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## Addressing the complexity of urban living: a new opportunity to improve public health

The paper by Diez Roux addresses the need to employ a systemic approach to understand urban health determinants, a basic condition for creating solid and positive public health policies. Cities are increasingly becoming human beings' natural habitat. Throughout history, urban living was consistently associated with adverse health conditions. Poor sanitation in crowded human settlements provided the perfect scenario for the development of cholera and other enteric diseases. In cities, yellow fever, smallpox, and bubonic plague killed millions of people. Cities also created the conditions for modern epidemiology after John Snow controlled a cholera outbreak in London by closing down a public water well [1]. Thus, cities have long demanded an ecosystem approach to improve public health, mostly focused on infectious diseases. Today's cities face new health problems, since chronic non-communicable diseases are more prevalent in urban areas and are modified by them. Mental illness, obesity, diabetes, cardiovascular disease, and cancer all display an urban-rural risk gradient [2,3,4]. To address these questions, health professionals are again facing the need to think and plan actions based on ecosystem premises. In fact, health should be considered a primary delineator of urban development and management, and health professionals must engage in the process of adding to Plato's utopian ideal city based on politics, ethics, and social relations, a fourth parameter: human health [5,6].

Worldwide, nearly 17.5 million people die per year from cardiovascular diseases [7]. Chronic non-communicable diseases have multiple factors (genetic, epigenetic, behavioral, and environmental). In this context, conditions that are more frequent in the urban setting such as air pollution, social stress, and climate changes (heat islands, for instance) should be considered important health determinants and included in the policymaking and planning process to effectively contribute to health promotion at all social levels.

Urban agglomerates are responsible for a large share of pollutants. To understand the urban process, we must view cities not simply as places in space but as systems of networks and flows. The "human ecology" concept includes a systems-based approach that enables an integrated view of the urban environment and public health [8,9].

According to William Rouse [10], the Earth is reflected as a collection of different systems on different scales: environment, population, industry, and government (Figure 1).

Let us explore, for example, the possible paths by which urban living contributes to cardiovascular disease. Cities experienced social and technological changes that ultimately created a dominant human habitat: long time spent in traffic, long working hours, airborne pollutants, stress, and easy access to high-fat/high-sugar/high-sodium foods combined with sedentary lifestyle and poor eating habits. These factors contribute directly or indirectly (by modifying) the risks of heart diseases.

From this perspective, air pollution has become part of modern living, and exposures are associated with numerous manifestations of heart disease, indicating that it not only exacerbates existing heart conditions but also appears to play a role in the development of diseases [11]. Air pollution ranks ninth among modifiable disease risk factors, and the risk of air pollution exceeds other well-known risk factors such as physical inactivity, high-sodium diet, high cholesterol, and drug use.

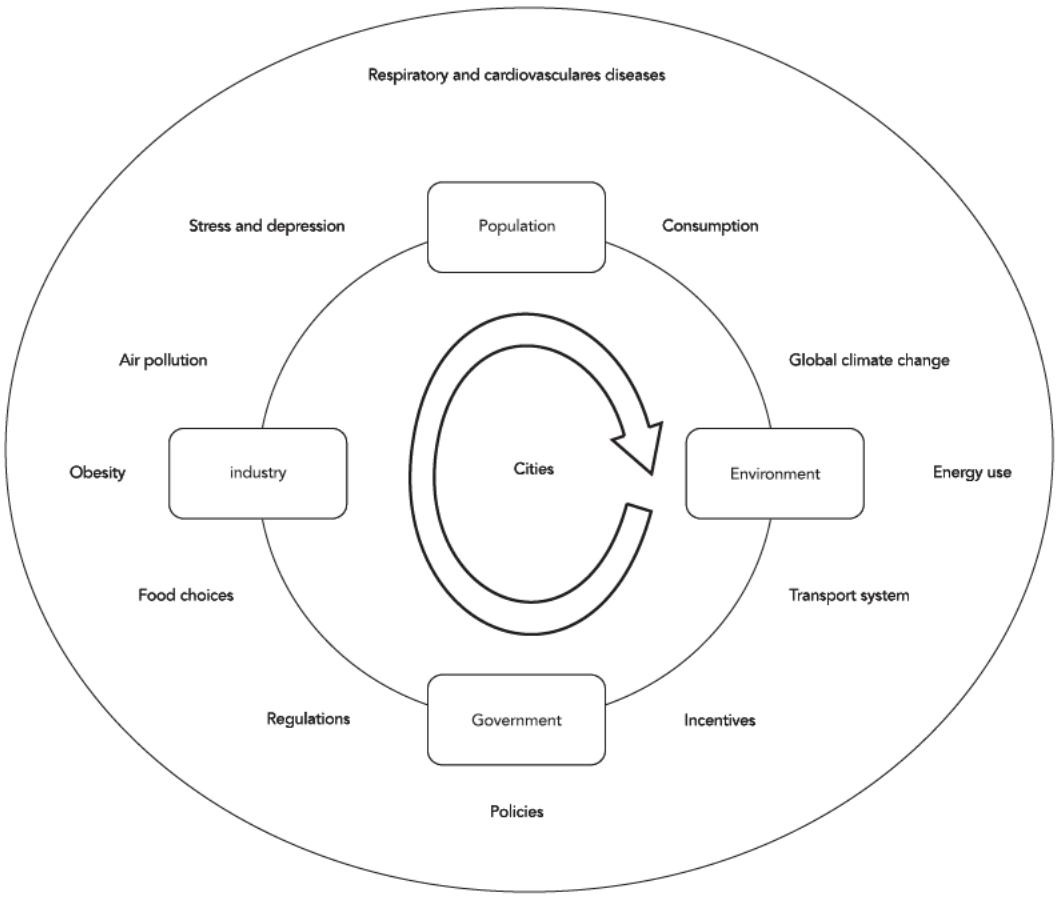
Moreover, the intensification of weather and climate extremes, the most visible impact of global warming on our everyday lives, can contribute to increasing the incidence of myocardial infarction, especially in the elderly [12,13].

Thus, in order to reduce the prevalence of cardiovascular disease, health professionals should face the complexity of the urban system, which encompasses factors not usually viewed as health determinants, such as urban planning, public transportation, and fuel policies. Other simulations could be developed for cancer, obesity, and diabetes, conditions influenced significantly by urban living.

Importantly, different factors (social, behavioral, physiological, environmental, psychological, and lifestyle) interact to determine and affect the health status of individuals and communities in a way that allows many opportunities for positive health interventions, for example, e.g. different public polices for the environment, transportation, and energy generation. This complexity of the urban scenario creates both challenges and opportunities. Diez Roux invites us as health professionals to incorporate a broader and more integrated approach when addressing health problems, so that her article is both timely and necessary.

Figure 1

A systems approach to cities includes four key elements: environment, population, industry, and government. Acting together, this approach allows an integrated view of direct and indirect health impacts.

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