

Poverty and urbanisation: an anthropogenic challenge on the spread of infectious diseases

Abstract :

We are living in the Anthropocene era where humans are having an increasing impact on their environment. Indeed, landscapes are increasingly modified by humans and are disturbing the environment. These habits have disrupted ecosystems and even the climate, which only a few decades ago seemed to be an unshakeable natural force.

At the same time, more and more infectious diseases have also been observed in humans. There is clearly a causal link between this human lifestyle and the development of infectious diseases. In order to define this link, it is necessary to understand how these diseases develop and what elements are necessary for their perpetuation. To understand the life cycle of infectious diseases as well as their consequences, this essay will focus on one particular type which is waterborne diseases and more specifically a snail-borne disease called *Schistosomiasis* also known as Bilharzia or snail fever.

Background :

Schistosomiasis is a snail-borne disease that affects more than 200 million people worldwide and can lead to liver and bladder fibrosis and infertility. It is responsible for approximately 180,000 deaths per year. Good treatments exist but there are no vaccines. This means that people can be reinfected by the disease. Its life cycle lasts between 3 and 5 months and relies on 2 types of hosts. The main hosts are humans, and the intermediate hosts are snails (Huyse, 2021).

The transmission cycle works as follows. The female in the blood vessels produces eggs containing larvae called *miracidium*. These eggs leave the blood vessels through the tissues and go into the bladder or intestine. The eggs are then passed through urine and faeces into the water. There they swim to an intermediate host, namely snails. In the snails they develop into secondary larvae. Once they are ready and there is enough light, they leave their intermediate host in search of a final host which are humans. They enter their final host through the skin and migrate to certain organs such as the liver and heart. There they develop and reproduce then move to the blood vessels where they release eggs starting the circle all over again (Gryseels, 2012).

This example highlights the fact that the geographical distribution of infectious diseases is influenced by a complex dynamic of environmental and social factors. The evolution of their impact is influenced by the effects on their vectors, intermediate hosts and reservoirs (Bhutta and all, 2014). There are multiple options for disease control that act on different stages of the transmission cycle. Firstly, it is possible to use drug treatment to cure infected people. Secondly, the use of engineering to build adequate sanitation facilities and clean water can respectively reduce the contact between the parasite larvae or eggs and people. Finally, it is possible to control the snail population through biological control or molluscicides (Huyse, 2021). The problem with these solutions is that they address the symptoms and not the causes of the spread of infectious diseases.

Moreover, these solutions are often given by external actors such as non-governmental institutions and are designed to contain a disease when there is an outbreak (Eisenstein, 2016). They do not address the core of the problem and do not anticipate the increasing urbanisation of cities where more and more people will come to live and where infectious diseases are becoming more prevalent. This paper aims to examine the root of the spread of infectious diseases, namely poverty, and to open the debate to find more holistic solutions. It first addresses the problem of urbanisation. This paper will then make the link between urbanisation and poverty, highlighting how one exacerbates the other. Finally, based on these observations, several possible solutions will be discussed.

Urbanisation and infectious diseases:

Today, urban expansion is most rapid in tropical countries, mainly in low-income regions, with one-third of the urban population in developing countries living in slums (ibid.). In Africa, it is expected to double, while in Asia it is expected to triple by 2050. The reasons for this growth will be multiple, including population growth, government policies, migration and other socio-economic forces, including globalisation. In the industrialised world, urbanisation has been synonymous with improved living standards and health. This is not the case in low-income countries, where health care and infrastructure have not kept pace with population growth (Alirol and all, 2011).

There are several reasons why these cities are so prone to disease. Firstly, they are densely populated cities and therefore there is greater proximity between people and the airspace they share. In addition, many migrants from rural and urban areas move to these cities. Those from rural areas may carry pathogens that can thrive and grow in urban environments. This is the case with *Schistosomiasis*, whose intermediate hosts, snails, can thrive in urban water sources and whose epidemics have been observed in several large cities in low-income countries. They can also increase the transmission of an existing disease by increasing the number of people carrying the pathogen. Finally, people coming from non-endemic areas can alter the epidemiology of the disease or trigger the spread of latent forms of the disease (ibid.).

Poverty and urbanisation:

In these slums, there is a critical lack of clean water and sanitation. Even when drinking water systems are set up, as for example in Kibera in Nairobi, because of poverty, people cut the pipes to sell the water. This contaminates the water and increases the risk of transmission of infectious diseases (Eisenstein, 2016). In other areas, people do not use sanitation for cultural reasons. This shows that the problem cannot be solved by providing facilities alone, and that the problem of poverty must be tackled at its source.

There is also a problem of waste management. In rural areas, waste is usually composted, recycled or burned, which is not the case in these urban areas. Waste accumulates in cities and can serve as a breeding ground for pathogenic hosts. Pollution from waste can also take precedence over infectious diseases (Alirol and all, 2011). As with sanitation and clean water, rethinking space and livelihoods in slums is necessary to solve the spread of infectious diseases.

A final aspect to highlight is that of inequalities in access to health. Access to health is often a function of certain socio-economic factors. First, people from slums encounters difficulties in cities in which the only way to access care is through private clinics, which require financial resources. Unfortunately, most people living in the poorer areas of the city do not have those resources. An aggravating social factor is the lack of education and illiteracy, which affects almost 20% more people in the slums than in the cities or the countryside. This results in less prevention and more disease in this population (ibid.). The link between poverty and infectious diseases is a vicious circle. The more people are affected by diseases, the less able they are to work and the more precarious they become (Alsan and all, 2011). This is why holistic solutions must be found to address this vicious circle.

Possible solutions:

These observations are all the more regrettable because cities are ideal places for disease management. This is where most of the financial resources are located and where decisions are made. The most efficient and cost-effective way to deal with infectious diseases would be to engage in dialogue with the inhabitants of these areas and find solutions to minimise the risks of transmission and improve the living conditions of the inhabitants (Eisenstein, 2016).

However, in the longer term, in addition to improving the living conditions in the slum, it should be ensured that they no longer exist. As more and more migrants come to the cities, the cities should be prepared to receive them. Newcomers should not have to live in overcrowded suburbs, in makeshift housing without facilities and health care. Cities should be planned with two objectives in mind. The first objective would be to improve existing slums and make them an integral part of the city. The second would be to plan cities in such a way that they can accommodate migrants while providing decent living conditions.

Conclusion :

Infectious diseases are transmitted in complex ways and there are many levers to control them. Some of these address symptoms such as drugs, sanitation and access to clean water, molluscicides and biological pest control. These are obviously necessary in the event of a disease outbreak. However, in view of urbanisation and globalisation, it is essential to rethink the planning of slums and cities in order to curb poverty and the transmission of infectious diseases by improving the living conditions of the inhabitants. This could be done by planning cities for the arrival of migrants while improving living conditions on the outskirts of cities in existing slums. The challenge now is to find a solution that combines the socio-economic factors of the territories concerned to overcome poverty and infectious diseases.

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