

### ON THE ISSUES OF DEFINING ENVIRONMENTAL DISEASES

*Abstract.* The typology of environmental diseases is considered with the focus on their origin. The lack of consistent classification hinders efficient analysis and assessment of the environmental impacts of the man-made activity.

*Key words:* environmental pollution, health hazard, morbidity.

The environmental problems of modern society are directly and indirectly related to the disease burden at global level, growing with stable pace, as it was shown in multiple report by national and world health care agencies, published at the edge XXI century and revised on a regular basis [2]. The most of concerns was primarily related to the air pollution, as the connections were clearly formulated in the corresponding report by the WHO [7]. This was recognized by most governments and efforts were invested in phasing out those environment pollutants for which human health effects were proved to be the most detrimental. These trends have reached Chinese research community, actively discussing health issues raised by poor control over the industrial pollution of the outdoor air [6].

Nevertheless, environmental problems encompass such a broad field of issues that the concept of environmental diseases is not well established and is very flexible in application.

The analysis of the research papers from the Google Scholar platform (total of 56 papers) mentioning environmental diseases as the focus of research are mostly about differentiation of environmental and other causes of diseases. Those papers, giving the definition of an environmental disease are mostly concerned with pollution-related conditions, including both chemical and physical types of pressures. However, a more broad definition is also accepted, stating that an environmental disease refers to any pathologic process, caused by the effect of physical or chemical agents, as well as poor nutrition, and behaviors [4].

Thus, there is a need for delineation between environmental diseases and related conditions, in particular:

- Environmental Diseases vs. Pollution-Related Diseases – where Pollution-Related Diseases represent a subset of Environmental;
- Environmental Diseases vs. True Genetic Disorders – since the latter ones are inherited disorders, having long history through generations, not proved to be affected by man-made transformations of the environment; however, the carcinogens and mutagens are known to be produced by humans and be responsible for increasing rates of corresponding diseases in modern times;
- Environmental Diseases vs. Occupational Diseases – in this case the boundary is set by the fact of voluntary exposure to the pollution of any kind, due to professional choices, as well as limited propagation outside the industrial facilities.

With this updating, it is possible to elaborate the following structure of environmental diseases:

1. Lifestyle diseases, caused by behavioral choices, preconditioned by multiple reasons ranging from economic to religious, include a variety of conditions optionally termed as diseases of longevity, diseases of civilization, diseases of affluence or diseases of poverty. This group would allocate major subtypes of diseases related to one of the following reasons: substance abuse, lack of physical activity, unhealthy eating and risky activities.

2. Diseases caused by physical factors, which originate from human induced natural or created physical hazards, e.g. ionizing radiation at mining facilities and fallout communities correspondingly.

3. Pollution related diseases represent a well-defined group of disorders, caused by chemical contamination of the environment, e.g. Minamata disease or manganism.

An important issue of the second and third categories is that the origin of pollution should be accounted: the geochemical and geophysical, as well as biological endemics are of great importance in the formation of morbidity at certain areas, but pollution implies dispersion haloes, produced by human activity of any kind. Nevertheless, the endemics are also environmental diseases in their pure sense and could be attributed to these or separate category.

At the same time we face the problems in defining the exact causes of many diseases and environmental and status of the environment is often only a component of the mix, as it is established for cardiovascular diseases [3] and cancer [1]. For example, a massive research in selected European countries (Belgium, Finland, France, Germany, Italy, and the Netherlands) demonstrated that 3–7% of the annual burden of disease in the participating countries is associated with the environmental pollution, primarily PM<sub>2.5</sub>, secondhand smoke, traffic noise and radon [5]. This brings us to the fact that certain diseases might be attributed to few categories of environmental diseases simultaneously. However, this shouldn't be considered as an major obstacle for the classification, it is rather an issue of interpretation, which should be solved depending on the purpose of research where the most important fact is partially environmental nature of the disease

What is more important and is out of the given research scope, whether there is a possibility to manage the level of diseases propagation by environment quality enhancement [8].

The final classification is yet to be established since we are constantly revising our understanding of the environment role in the health formation.

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UDC 579.2

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### ABOVE AND BELOW: INVESTIGATING THE SEA SURFACE MICROLAYER AND ITS ECOLOGICAL IMPORTANCE FOR CLIMATE CHANGE MONITORING

*Annotation.* The sea surface microlayer (SML), a thin boundary between the ocean and atmosphere, harbors a rich and diverse bacterial community. This unique environment, distinct from the underlying water, exhibits remarkable adaptations to survive harsh conditions and constant UV radiation.