THE PUBLISHING HOUSE
OF THE ROMANIAN ACADEMY

CLIMATE CHANGE, ONE HEALTH AND PUBLIC HEALTH: A REQUIRED CHANGE FOR BETTER POPULATION HEALTH

Andreea STERIU [1*], Dana Galieta MINCĂ [2]

[1]Lecturer, Discipline of Public Health and Management, Department of Pre-Clinical Sciences III, Faculty of Medicine, University of Medicine and Pharmacy "Carol Davila", Bucharest
[2]Habilitated Professor, Discipline of Public Health and Management, Department of Pre-Clinical Sciences III, Faculty of Medicine, University of Medicine and Pharmacy "Carol Davila", Bucharest

**Corresponding author*: Andreea STERIU - andreea.steriu@umfcd.ro

Received March 17, 2025

Earth's climate has known changes in time. The anthropocene makes no exception. Its ecosystems need changes, too. The aim: to highlight the challenges which climate change pose to human health in the wider Romanian health system context. Demographic and epidemiological transition are explored. Opportunities for good public health stewardship and practice are raised through monitoring tools such as the United Nations' Sustainable Develoment Goals (SDGs). SDG 3 has been monitoring the global burden of disease and records results in trend for its indicators. Improvement in results of these indicators can be registered only by acting through other SDGs, such as SDG 15. Given the complexity of the demographic and epidemiological transitions which Romania crosses, 2025 marks a new start in joining up these two Strategic Goals. Public Health already assists with the monitoring and the evaluation of the population health status with demographic and health indicators. Public health provides the right ground and capabilities in further assisting the OneHealth initiative in Romania. Cross-sectoral health risks mitigating policies must defend and improve the public's health. The wider societal engagement and active community invlovement remain pivotal in reversing the demographic trend and in improving the health status of the Romanian population.

Keywords: Climate Change, OneHealth, Public Health

To ensure that health and wellbeing are protected in the climate change response, public health addresses audiences with the following aim: to build the capacity to understand, monitor, and quantify health impacts of climate change and most importantly the health co-benefits of accelerated action, to deliver cross-cutting themes across public health domains; to address inequalities and ultimately empower communities to lead better lives.

Climate change is already affecting the health of European populations. Most systematic reviews suggest that climate change is associated with worse human health. Estimates suggest that heat-related mortality had increased by 33% in the WHO European Region in 2018 compared with 2000. The burden of the multiple health risks that climate change poses on health systems is also expected to increase. The COVID-19 pandemic provided a glimpse of the fragility of Europe's health systems when faced with unexpected demands. While we're on complex respiratory conditions and given that this latest zoonosis, COVID-19, appears to have stemmed out from the wild it is worth mentioning the central place of Romania's forests in our lives.

Recently published directions from the UN and WHO in a Viewpoint paper in the Lancet by Marina Romanello and collaborators, namely tracking progress on health and climate change in Europe via unanimously agreed frameworks has given much food for thought to the relation of climate change and health.

According to Romanello et al, in Europe, The Lancet Countdown has developed indicators of mitigation and health co-benefits along three tiers. The first is to capture the health gains of Europe's low-carbon transition. It was then when the Lancet Countdown adopted the tiers proposed with the Hess framework. The first tier will track progress along each mitigation sector for which health-relevant policies can be developed, namely: energy,

transportation, buildings, food systems, land use and land cover, all based on their health co-benefits potential. The second tier will track exposures relevant to, and linked to, those mitigation pathways – including: air pollution, red meat consumption, and urban noise levels. The third tier, leveraging on available European epidemiological data, will monitor the attributable health outcomes of the exposure pathways. Accordingly, the conceptual model, shown by Romanello et al, links mitigation actions relate to relevant exposure pathways and associated groups of health outcomes. This holistic approach allows identification of European sectors to allow for ultimately delivering the biggest health co-benefits from mitigation policies of related sectors: energy, transportation, food systems and land use change and forestry. The four big health co-benefits will be encapsulated around non-communicable diseases, mental health, infectious diseases and unintentional injury.

Along with the tiers, climate change in Europe aims to monitor health dimensions across five of its defined key domains: (1) climate change impacts, exposures, and vulnerabilities; (2) adaptation, planning, and resilience for health; (3) mitigation actions and health co-benefits; (4) economics and finance; and (5) politics and governance. Indicators will be refined on an annual basis as new data and better methods become available. Indicators for the Lancet Countdown in Europe will be developed following the same criteria as the global Lancet Countdown, albeit with geographical resolution requirements adjusted to the scope of this project. In its initial stages, the work will focus on the 38 European Environment Agency (EEA) member states and cooperating countries, with a view to expanding coverage to the whole WHO European Region (53 Memember States).

Key domain (1): climate change impacts, exposures, and vulnerabilities

It is worth highlighting the importance of this domain because the health of the population drives through dempography. For example, Romania's resident population has numerically declined from around 23 million to around 19million, an 18% decrease in 35 years. This was already mentioned in 2014. In fact the Romanian population decline is not an exception among the EU27 Member States, but it may be look like the most dramatic among them. Factors and determinants are complex, not for debate here, yet the last 35 year decrease cannot be easily overlooked. Although the active age-group of 15–64 has remained a constant proportion of 65–66%, the ageing-structure of Romania’s population is evident, given by the increase in the 65+ age-group from 9% to 19% and a decrease of the under-14 yr age-group from 26% to 16%. This happens now, more or less accelerated, throughout all European countries, but for Romania this undoubted fact provides the first combination of multiple factors related to climate change such as heat-waves. These are contributing to deterioration of health in the most vulnerable groups: children and the elderly. The demographic transition is in a phase were the declining natality has plateaud around 10 live-births per 1000 population, however, coupled with a higher mortality due to ageing, Romania's natural growth will only continue to remain low negative or may level in the next 20 years, at best; however, the total fertility ratio (TFR), the crude and net reproduction indeces underline the need of new mitigation plans for demographic policies. Moreover, the urban/rural ratio has drifted, as expected, towards urbanisation. The current demographic situation deals with consequences of stages 3–4 of the demographic transition. Two Romanian population pyramids of 2014 and 2050 show the natural changes in population age structures (Gheț̆au, 2014).

Key domain (2): adaptation, planning, and resilience for health

Adaptation includes three headings: 1) the biogeophysical characteristics, 2) the demographical situation and 3) the economic and infrastructural domains. Public health connects primarily with the basics of the demographic situation. Rudolf Virchow, the renowned german pathologist and the forefather of social medicine, enlightened us since the XIXth century with the fact that social medicine is a social science; and medicine is politics on a grand scale. This remark pre-empted the link between medicine and public health soon after John Snow, a physician, removed a pump handle in a London neighbourhood; an action which led to, or coincided with the end of a highly fatal cholera epidemic. It took approximately two centuries to reach today's anthropocene, where civilizations now clash with their own living imprint and adaptation into a highly urbanised environment. For the first time in this long period demographic and epidemiological transitions pose ”existential”

questions: what can societies do to improve the quality of life of their citizens given: scarce resources, climate change and ever-evolving technological changes underpinned by artificial intelligence (AI) development? Considering planning: the UN has defined the SDGs – Sustainable Development Goals - in the early 1990s. SDG 3 keeps reminding us that we are well behind on many of its targets. Last century, at first, for a substantial period of time, antibiotics started to save lives, thus improving life expectancy across populations. Maternal mortality was also higher then in some countries, with a clear Eastern and Western divide. Among Eastern countries Romania's rate was among the highest towards the end of the 1980s. Maternal mortality is one of the 13 indicators of the SDG 3 goal; there are more indicators: preventable infant deaths, whether neo-natal or post-neonatal, deaths in under-5 years, morbidity and mortality indicators for diseases such as HIV/AIDS, TB and malaria are also included; as well as, promoting good mental health and general well-being. The Goal goes on to mention the strengthening of prevention and includes third level prevention, such as treatment services for substance abuse, in other words addressing addiction, a well described social determinant of health which has been dominating mental health issues, including dual diagnoses. Injuries from road and traffic accidents, appropriate access to sexual and reproductive services, family planning are completing the indicators' list. A further key objective of WHO is to achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines. But these could not be planned, implemented and achieved without a point made on a ‘substantial’ reduction in the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination. SDG 3 gives plenty of room to any country to plan accordingly, Romania included.

Another sustainable development goal is SDG 15 and this engages with 'Life on Land': forests, desertification and biodiversity. This Objective must assist the above named domains along with SDG 3 and its health indicators. At times of climatic changes, highlighted through SDG 15, building resilience, to be reflected by SDHG 15 on SDG 3 indicators, is much needed. What makes SDG 15 worthy of consideration for resilience building has a twofold reasoning: Romania is not a land locked country, thus geographic diversity is important; secondly the OneHealth approach can lay prerequisites of the link to be made between SDG 15 and SDG 3 to allow for demographic resilience to be addressed, built and sustained. As sub-headings, SDG 15A and 15B policies can become key for Romania's OneHealth inbuilt ecosystems. Those engaged with working directly in conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands play a key role in achieving sustainable good health with an aim of ultimately achieving sustainable OneHealth and from the human health component point of view, demographic resilience.

Key domain (3): mitigation actions and health co-benefits

Given the multifactorial effects of climate change on human health, the understanding, identifying and monitoring of risks are essential pillars for delivering interventions aimed at protecting human health and its related extended ecosystems as defined by OneHealth.

To simplify on proof of positive impact actions, all proposed monitoring indicators are related to key epidemiological concepts: hazards, exposure, health impacts, as well as attributable impact to climate change. It is worth highlighting that Romanello et al say, including in all Annual Reports, that the implementation of adaptation measures will be monitored in the context of existing inequalities and this, in order to assess how variation in coverage might impact vulnerable populations, for example children and the elderly. This is particularly important for Romania. Health determinants have been defined over five decades ago and social determinants, part of environmental determinants, play an important role, including when considering the 54%/46% urban/rural split, as well as indicators which measure inequalities, such as the dependency ratio. One of the specific indicators is the acceptable rate of poverty (AROP) index and Romania has a substantial group in relative poverty with its vulnerabilities substantially linked to inequalities in health. Key domains (4) and (5) are drivers and they will need to engage with their essential non-healthcare specific actions, in order for demographic and health indicators to improve. However, the work under such ambitious strategic goals, SDG 3 and SDG 15, must be underpinned by information.

In conclusion, the multidisciplinary nature of collaborative working in public health must hold stewardship in all key domains of action.

Adaptable planned policies can be fostered with comprehensive holistic actions to address health and climate change in Romania.

Responsibility and accountability, doubled by good governance and societal effort, are key in achieving healthier lives, economic prosperity and this is also inclusive of good access to and good quality of health and social care. Although most governments recognize climate change threats to health these days, concrete health or health-care systems objectives are often weak. Specific health adaptation plans are at best fractured and at worst absent. Locally, adaptation remains largely siloed in specific departments (energy, transport, agriculture, etc.), with little or no inclusion of public health authorities or consideration of potential co-benefits from such expertise which allows for monitoring of hazards, exposure and health outcomes; or, unintended harms to the public's health.

By equally considering infectious and non-communicable diseases, mental health and unintended injuries, priority setting plays an important role. Addressing co-benefits of adaptation and mitigation plans via cross-sectoral policies in order to address hazards and exposures and overseeing social, economic, and political drivers of climate change and health, can demonstrably produce sufficient epidemiological data to inform health policies, to ultimately empower people and society into re-building its demography and allow for healthy ageing. This is where healthy ageing with compressed morbidity can also tackle healthcare efficiencies. This would allow and enable the identification of emerging risks, health opportunities for climate policies and actions, doubled by monitoring of a transition towards a lower-carbonised, yet healthier and a more sustainable society.

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