



**POSITION PAPER**

**Circular health: A needed approach to promote health and prevent pandemics and other health hazards**

**Flavio Lirussi<sup>1</sup>, Erio Ziglio<sup>2</sup>**

<sup>1</sup> Padua University, Padua, Italy

<sup>2</sup> Health University of Applied Science, Austria

**Corresponding author:** Professor Flavio Lirussi;  
Address: Via dei Rogati 6, 35122 Padova, Italy;  
Email: [lirussif@gmail.com](mailto:lirussif@gmail.com)

### Abstract

SARS-CoV-2 is a perfect example of the intimate relationship between human, animal and environmental health. Circular health goes beyond the biomedical concept of health, operating on the interface between individuals, microorganisms and ecosystems. The World Health Organization endorses this concept and stresses the importance of protecting the environment and addressing and reversing the negative impact of climate change. The application of circular health to the governance for population health is based on protection of all forms of life, interdisciplinarity, involvement of all of society, big data, artificial intelligence, and correct scientific information. It also considers a combination of health, environmental, social and economic problems caused by the synergistic interaction between the acute diseases - in this case caused by SARS-CoV-2, and a number of non-transmittable chronic pathologies. Disinformation and misuse of social media could be more dangerous for the pandemic's development than the virus itself. The adoption of circular health is an urgent necessity in restructuring development policies and making them more effective and sustainable, and protecting and promoting individual and collective health. Within public health, circular health should urgently become the mainstream approach to prevent pandemics and other health hazards. Given the many social, economic, and cultural changes undergoing in the countries of the South Eastern European Network the conceptual and policy framework related to circular health could be of great value in further advancing progress in this part of Europe.

**Keywords:** Covid-19, One Health, pandemics, SARS-CoV-2, syndemic, World Health Organization

## Introduction

In May 2020, the Director-General of the World Health Organization (WHO) has declared: *“The pandemic is a reminder of the intimate and delicate relationship between people and planet. Any efforts to make our world safer are doomed to fail unless they address the critical interface between people and pathogens, and the existential threat of climate change that is making our earth less habitable”* (1). His strong warning has been, unfortunately, unheeded. One and a half years later, we are still mourning more than 5 million people worldwide. The SARS-CoV-2 pandemic is the greatest global shock the world has experienced in recent decades. In any part of the world, humanity was totally unprepared to tackle a tsunami-like this. Of the many reasons responsible for this unpreparedness, at least two have been overlooked by the stakeholders involved in the decision-making process: 1) SARS-CoV-2 pandemic is not just a pandemic, is more than that; and 2) lack of awareness that we are all components of a single ecosystem that determines health in all its components which include humans, animals, plants and the environment.

## The syndemic approach

In an editorial in the Lancet, Richard Horton used the term *“syndemic”* in preference to a current pandemic of Covid-19 (2). The term syndemic was first introduced by the physician and anthropologist Merrill Singer in the mid-1990s. He stated that *“syndemics are the concentration and deleterious interaction of two or more diseases or other health conditions in a population, especially because of social inequity and the unjust exercise of power”*(3). Thus, the concept of syndemic refers to a combination of health, environmental, social and economic problems caused by the synergistic interaction between two or more diseases. The example here is the interaction between

the acute respiratory infection caused by the SARS-CoV-2 virus and a series of non-transmittable chronic illnesses (obesity, hypertension, diabetes, cardiovascular disease, chronic respiratory illnesses, and cancer). Horton argues that the approach to managing the spread but especially the pathology of Covid-19 is incorrect, because the health crisis has been approached as though it were caused by the infectious illness alone, without considering socioeconomic inequalities of the most vulnerable sectors of society (older people, the low-paid, ethnic minorities). *“Unless governments devise policies and programmes to reverse profound disparities, our societies will never be truly COVID-19 secure”*. Horton concludes that what is needed is an integrated approach, indeed a synergistic vision that encompasses different determinants of health such as education, employment, housing, diet, and the environment.

Horton's editorial accords completely with the views and concerns of the WHO during the current pandemic. The WHO has shown that, as infections spread, the lack of universal healthcare coverage leaves billions of people without safe access to medical treatment, and how huge inequalities and socioeconomic status have a profound impact both on mortality and the loss of the means to survive. WHO also stresses the importance of protecting the environment and addressing and reversing the negative impact of climate change. To this end, it put forward a Manifesto for a *“green and healthy”* recovery from Covid-19 (4). It included six recommendations: (i) protect nature; (ii) guarantee access to clean water; (iii) ensure a quick healthy energy transition; (iv) promote healthy, sustainable food systems; (v) build healthy, livable cities; and (vi) stop giving incentives for fossil fuel use. The last recommendation is one of the commitments made by COP26 delegates from nearly 200 countries: *“... accelerating efforts towards the phase-*

down of inefficient fossil fuel subsidies” (5). In addition, the Manifesto’s “prescriptions” are in line with the sustainable development goals of Agenda 2030 (6).

### **The concept of circular health**

The second element that jeopardised, or made rather ineffective, the prevention of and the response to the SARS-CoV-2 pandemic is the non-recognition that health is ONE. It means that the factors determining the health of humans, animals and plants are strictly dependent on each other’s. Hence, the factors to reduce the risk of new pandemics are the same as those needed to protect biodiversity and safeguard the health of animals and improve the environment.

The virologist Ilaria Capua, Director of the One Health Center of Excellence at the University of Florida, explains that the only path we can follow to never experience these types of pandemics again is to understand that we live within a system in which all living things are immersed. So, there are not just individuals and communities. The human species is not the only one that needs to be protected and preserved. The health of the planet and all its inhabitants must have equal dignity if we want to create an ecosystem that is sustainable, resilient, healthy, and durable (7). Capua also specifies what the difference between One Health and circular health is. While One Health recognizes the interconnections and interdependencies of the health of humans, animals, plants, and the environment, circular health is a broader integrated approach to promoting the health of humans, animals, plants, and the environment together. This model requires an expanded multidisciplinary convergence of efforts encompassing economic and financial, technological, societal and cultural, and international policies around one goal: the co-advancement of the health

as a system in a circular manner, where no single part is dominant over the others (8).

The South Eastern Europe Health Network (SEEHN) recognizes the importance and the raising need in the SEE countries for better coordinated actions towards the One Health/circular health approach and has the One Health strategy on to the agenda through its Regional Health Development Centers on Communicable Diseases (SECID) hosted by Albania and the one on Antimicrobial Resistance hosted by Bulgaria [personal communication by Dr Mira Jovanovski Dasic, Head, SEEHN Secretariat]. As it was explained above, the holistic vision of circular health represents a model of health based on the integration of different disciplines. The starting point is biomedical interdisciplinarity: human health, animal health, environmental health. But it also includes psychology, economics, engineering, chemistry, political science and social science. The circular health model is perfectly aligned with the “*whole-of-society approach*” and the “*whole-of-government approach*” promoted by the WHO in several health strategy European documents (9,10).

Translating the concept of circular health into action and make change happen requires the involvement and commitment of different development sectors of society and the participation of civil society. It also requires a breaking down of the disciplinary barriers between the physical sciences and life sciences. Depending on the problem to be addressed, this means improving the coordination, cooperation and integration levels of the measures that need to be taken to promote development and protect and promote collective health. Thus, alongside the integration of different disciplines we need to invest – and add “more health”, in every social sphere: from farming to science, from education and training to politics, from information to the economy. There is also an urgent need for an open

access to information and knowledge and an innovative use and development of appropriate technologies. Open access implies the sharing and the convergence of all data from different disciplines, while technology can be exploited in all its forms: artificial intelligence, big data, cloud, internet of things, up to quantum computing. According to a recent review, artificial intelligence has so far been used in at least four areas of healthcare systems in the fight against Covid-19: diagnosis, treatment, clinical decision-making processes and public health. It could potentially be used in four more areas: surveillance, combination with big data, reorganisation of operations and medico-surgical services, and management of patients with Covid-19 (11). The study concludes that, faced with increasing pressure on limited healthcare resources, the use of artificial intelligence-guided techniques in the prevention, diagnosis, monitoring, research into treatments and vaccines, and decision-making processes of public health can help improve the efficiency and efficacy of efforts to combat this (and future) pandemics. The core principle here is to benefit citizens and the survival of life on the planet. It should not be underestimated, for example that thanks to the new technologies pharmaceutical companies were able to produce anti Covid-19 vaccines in less than a year. Other very promising examples come from the ethical and innovative use of big data and artificial intelligence the authors have described in other articles (12,13). Whether AI can advance the interests of patients and communities depends on a collective effort to develop and implement ethically laws, policies and ethically designed AI technologies (14). To this end, WHO has recently published a guidance document entitled “Ethics and governance of artificial intelligence for health” addressed especially to three sets of stakeholders: AI technology developers, ministries of health

and health-care providers. Needless to say, the implementation of the guidance will require collective action. In other words, ethical considerations and human rights must be placed at the centre of the design, development, and application of AI technologies for health (15). Interestingly, a national survey of the Italian Young Medical Doctors Association including 382 participants, showed that only 13% had experience in big data during clinical or research activities, 13% in -omics technology and predictive models, 13% in Artificial Intelligence, 6% had experience in internet of things, 22% experienced at least one telemedicine tool and 23% of the participants declared that during their clinical activities data collection was paper-driven. Thus, there is an urgent need for integration of pre- and post-graduation training in digital health to provide adequate medical education (16).

### **The issue of governance for health**

All these potentially positive development needs to be facilitated and overseen by a much stronger governance that we have today (17). Principles sustaining the new governance for health should be open, sustainable, collaborative, and ethical. Two basic elements are also needed to strengthen governance and practice for health, development, and inequality reduction. The first relates to a vision of the future that can influence decision making in all areas of policy, not just healthcare. Here the circular health perspective is both scientifically and strategically fundamental. The second element obviously involves political will and the active participation of civil society to transform that vision into daily practice. Indeed, this is the real challenge in the years to come: understanding how to realize in practical terms this new approach to health, so that it is reflected on a new governance for health, inclusive and circular. Luckily, there are positive signs in this direction: the recent report of the WHO Pan-European

Commission on Health and Sustainable Development entitled “*Drawing light from the pandemic. A new strategy for health and sustainable development*” calls for the full implementation of the concept of One Health in all settings where health policies are developed and urges to operationalise One Health at all levels (18).

### **Circular health and information**

Health education, training and governance cannot take place without correct information. The theme of adequate information and communication is rightly included in the circular health perspective. The distribution and amplification of inaccurate information across different platforms has demonstrably negative effects, often leading people to behave in harmful ways. The factors that might undermine appropriate communication include 1) the exponential increase of COVID-19-related publications, often including biases in the peer-review and editorial process; 2) the role of traditional media; 3) politicization of the virus; and, above all, 4) the impact of social media (19).

It is individuals and their behaviour that create the conditions in which an epidemic can be brought under control in the course of a few months (SARS, avian flu, MERS) or, conversely, cause it to explode and spread as in the current pandemic. Just consider how, with all the means of transport that we have at our disposal today, we have ourselves become highly effective “vehicles” for the spread of the virus. Paradoxically, “virtual” entities like (dis)information and social media could be the main drivers of a “real” pandemic. In other words, they could have far greater influence over its development than the virus factor (viral load, contagiousness, lethality) and even the human factor (genetic makeup, immune response) combined. By contrast, during

emergencies, accurate scientific communication should be able to provide clear messages to improve understanding and bring about changes in behaviour over a short period of time (20). If this approach is applied systematically, it has the potential to prevent future emergency situations from arising in the first place.

### **Conclusions**

As we said above, the conceptual framework of circular health must be followed up with new innovative practices and supported by consistency of political will that have been lacking in the past. Circular health requires a new way of thinking and acting for individual, collective and global health. As such it can be of great value in shaping further progress of sustainable health and development in the SEEHN countries as well as elsewhere.

A further point relates to the updating of educational curricula, so that future generations can absorb this new integrated mode and improve practice. Training in this area is essential to ensure that those currently responsible for taking political decisions fully understand that every choice they make in relation to human, animal and plant health as well as the health of the overall environment has impacts on all others. This is the birth of a new and important science offering a wealth of new opportunities to maximise impacts on sustainable development and health (21,22).

The challenge is to put circular health into practice through the governance that truly protects and promotes health, and that is no longer myopically restricted to human health alone. The involvement of civil society in this process of change is indispensable. Circular health represents an essential approach to the integrated management of public health. In other words, circular health takes account of and

includes the whole range of socio-economic and environmental determinants of health. These determinants characterise the potential to protect and promote health and decrease the inequalities that exist in this area. To this end, we must create a culture for health that more integrally involves society in all its different components (the voluntary and charity sectors, but also business and private enterprise). Fundamentally, health is universal and remains a common good.

Given the many social, economic, and cultural changes undergoing in the

countries of the South-Eastern European Network, the conceptual and policy framework related to circular health could be of great value in further advancing progress in this part of Europe. In the light of the lessons we are learning from the Covid-19 pandemic, the adoption of a circular health perspective is a necessity and an opportunity that can no longer be delayed.

NB: The content of this article is partially based on previous publications by the authors in Italian (12) and in Spanish (14)

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