

## THE VULNERABILITY OF THE HUMAN BODY TO CHEMICALS

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**Introduction.** The human body is exposed daily to a wide range of chemicals from the environment or occupational environment. Tissues and cells are the first biological levels that come into contact with chemical agents, and their vulnerability largely determines the systemic toxic effects. Chemicals can induce: oxidative damage, mitochondrial dysfunction, changes in cell membranes and can affect intra- and extra-cellular signaling processes. Rapidly proliferating tissues, such as liver, dermal or lung, show increased vulnerability to chemicals. Children, the elderly and those with chronic diseases are more susceptible to the harmful effects of chemical exposures.

**Material and methods.** Review of national and international scientific literature on the management and exposures to chemicals, toxicology and public health. PubMed articles were analyzed that reflected the mechanisms of chemical toxicity at the cellular and tissue level, oxidative effects, biological, epidemiological and regulatory aspects related to the vulnerability of the human body to chemicals.

**Results.** Exposure to chemicals can cause various health problems, from minor irritations to serious conditions, affecting the immune system and increasing susceptibility to infections depending on individual vulnerability. The issues related to the safe use of chemicals and reducing potential side effects on health, concern specialists around the world. The results of some studies note that cumulative exposure to various chemicals can worsen liver functions. According to some EU guidelines, around 144,000 synthetic chemicals are registered. Some chemicals can lead to lipid oxidation and oxidative stress, the latter considered to be a central mechanism in cellular toxicity. Analysis of statistical data on the general morbidity of the population of the Republic of Moldova over a period of 10 years (2014-2023) indicates an average annual increase in the number of cases per 100 thousand populations. In particular, the overall prevalence has increased: from 9607,7 ‰ in 2014 to 11904,6 ‰ in 2023.

**Conclusions.** The vulnerability of the human body to chemicals is a complex phenomenon. In order to protect the health of the population, it is important to be aware of the potential dangers of chemicals, take appropriate measures, and manage and handle chemicals responsibly.

**Keywords:** chemicals, risk, toxicology, human body, cells, vulnerability