Effect of environmental factors on cancer in Europe
EUROPEAN CANCER INEQUALITIES REGISTRY
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HIGHLIGHTS

- Roughly, 10% of the cancer burden in Europe is attributable to environmental factors.
- Approximately 97% of the EU urban population live in areas that exceed the WHO recommended level for ambient air pollution exposure, increasing the risk of poor health, including lung cancer.
- Considerable differences between countries are observed in estimated lung cancer deaths attributable to ambient air pollution, residential radon, and second-hand smoke.
- On average, men are affected twice as much by the environmental pollutants as compared to women.
- The Zero Pollution Action Plan and the European Green Deal aim to reduce exposure to environmental pollutants and their detrimental effects on the health of European citizens.

CHALLENGES

Environmental cancer risks
Exposure to environmental carcinogens (air pollution, carcinogenic chemicals, residential radon, UV radiation and second-hand smoke) is estimated to be responsible for over 10% of new cancer cases and around 9% of overall cancer deaths in Europe. The cancer types linked to environmental carcinogens exposure include lung, skin, bladder and mesothelioma cancers, among others. Air pollution, residential radon and second-hand smoke exposures are the leading causes of lung cancers after smoking.

Figure 1 – Contribution of exposure to selected environmental carcinogens to cancer deaths in 2019 in Europe. For comparison, smoking is estimated to contribute around 70% of lung cancer and 20% of all cancer deaths.

*In this factsheet Europe refers to EU27 + EFTA (excluding Liechtenstein). This factsheet does not include contribution of occupational risk factors. Ambient air pollution refers to ambient particulate matter (PM) pollution. Household air pollution refers to the use of solid fuels for cooking, including coal, charcoal, wood, agricultural residue, and animal dung. Radon is a gas that is drawn into homes from the ground.
Lung cancer deaths due to exposure to environmental carcinogens

Lung cancer is the most common cause of cancer deaths and the fourth most common cancer in both sexes in Europe. It is estimated that in 2020 in the EU27 countries, lung cancer contributed over 318 thousand new cancer cases and nearly 260 thousand cancer deaths.

Notably, 97% of the EU urban population is exposed to ambient air pollution that exceeds the WHO recommended level for exposure, so live in areas with increased risk of poor health, including lung cancer (Figure 4b).

In 2019 in Europe*, over 56 thousand lung cancer deaths were estimated to occur due to environmental exposures.

Given the high burden of lung cancer and its established association with environmental carcinogens, limiting exposure will contribute to a substantial reduction of the cancer burden in Europe. Understanding the inequalities in population exposure and the detrimental health effects of the environmental carcinogens will help countries provide tailored-made policies to mitigate this burden.

INEQUALITIES

Geographical inequalities

EXPOSURE TO AIR POLLUTION, RESIDENTIAL RADON AND SECOND-HAND SMOKE

The concentration of carcinogenic air pollutants and residential radon differs between countries, affecting an individual’s exposure and consequently the risk of lung cancer, among other cancers (Figure 4-6).

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EU countries are also not uniformly affected by exposure to indoor radon (Figure 5 a, b).

For most EU countries (most notably for Poland, Hungary and Bulgaria) the biggest single environmental risk factor contributing to lung cancer deaths is ambient air pollution; however in Estonia, Sweden, Finland and Norway, air pollution had less impact on lung cancer deaths than the other types of exposure considered in this factsheet. Cancer deaths from household air pollution are of less prominence.

Inequalities by sex

Men in Europe die of lung cancer due to exposure to environmental carcinogens twice as much as women (Figure 8).

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Inequalities by income

There are also inequalities by the Gross Domestic Product (GDP) per capita in Europe. The map (reproduced from the European environment and health atlas 7) shows that the 20% most polluted areas (with highest average PM2.5 levels) often overlap with those regions with lower GDP per capita.

Figure 9 – The income levels (in terms of GDP per capita), on which the 20% most polluted (from particles in air) regions is overlaid 7.

CLOSING THE GAP

The inequalities highlighted here, between EU countries and socioeconomic groups, show the need for action – from governments and public health authorities - to mitigate the detrimental impact of environmental carcinogens on health.

Commission initiatives, such as Zero Pollution Action Plan and the European Green Deal strive to support this action.

The revision of the Ambient Air Quality Directives aims to achieve a 60% reduction in air pollution by 2030 and will align the current air quality standards with the 2021 recommendations of the World Health Organization (WHO Air Quality Guidelines).

The Zero Pollution Action Plan aims to reduce by 2030 the number of premature deaths caused by air pollution by at least 55% compared with 2005 levels.

Zero Pollution Action Plan Flagships:
Reducing health inequalities through zero pollution
Supporting urban zero pollution action

Local and National authorities can be supported 10 in their implementation of interventions in the areas of mobility and clean public transport, walking and biking as well as management of traffic and parking spaces, speed limits and low-emission zones for example. As well, interventions at industrial and agriculture level can have great impact in reduction of PM levels 11.

The Europe’s Beating Cancer Plan aims to help create a ‘Tobacco-Free Generation’ where less than 5% of the population uses tobacco by 2040, compared to around 25% today.

The revision of the Council recommendation on smoke-free environments (2009) and the further implementation of the WHO Framework Convention on Tobacco Control and the guidelines, policies and recommendations will contribute towards this goal.

The Plan also supports Member States in implementing the requirements on protection from ionising radiation, particularly radon.

The European Code against Cancer (ECAC) informs individuals on how to reduce their risk of cancer, including how to reduce exposure to environmental carcinogens at home or in the workplace.

ECAC recommendations:
Make your home smoke free. Support smoke-free policies in your workplace.
Find out if you are exposed to radiation from naturally high radon levels in your home. Take action to reduce high radon levels

FOR MORE INFORMATION

- The European Cancer Inequalities Registry is a flagship initiative of the Europe’s Beating Cancer Plan.
- More information about Tobacco and Smoking effects on health and examples of policy recommendations and implemented policies aiming to decrease tobacco use or exposure to tobacco smoke can be found in the Health Promotion and Disease Prevention Knowledge Gateway.
- Other relevant EU resources: Horizon Europe Mission for Climate Neutral and Smart Cities, New European Bauhaus initiative, Covenant of Mayors, Europe’s air quality status 2023.

REFERENCES

[7] European environment and health atlas
[8] European Cancer Inequalities Registry
[9] Indoor radon concentration - Digital Atlas

CONTACT INFORMATION

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#EU Cancer Plan #EU_ScienceHub

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