurostat.ec.europa.eu/portal/page/portal/health/introduction

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