Mapping Socio-economic Inequalities in Cancer Mortality across European Countries*

Led by the International Agency for Research on Cancer in collaboration with Erasmus MC, The Netherlands

Highlights:

◉ Extensive socio-economic inequalities in cancer mortality exist between countries.

◉ Everywhere, individuals with lower socio-economic positions experience higher mortality rates for most cancer types compared to those with higher socio-economic status.

◉ The Baltic and Eastern European regions show the highest socio-economic inequalities in cancer mortality for both men and women.

◉ Among women, high socio-economic inequalities in cancer mortality are observed also in the Nordic countries.

◉ Socio-economic inequalities in cancer mortality are highest for preventable cancers, such as lung cancer and cervical cancer.

◉ Urgent action is needed to reduce the burden of cancer across all segments of the population, particularly the most disadvantaged groups.

Challenges:

The burden of cancer

Cancer is the leading cause of premature death for people under the age of 70 in EU27, Norway and Iceland. In 2022, there were over 3.4 million estimated new cancer cases diagnosed (Figure 1) and 1.6 million deaths from cancer in the EU (Figure 2).

These numbers are projected to rise by 2040.

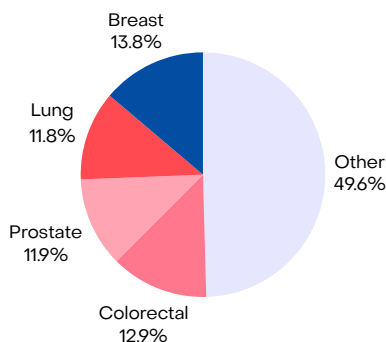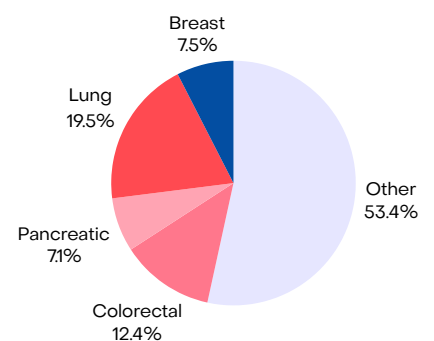**Figure 2.** Cancer mortality in the EU for both sexes in 2022[1]

Breast 7.5%
Lung 19.5%
Pancreatic 7.1%
Colorectal 12.4%
Other 53.4%

Figure 1. Cancer incidence in the EU for both sexes in 2022[1]

Breast 13.8%
Lung 11.8%
Prostate 11.9%
Colorectal 12.9%
Other 49.6%

Why socio-economic inequalities in cancer matter?

Across the European region, individuals with lower socio-economic status face higher mortality rates for various cancers, including lung, colorectal, stomach, cervical, prostate, and breast cancers.[2] Therefore, addressing socio-economic inequalities in cancer is crucial for alleviating the overall burden of cancer.

* 15 European countries were included in this study: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Italy, Lithuania, Norway, Poland, Slovenia, Spain and Sweden.

Inequalities:

Education inequalities by country

The EU-CanIneq study[3] shows that considerable socio-economic inequalities in cancer mortality exist across the 15 European countries studied. There are large variations between regions, with the Baltic and Eastern countries showing the highest mortality rates as well as the highest inequalities in cancer mortality. Cancer death rates for individuals with higher education are lower and show less variability across countries. Conversely, death rates in low-educated individuals are higher and much more variable across countries, emphasizing the significant influence of the country's context on their probability of dying from cancer (Figure 3 and 4).

Education inequalities by sex

Moreover, regional differences are seen in the patterns of socio-economic inequality between men and women: among men, the Baltic and Eastern European region exhibit the highest socio-economic disparities between the high and low educated (figure 3). Among women, however, very large inequalities in cancer mortality between low and high education are observed also in the Nordic countries, particularly Norway and Denmark (figure 4). This is particularly concerning, as the Nordic countries are known for their robust welfare systems and egalitarian policies.
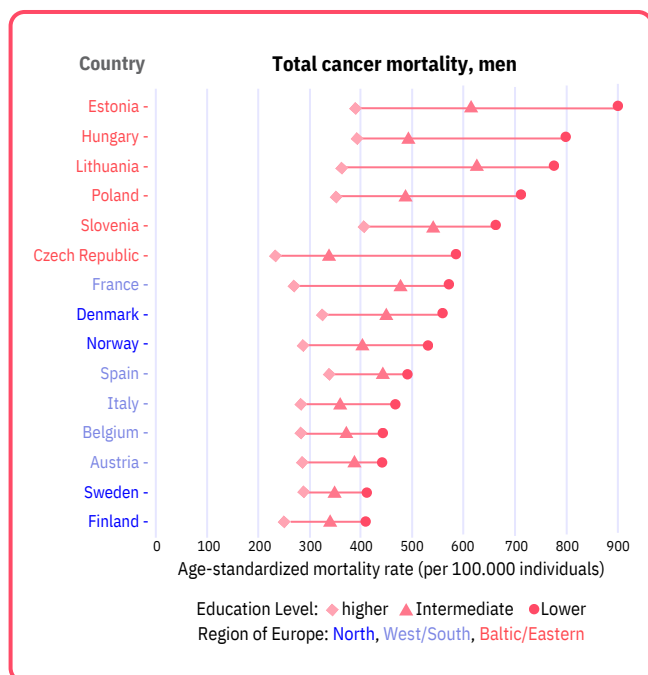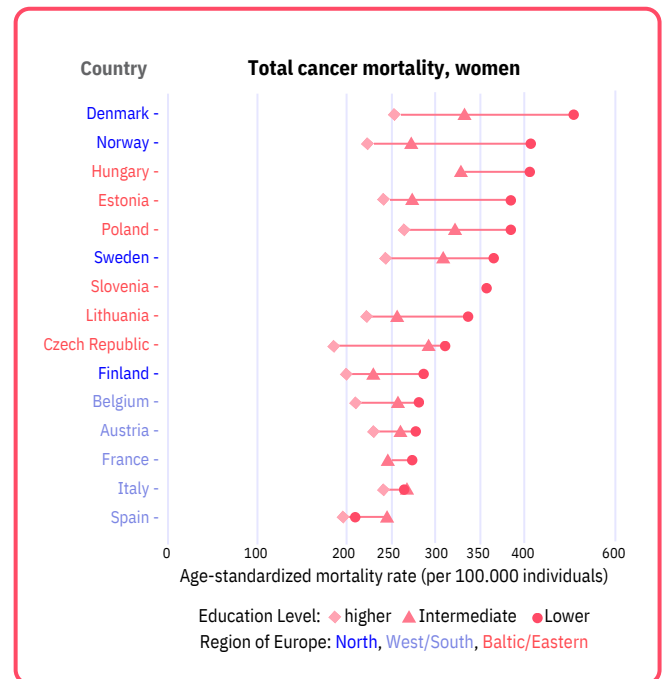

Figure 4. Educational inequalities in total cancer mortality, women

Education inequalities by cancer types

Socio-economic inequalities are observed across all cancer types, but it is important to highlight that largely preventable cancers, like lung and cervical cancer, show the most pronounced socio-economic inequalities in cancer mortality.

What are the reasons behind such inequalities?

The observed socio-economic inequalities in cancer mortality may stem from the accumulation of inequalities at all stages of the cancer continuum, with varying contributions at each step, potentially differing across various cancer sites.

For cancers with a relatively poor prognosis and for which a main risk factor has been identified, such as lung cancer, socio-economic inequalities in cancer mortality are predominantly deriving from exposure to the risk factor, compared to disparities in diagnosis and treatment.

a. Example: Lung cancer

Despite efforts in tobacco control, smoking, the primary risk factor for lung cancer, shows strong ties to socio-economic status, with higher prevalence in lower socio-economic groups. Educational differences in lung cancer mortality mirror variations in past tobacco consumption.

Figure 3. Educational inequalities in total cancer mortality, men

b. Example: Cervical cancer

Cervical cancer is largely preventable through effective screening programs that identify and treat precancerous lesions. Inequalities in cervical cancer mortality predominantly stem from inequalities in the access to effective screening. Countries like Finland and Sweden, where well-organized screening programs are in place, show smaller inequalities in screening uptake and cervical cancer mortality. HPV vaccination is also very effective, and due to its recent implementation, its impact will be visible in the future. [4]
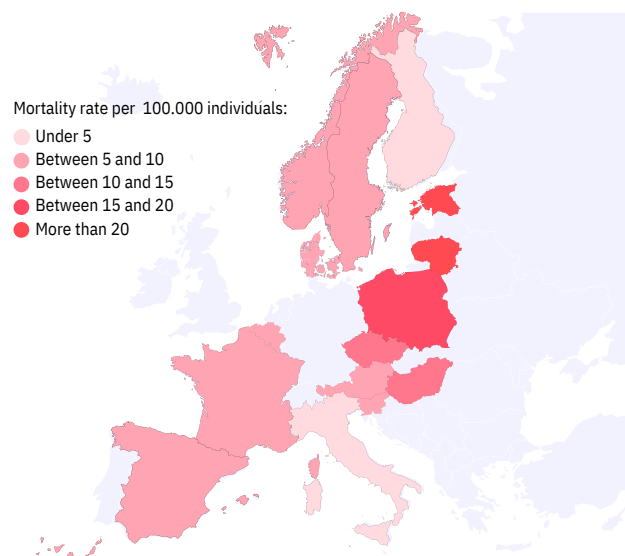

Mortality rate per 100.000 individuals:
- Under 5
- Between 5 and 10
- Between 10 and 15
- Between 15 and 20
- More than 20

Figure 5. Rate ratios in the age-standardised mortality rates between low- and high-educated individuals in 2015-2019 for cervical cancer

Closing the gap:

◉ This assessment holds key implications at individual, national, and European levels. Nationally, reducing socio-economic disparities is vital for lowering overall cancer mortality rates. At the European level, these findings underscore the importance of socio-economic factors in explaining differences in cancer burden across the continent for most cancer types.

◉ Despite the existence and availability of effective prevention measures, inequalities persist in the exposure to risk factors and access to healthcare and screening, highlighting the need for targeted interventions to improve access to prevention and equitable care for all, particularly the most disadvantaged groups.

◉ Awareness, monitoring and quantification of socio-economic inequalities in cancer mortality can guide policymakers in reducing the cancer burden.

◉ Continued efforts in collecting harmonized data on social inequalities and cancer mortality are vital. Reliable data is crucial for accurate projections and informed policy decisions. Future steps involve incorporating recent data for countries with real world data and extrapolating estimates to all other European region Member States.[5]

◉ At EU level the European Cancer Inequalities Registry helps to identify cancer disparities and trends across countries and regions, understand progress achieved over time at national levels and help guide investments. Europe's Beating Cancer Plan supports Member States in improving access to cancer treatment and screening to lower deaths and incidence; for example the 2022 Council.

For more information:

- The European Cancer Inequalities Registry is a flagship initiative of the Europe's Beating Cancer Plan.
- Further information on IARC's work on cancer inequalities can be found on cancer-inequalities.iarc.whoc.int.
- Further information on EU-CanIneq can be found on the European Comission's page.

References:

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