



1.5. Avoidable mortality: amenable mortality (QE-8) & preventable mortality (QE-9)

Description	<p>This sheet describes the two sub-indicators constituting the “avoidable mortality”:</p> <ol style="list-style-type: none">1. The amenable mortality2. The preventable mortality <p>The concept of avoidable mortality ⁽¹⁾ is based on the idea that certain deaths (for specific age groups and according to specific causes of death) could be 'avoided' or that their number could be reduced, if there had been more effective medical and public health interventions in place.</p> <ul style="list-style-type: none">• A death is said amenable if, in the light of medical knowledge at the time of death, all or most deaths from that cause could have been avoided through good quality health care. Deaths from appendicitis, pneumonia, peptic ulcer are three examples of cause of death that are said to be amenable.• A death is said preventable if, in the light of understanding the determinants of health at the time of death, it could have been avoided by public health policies focusing on wider determinants of public health, such as lifestyles, socioeconomic status and environmental factors. Deaths from road accident, lung cancer, alcohol-related diseases are three examples of deaths that are said to be preventable. <p>These two types of avoidable mortality are not mutually exclusive: some causes of death are considered to be both amenable <u>and</u> preventable: for instance, tuberculosis or breast cancer are causes of death considered to be both amenable and preventable. Although avoidable mortality almost exclusively refers to deaths occurring below 75 year (excepted for accidents), it differs from premature mortality since it only includes causes that could potentially be avoided by appropriate health care or policies.</p>
Calculation	<p>Number of cases: Avoidable deaths are all those defined as preventable or amenable (or both), where each death is counted once. Where a cause of death falls within both subcategories (amenable and preventable), all causes of deaths from that cause are counted in both subcategories when they are presented separately. Due to the overlap between the subcategories, the avoidable death cannot be computed by summing up the subcategories amenable and preventable deaths.</p> <p>Age-specific rates (by direct standardisation method) are then calculated by dividing the number of case in each age-group by the population of the same age-group. These age-specific rates are weighted according to the chosen standard population, then summed up and divided by the total standard population to obtain age-standardized rates, that allow for regional or between countries comparisons.</p> <p>The “potential years of life lost” indicator (PYLL) measures the number of years of life that have been lost due to a premature death. PYLL weights the deaths occurring at younger age groups more heavily than the ones occurring in older people. The calculation of PYLL involves summing up deaths occurring at each age and multiplying this with the number of remaining years to live up to a selected age limit (here, 75 years). Age-standardized PYLL rates are calculated the same way as age-standardized rates. It has to be noted that this indicator puts a huge weight on newborns' deaths, which leads many authors to calculate them from 1 year of age.</p>
Rationale	<p>In the framework of HSPA, the all-cause premature mortality is not a specific outcome, because many other factors than the health system influence the premature mortality rate. There was a need for an indicator that might be more legitimately attributed to health care intervention.</p> <p>The <u>amenable mortality</u> is an aggregated indicator pooling the causes of premature deaths that are supposed to be influenced by the health care system; as such, it is supposed to be an indicator of the health system's effectiveness.</p>



	<p>The preventable mortality is an aggregated indicator pooling the causes of premature deaths that are supposed to be influenced by public health policies; as such, it is supposed to be an indicator of (late) health promotion outcomes.</p> <p>There is a quite large overlap between the subcategories of avoidable mortality, meaning that many causes of deaths are considered to be both amenable and preventable.</p>
Primary data source	Statistics Belgium, causes of deaths (COD) database
Indicator source	<p>For Belgium: own calculations (based on Statistics Belgium COD database)</p> <p>For international comparisons : Eurostat of EU Commission</p> <p>This can lead to slightly different results in national calculations versus the Belgian results in the EU calculations</p>
Technical definitions	<p>Since the introduction of the concept in the 80ths, many lists of causes for so called “avoidable deaths” have been proposed, none of them having reached a consensus. The EU adopted since 2013 the list of the UK Office National of Statistics⁽¹⁾, which more or less pooled the list of Nolte and the one of Tobias ^(2,3). We used this current EU/ONS-UK list in the present report. However it is now already under revision.</p> <p>In the current EU/ONS-UK definition, for most causes, the upper age limit is 75 years. For external causes of deaths, there is no upper age limit. However, for technical reasons, calculations made at BE level were all made on deaths occurring below 75 years (also for external cause of deaths). This leads to a small underestimation of the number of preventable deaths, but has very little impact on the rate. At EU level, cross-countries comparisons include all ages for external causes of deaths.</p>
Limitations	<p>The choice of the causes, and moreover the attribution of the causes to a category (amenable, preventable, or both) is sometimes discussable. Indeed, the list is currently under revision.</p> <p>Amenable mortality:</p> <ul style="list-style-type: none"> • The validity of the amenable mortality to measure the health system performance assessment has not yet been demonstrated ⁽⁴⁾. Nolte points out that “it was never intended to be more than an indicator of potential weaknesses in health care that can be investigated more in depth. It was not intended to be a source of evidence in differences in effectiveness in health care”⁽²⁾, meaning that this indicator is probably used to tell more than it actually can do. • It is an aggregate measure that provides only global information, but does not indicate what is to be addressed when there is evidence of suboptimal quality. This needs a more in-depth analysis (including a cause-specific mortality analysis and a qualitative assessment of the process)⁽⁵⁾. • The amenable mortality indicator does not take into account all the benefits of the health care interventions that are not only preventing death but meanwhile improving the quality of life. <p>Preventable mortality: the same limitation as for amenable mortality with respect to the aggregated nature of the indicator can be made for preventable mortality.</p>
International comparability	<p>Availability: yes (Eurostat)</p> <p>Validity: the validity of the comparison are hampered by (at least) two major causes:</p> <ol style="list-style-type: none"> 1. Differences between countries can be partly due to differences in certification and coding of the cause death; moreover there are important differences between the countries in the quality of coding. Countries with a large proportion of poorly determined causes of deaths will have consequently fewer specified causes of deaths, those latter only constituting the avoidable deaths. 2. The ‘amenable mortality’ does not account for differences in the underlying prevalence/incidence of the diseases.



1.5.1. List of available conditions

Office for National Statistics (ONS), UK, 2011

Condition group and cause	ICD-10 codes	Age	Amenable	Preventable
Infections				
Tuberculosis	A15-A19, B90	0-74	X	X
Selected invasive bacterial and protozoal infections	A38-A41, A46, A48.1, B50-B54, G00, G03, J02, L03	0-74	X	
Hepatitis C	B17.1, B18.2	0-74	X	X
HIV/AIDS	B20-B24	All	X	X
Neoplasms				
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	0-74		X
Malignant neoplasm of oesophagus	C15	0-74		X
Malignant neoplasm of stomach	C16	0-74		X
Malignant neoplasm of colon and rectum	C18-C21	0-74	X	X
Malignant neoplasm of liver	C22	0-74		X
Malignant neoplasm of trachea, bronchus and lung	C33-34	0-74		X
Malignant melanoma of skin	C43	0-74	X	X
Mesothelioma	C45	0-74		X
Malignant neoplasm of breast	C50	0-74	X	X
Malignant neoplasm of cervix uteri	C53	0-74	X	X
Malignant neoplasm of bladder	C67	0-74	X	
Malignant neoplasm of thyroid gland	C73	0-74	X	
Hodgkin's disease	C81	0-74	X	
Leukaemia	C91, C92.0	0-44	X	
Benign neoplasms	D10-D36	0-74	X	
Nutritional, endocrine and metabolic				
Diabetes mellitus	E10-E14	0-49	X	X



Drug use disorders				
Alcohol related diseases, excluding external causes	F10, G31.2, G62.1, I42.6, K29.2, K70, K73, K74 (excl. K74.3-K74.5), K86.0	0-74		X
Illicit drug use disorders	F11-F16, F18-F19	0-74		X
Epilepsy and status epilepticus	G40-G41	0-74	X	
Rheumatic and other valvular heart disease	I01-I09	0-74	X	
Hypertensive diseases	I10-I15	0-74	X	
Ischaemic heart disease	I20-I25	0-74	X	X
DVT with pulmonary embolism	I26, I80.1-I80.3, I80.9, I82.9	0-74		X
Cerebrovascular diseases	I60-I69	0-74	X	
Aortic aneurysm and dissection	I71	0-74		X
Influenza (including swine flu)	J09-J11	0-74	X	X
Pneumonia	J12-J18	0-74	X	
Chronic obstructive pulmonary disorder	J40-J44	0-74		X
Asthma	J45-J46	0-74	X	
Gastric and duodenal ulcer	K25-K28	0-74	X	
Acute abdomen, appendicitis, intestinal obstruction, cholecystitis/lithiasis, pancreatitis, hernia	K35-K38, K40-K46, K80-K83, K85, K86.1-K86.9, K91.5	0-74	X	
Nephritis and nephrosis	N00-N07, N17-N19, N25-N27	0-74	X	
Obstructive uropathy and prostatic hyperplasia	N13, N20-N21, N35, N40, N99.1	0-74	X	
Complications of perinatal period	P00-P96, A33	All	X	
Congenital malformations, deformations and chromosomal anomalies	Q00-Q99	0-74	X	
Transport Accidents	V01-V99	All		X
Accidental Injury	W00-X59	All		X
Suicide and self-inflicted injuries	X60-X84, Y10-Y34	All		X
Homicide/Assault	X85-Y09, U50.9	All		X
Misadventures to patients during surgical and medical care	Y60-Y69, Y83-Y84	All	X	X



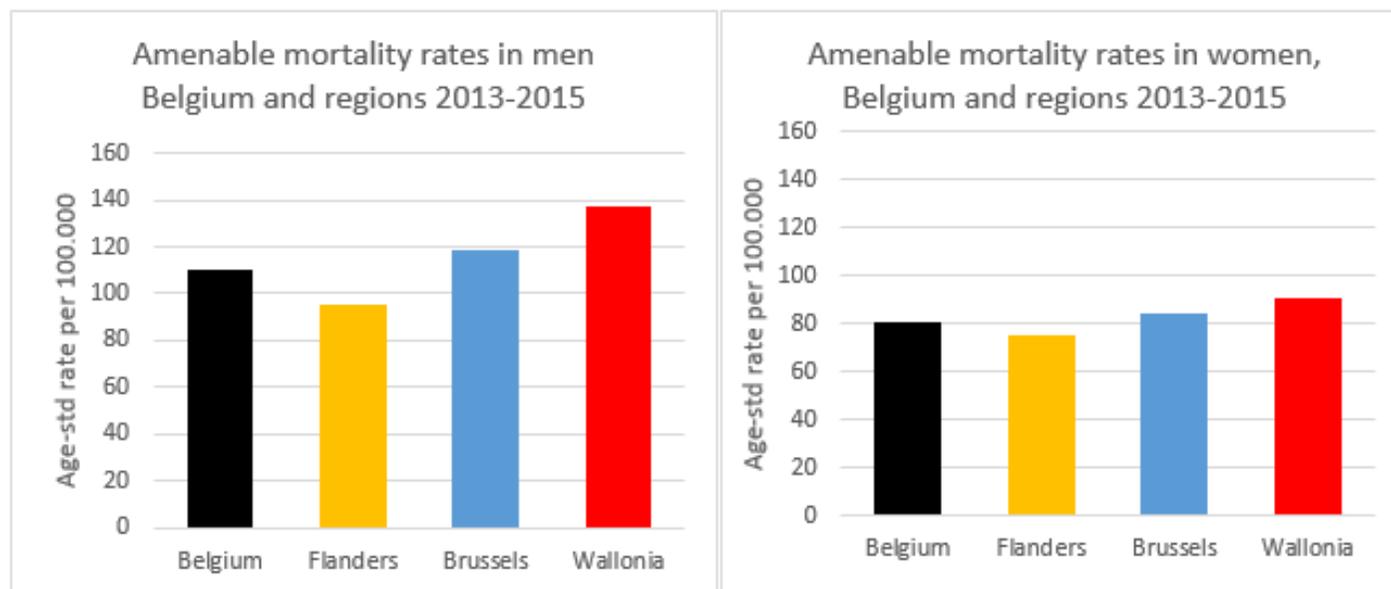
1.5.2. Amenable mortality

1. Rates by sex and region

The age-standardized amenable mortality rate (average 2013-2015) is higher in men than in women (sex ratio 1.37).

The amenable mortality is higher in Wallonia and in Brussels than in Flanders, and this difference in mortality is more pronounced in men. The sex ratio is more important in Wallonia, intermediate in Brussels and the lowest in Flanders.

2013-2015	Belgium	Flanders	Brussels	Wallonia	ratio BX/FL	ratio Wal/FL
Males	110.6	95.7	118.7	137.6	1.24	1.44
Females	81.0	75.4	84.3	90.7	1.12	1.20
Sex ratio	1.37	1.27	1.41	1.52		

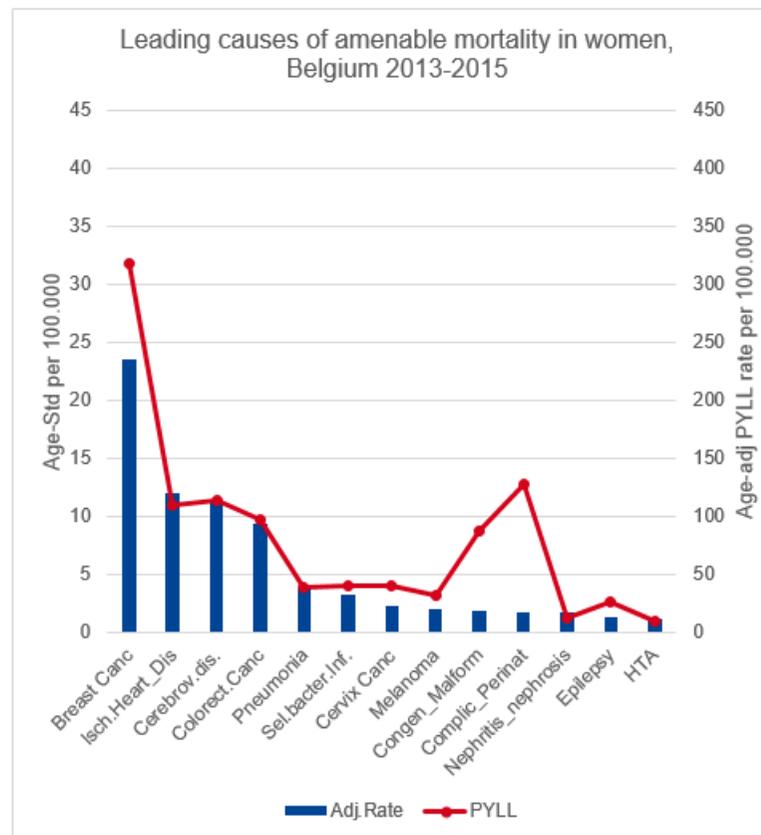
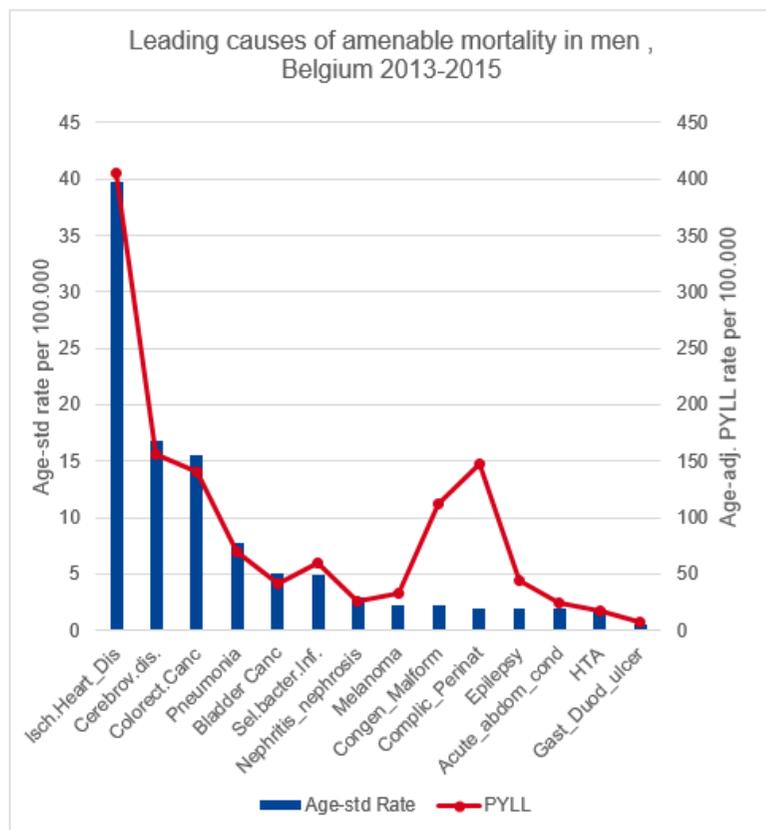


Source = author's calculation from Statbel causes of deaths database



2. Leading causes of amenable mortality

The leading causes of amenable deaths in men in 2013-2015 were: ischemic heart diseases, cerebrovascular diseases and colorectal cancer; in women it was breast cancer, ischemic heart diseases and cerebrovascular diseases.

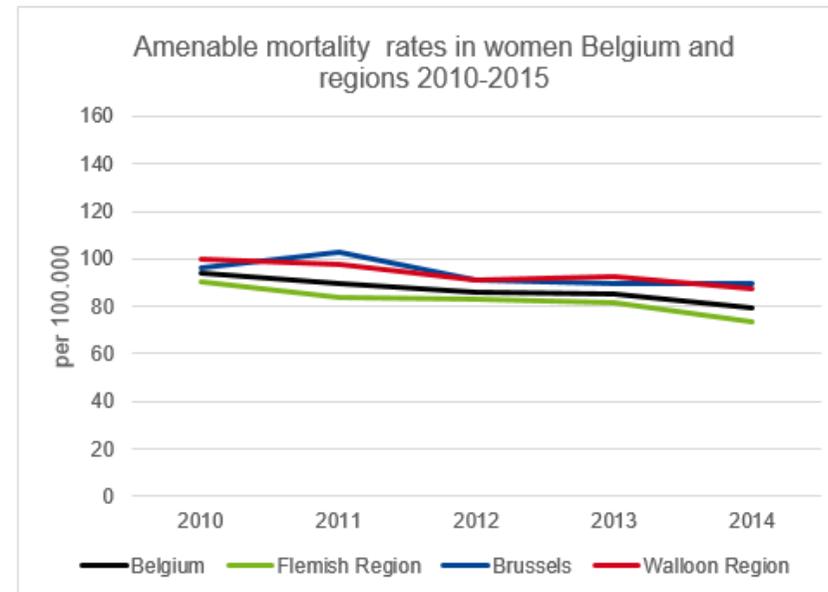
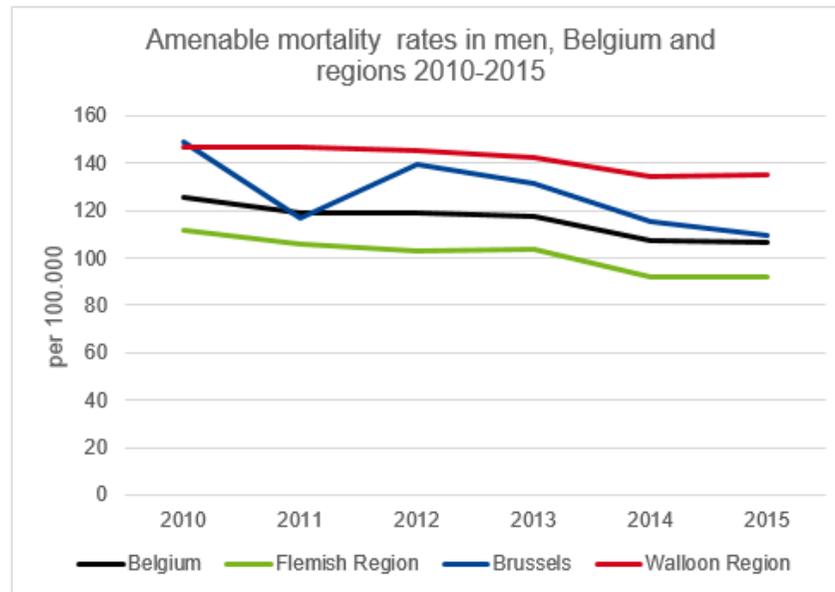


Source = author's calculation from Statbel causes of deaths database



3. Evolution by sex and region over time

The amenable mortality decreases in all regions and for both sexes. Some fluctuations are seen in Brussels, probably due to small numbers.

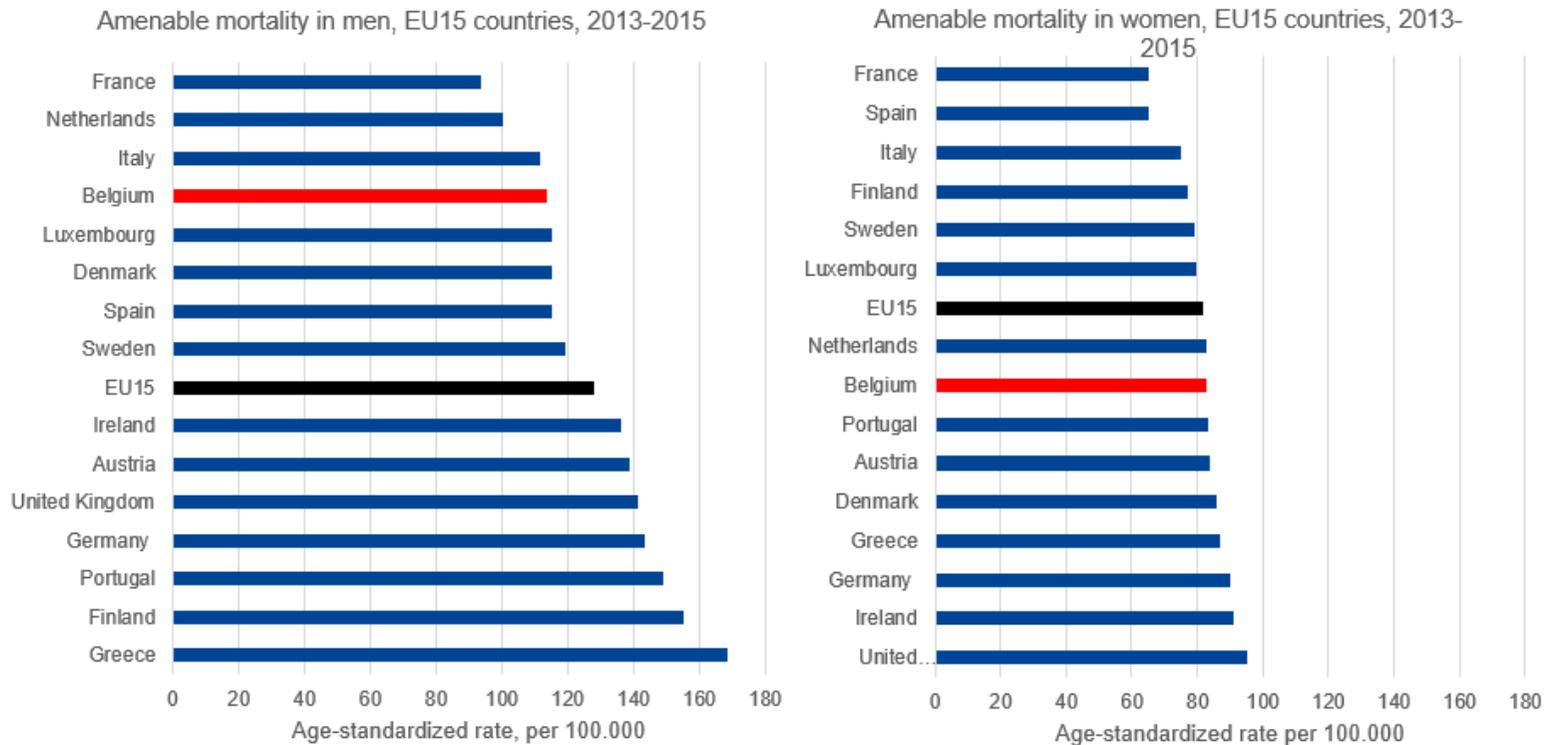


Source= author's calculation from Statbel causes of deaths database



4. European comparison, amenable mortality in EU 15 countries, 2013-2015

The amenable mortality is lower than the EU15 average in men but slightly higher in women.

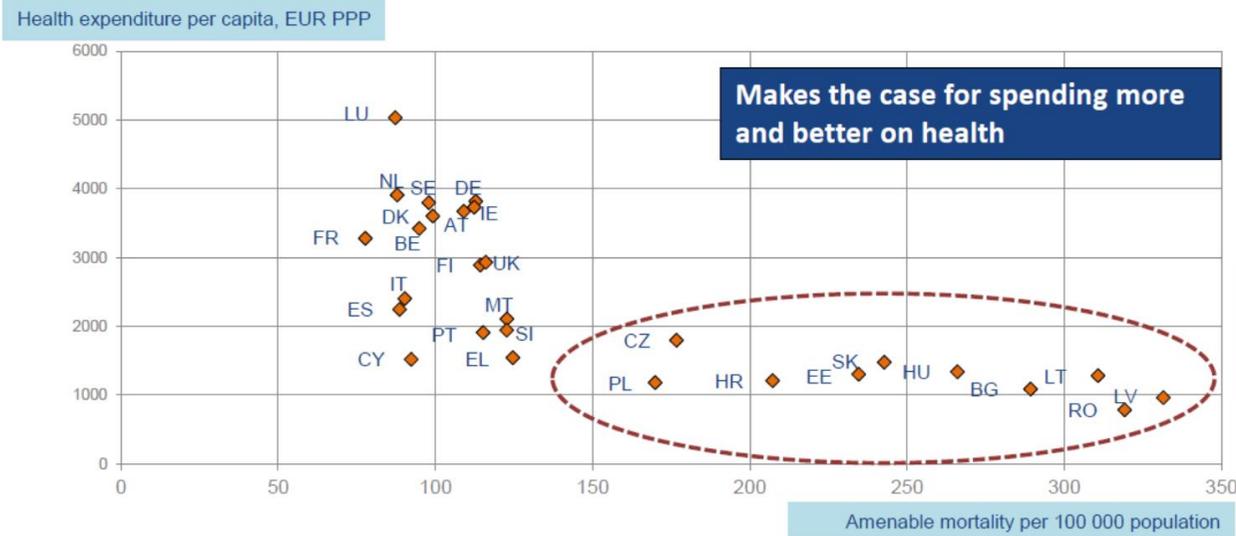


Source : Eurostat



A [report](#) from OECD and European Observatory of health system and policies stated that low spending countries for health expenditure per capita have much higher amenable mortality rates. This is mainly the case for countries of Eastern Europe. The situation of Belgium is shown on the following table. Belgium has relatively high health expenditure per capita. Comparing with the countries having the same level of amenable mortality (IT, ES, CY), the level of health expenditure is rather high.

Low spending countries **have much higher** amenable mortality rates



Note: Amenable mortality is defined as premature deaths that could have been avoided through timely and effective health care.
Source: OECD Health Statistics and Eurostat Database (data refer to 2014)



1.5.3. Preventable mortality

1. Rates by sex and region

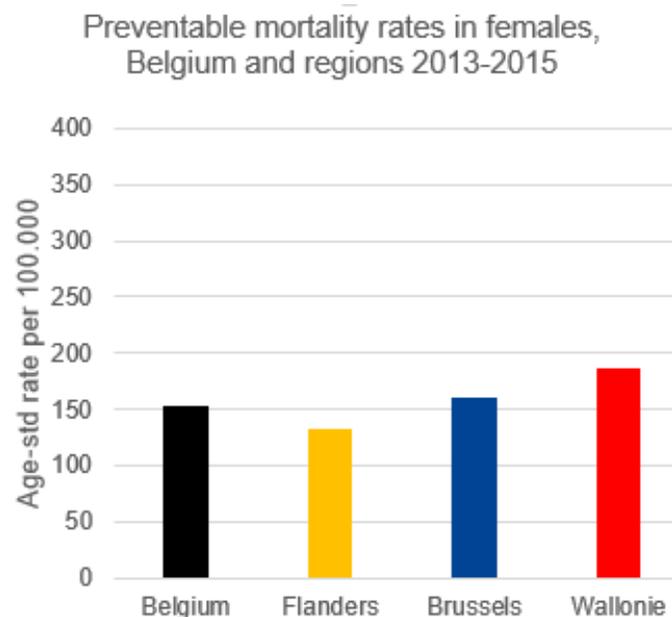
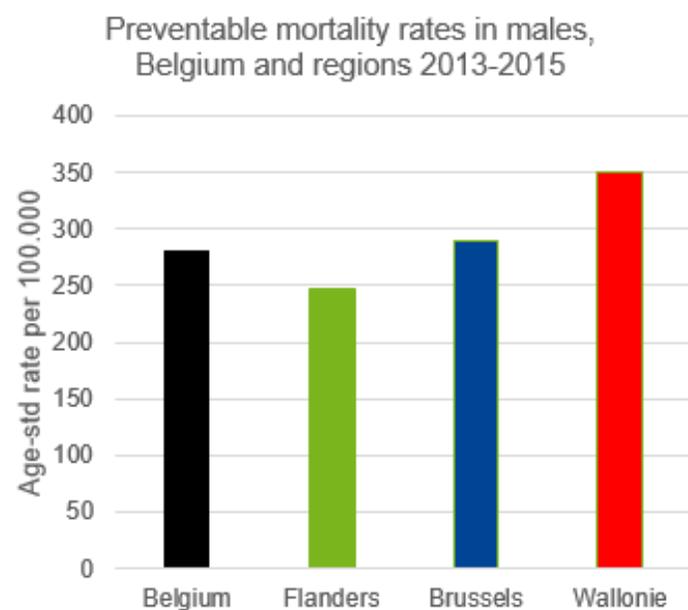
Note: the preventable mortality rates at Belgian and regional levels are calculated for deaths occurring below 75 (see metadata).

The age-standardized preventable mortality rate (average 2013-2015) is much higher in men than in women (sex ratio 1.8).

The preventable mortality is higher in Wallonia and in Brussels than in Flanders; the regional disparity is equal in both genders.

The sex ratio for preventable mortality the same in all regions.

	Belgium	Flanders	Brussels	Wallonia	ratio Bxl/Fla	ratio Wal/Fla
Men	281.4	246.3	288.5	349.6	1.17	1.42
Women	152.4	132.7	161.3	186.7	1.21	1.41
Sex ratio	1.8	1.9	1.8	1.9		



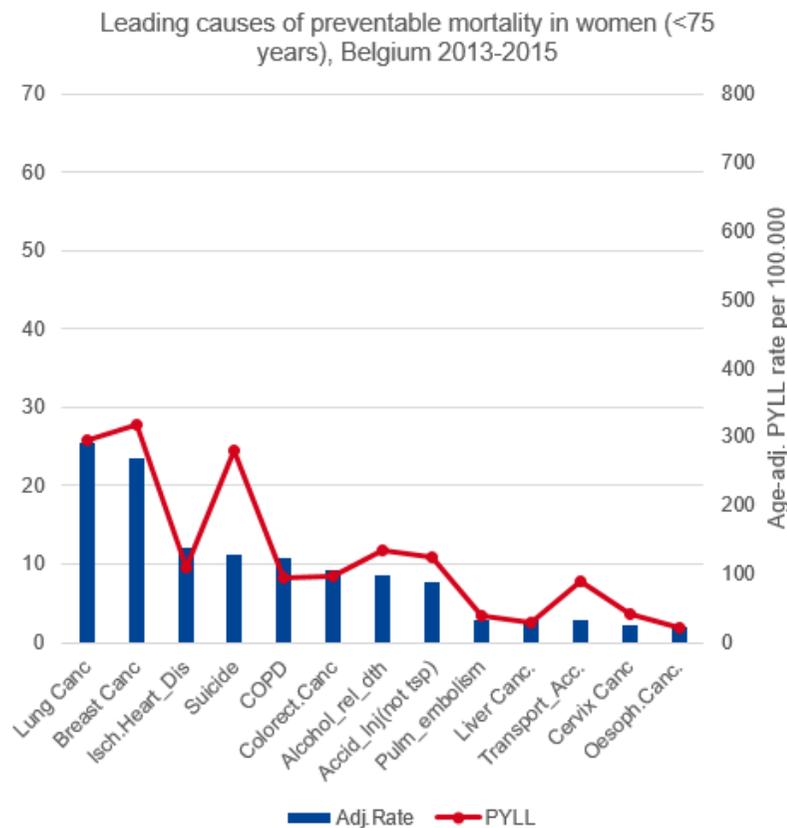
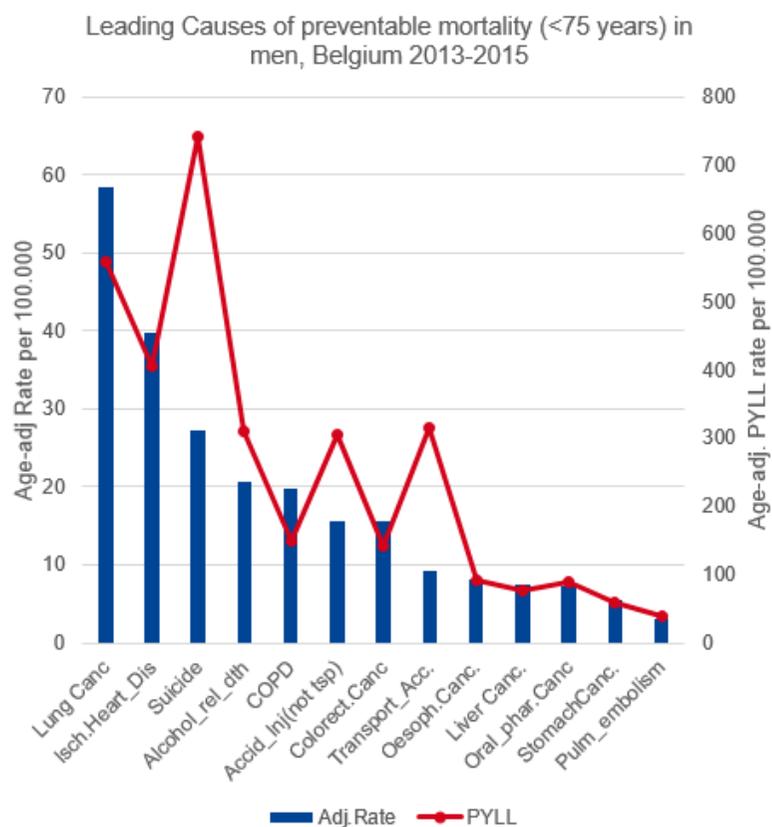
Source = author's calculation from Statbel causes of deaths database



2. Leading causes of preventable mortality

The leading causes of preventable mortality in men (before 75 years) are lung cancer, ischemic heart disease and suicide. If we look at the number of potential years of life lost (PYLL), then suicide is the leading cause, since it occurs more frequently at younger age than lung cancer or ischemic heart disease deaths.

In women (below 75), the leading causes of preventable deaths are lung cancer, breast cancer and ischemic heart disease. The PYLL in women are highest for breast cancer, lung cancer and suicide.

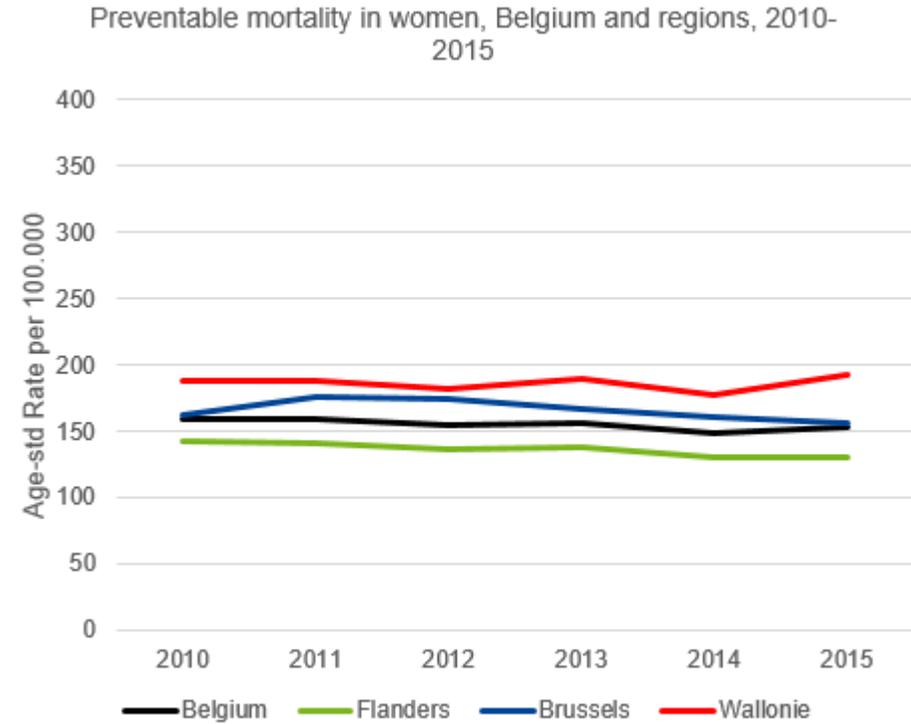
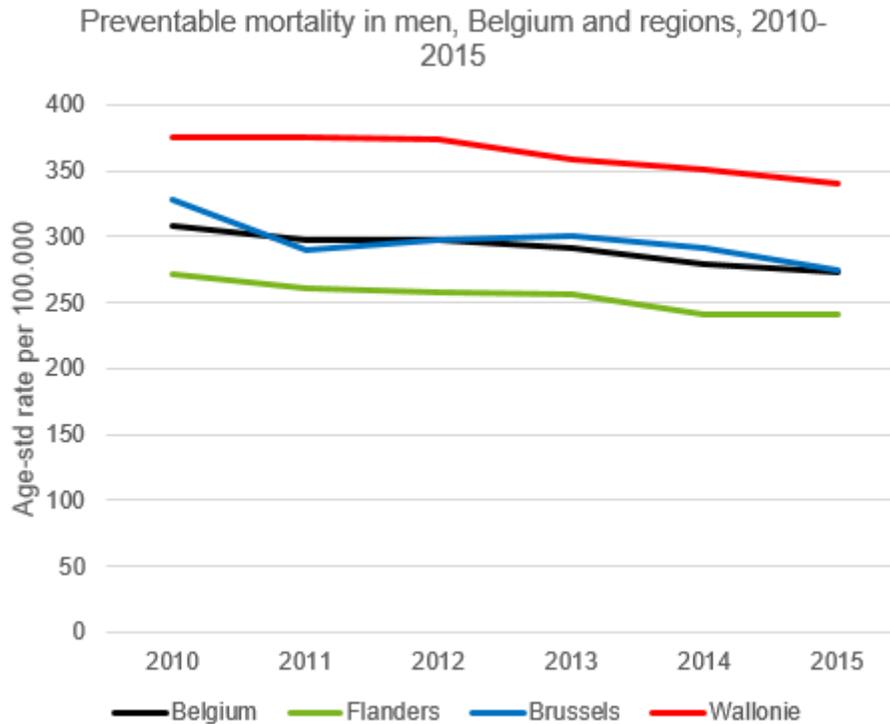


Source = author's calculation from Statbel causes of deaths database



3. Evolution by sex and region over time

The preventable mortality (below 75) decreases slowly in men, but remains almost stable in women (slight decrease in Flanders and increase in Wallonia). This is mainly due to the progression of lung cancer mortality in women.

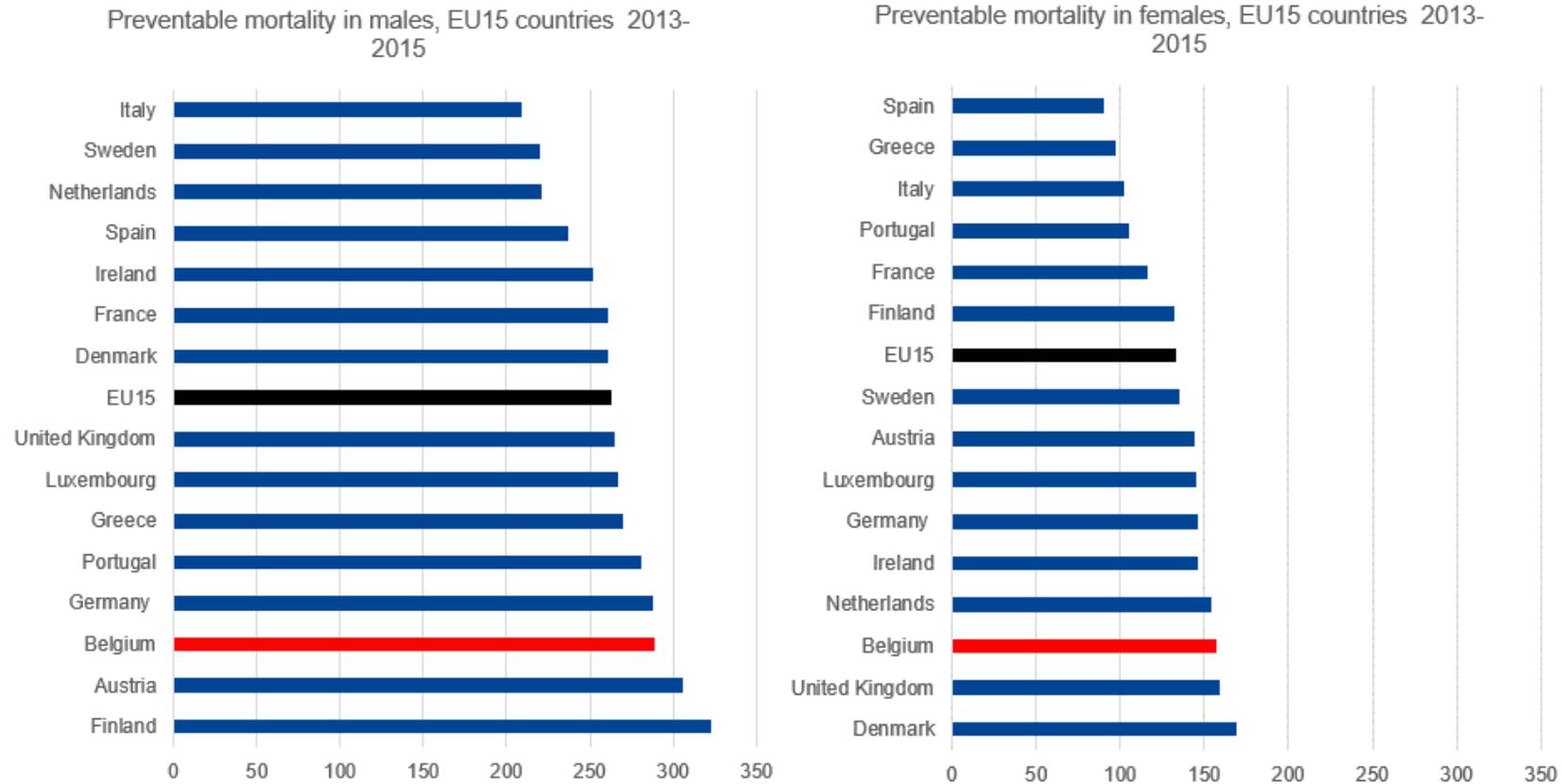


Source = author's calculation from Statbel causes of deaths database



4. European comparison, preventable mortality in EU 15 countries, 2013-2015

Belgium ranks poor for preventable mortality for both sexes.



Source: Eurostat

**Key messages :**

Mortality regarded as potentially amenable through the health care system ranks rather good among men (as compared to EU15), in contrast women have rates similar to the EU average.

Like all types of mortality, it is higher in men than in women (sex ratio : 1.37), and higher in Wallonia and Brussels compared to Flanders.

It decreases slowly but steadily over time.

Mortality regarded as potentially preventable through health policies ranks very poor (13/15) among the EU15 countries, and this in both genders.

It is much higher in men than in women (sex ratio : 1.8)

It is 40% higher in Wallonia and 20% higher in Brussels than in Flanders in both genders.

It decreases slightly over time in men, whereas for women there are different trends across the 3 regions (decrease in Flanders and increase in Wallonia).

References

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5. Nolte E, Mckee M. Population health in Europe: how much is attributable to health care? World Hosp Health Serv 2004;40(3):12-4, 40, 42.