

Pesticides and Human Health

Our nation needs a steady supply of food to live, however there may be a considerable downside to our increasing use of chemical pesticides to maintain the current and future levels of production. Although pesticides are developed to prevent, remove, or control harmful pests, concerns about the hazards of pesticides towards the environment and human health have been raised by many studies.

Food production systems in Europe rely on chemical pesticides to maintain crop yields. However, widespread pesticide use is a major source of pollution — contaminating water, soil and air, driving biodiversity loss, and leading to pest resistance. Human exposure to chemical pesticides is linked to chronic illnesses such as cancer, and heart, respiratory and neurological diseases.



Across the world, researchers in many nations are beginning to question the safety of long-term exposure to combinations of chemicals residues that are found on and within the various foods that we import and eat.

Studies suggest that pesticides may be related to various diseases including cancers, leukaemia, and asthma. The risk of health hazards due to pesticide exposure depends not only on how toxic the ingredients are but also on the level of exposure. In addition, certain people such as children, pregnant women, or aging populations may be more sensitive to the effects of pesticides than others.

Diet is the main source of exposure to pesticides in the general population due to pesticide residues on food, in particular fruits and vegetables but also food products of animal origin. Occupational exposure may occur when workers in farms, forests or urban areas apply pesticides, as well as while maintaining spraying machinery or using materials treated with pesticides. Agricultural workers have been found to carry pesticides home on their clothing, exposing their families, while people living near fields where pesticides are applied can be exposed through pesticide drift and volatilisation.

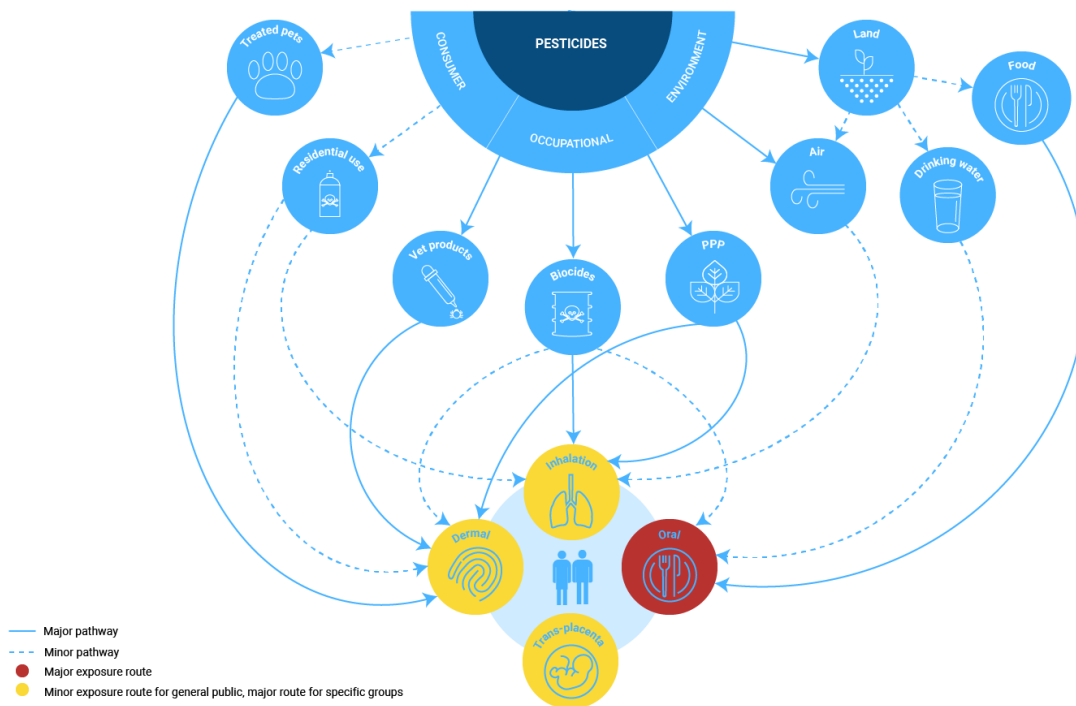
It is important that these reports are not viewed as being alarmist. Indeed, recent monitoring data on pesticides in food, held by the European Food Safety Authority (EFSA), suggest that dietary exposure to individual pesticides is unlikely to pose a risk to consumer health. In 2020, maximum residue levels were exceeded in only 1.7% of samples from the most consumed food commodities in Europe. Whilst this may be reassuring, there are legitimate concerns that the methodology did not account for possible mixture effects.

To better understand human exposure to pesticides in Europe, the European Human Biomonitoring Initiative (HBM4EU) conducted a large-scale human biomonitoring survey in adults and children across five European countries between 2014 and 2021. Rather worryingly, all of the pesticides monitored under HBM4EU were detected in higher concentrations in children than in adults.

Compared to their body weight, children tend to consume more food than adults. High fruit and vegetable consumption in particular, tends to be associated with higher socio-economic status, has been linked to higher exposure to organophosphate pesticides in both pregnant women and children.

Interestingly, “organically grown” fruit and vegetable consumption has been linked to lower pesticide levels in the human body, both in children and adults.

Consumption of foods produced in agriculture are not the only route by which humans are potentially exposed to harmful substances. The chart below illustrates some of the other means of exposure.



Veterinary medications are necessary for both contemporary animal husbandry and food production, but their residues can linger in foods obtained from animals.

It is not yet possible to derive estimates of the burden of disease from pesticides in Europe, either for the general population or for specific groups. However, strong or suspected links have been established between exposure to pesticides and increased risk of several chronic diseases, including:

- various types of cancers (e.g. Non-Hodgkin lymphoma, multiple myeloma, ovarian, breast, brain and prostate cancers);
- neurological disorders such as Parkinson’s and Alzheimer’s diseases;
- cardiovascular diseases;
- developmental delays in children;
- effects on reproductive capacity and male and female infertility;
- cognitive impairments;
- impaired respiratory health.

While it is not always possible to identify the active substances involved, certain groups of pesticides have sometimes been associated with increased risk of certain types of health effects.

Pressure groups like the Pesticide Action Network *UK* have a more radical agenda and wish to change UK government policies on deciding how pesticides are regulated, particularly since our departure from the EU. Before EU exit, the responsibility for regulating pesticides largely sat in Brussels. So far, the UK has largely maintained the European approach to pesticide regulation that it helped to create as an EU Member State. Currently the EU is now pushing forward a range of progressive new initiatives designed to increase protections for human health and the environment, from which the UK will no longer benefit.



Castigating our hard-pressed farming industry that has merely been trying to produce food that is affordable is not the answer to this complex problem. To mitigate impacts on human health and ecosystems, it is important to restrict or ban pesticide use in public spaces, areas used for drinking water abstraction, and, where possible, ecologically sensitive areas.

As consumers we should be aware of the types of foods that may carry a higher risk of being contaminated. A list of more concerning foods is published by the PAN. If you wish to view it, follow this link: [Dirty-Dozen-2024.pdf](#)

Improving EU-level information on pesticide use is also essential to understanding and managing risks. This can include requiring more systematic post-marketing surveillance, strengthening farm-level data collection on pesticide use (as suggested under the proposed regulation on sustainable use), and expanding human biomonitoring and environmental monitoring.

Supporting new farming initiatives that grow food in a manner that can reduce our dependence on chemical pesticides will ultimately be more helpful but it will require investment in newer biocides and even genetically modified foodstuffs that will raise all sorts of other ethical and environmental concerns.

Sources

[How pesticides impact human health and ecosystems in Europe — European Environment Agency](#)

[Exposure to pesticides and the associated human health effects - ScienceDirect](#)

[Veterinary Drug Residues in the Food Chain as an Emerging Public Health Threat: Sources, Analytical Methods, Health Impacts, and Preventive Measures - PMC](#)

[Human Relationships with Domestic and Other Animals: One Health, One Welfare, One Biology - PMC](#)

[UK Policy - Pesticide Action Network UK](#)

[Assessment of human dietary exposure to residues of veterinary medicines in the EU | European Medicines Agency \(EMA\)](#)