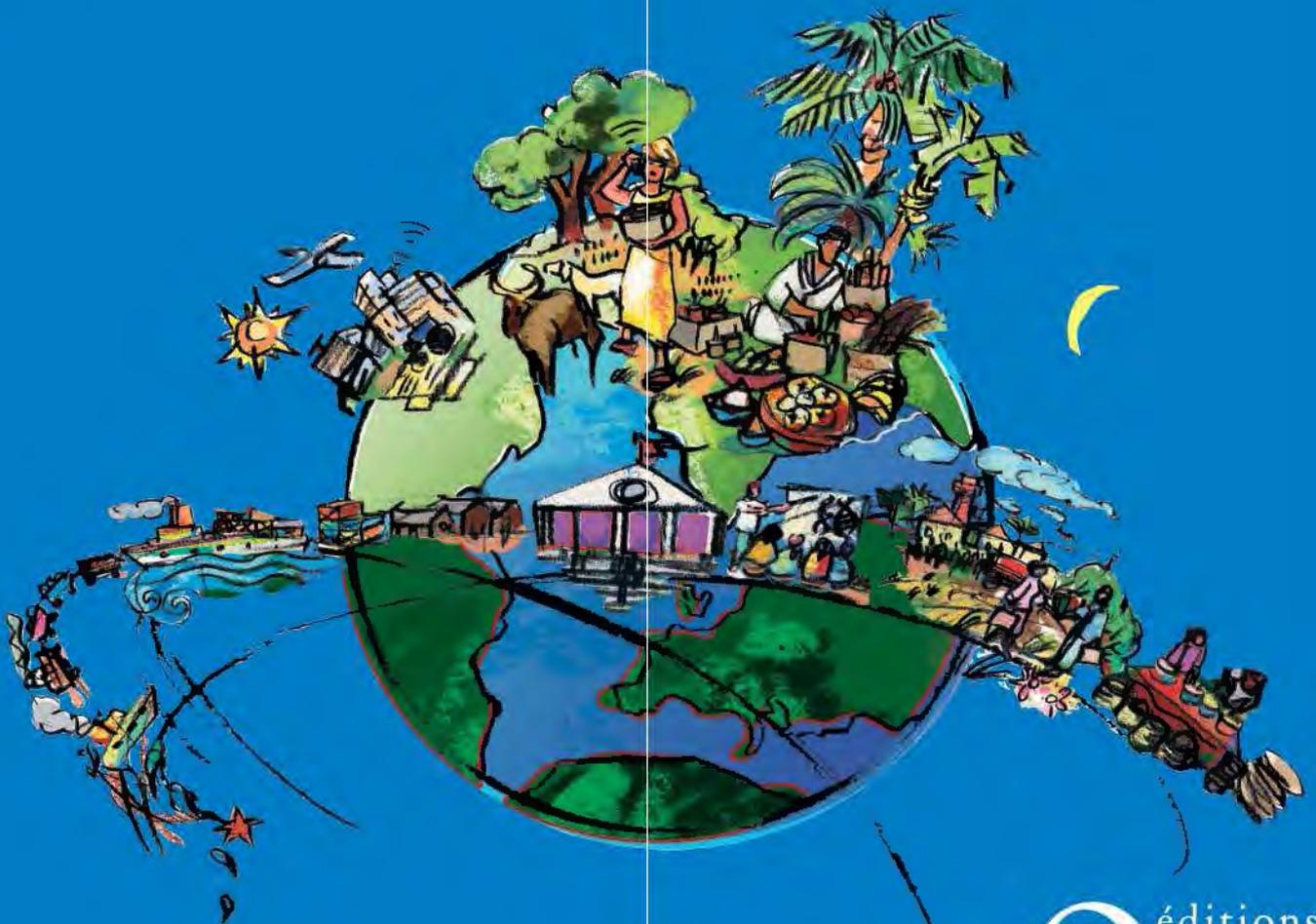




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Living territories to transform the world

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Geography of health: using territorial constructions to better manage human and animal health

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In this chapter, we explore different aspects of territorial dynamics pertaining to health management by using health surveillance examples. After recalling the importance of territorial dynamics to health, we will show the importance of managing health problems through territorial mechanisms and, consequently, demonstrate how essential it is to make these mechanisms part of national policies.

IMPORTANCE OF TERRITORIAL DYNAMICS IN THE MANAGEMENT OF HEALTH CONDITIONS

The social, economic and environmental changes taking place at different scales have an effect on people's attitudes and practices, their exposure to health risks and their perception of these risks. These changes lead to new lifestyles, new livestock farming practices, and the expansion of urbanization and agricultural spaces. They modify interactions between humans, domestic animals and wildlife, and lead to an increased risk of the emergence and spread of certain pathogens (Paplory, 2002; Jori and Bonnet, 2014; Caron *et al.*, 2013; Kukielka *et al.*, 2016).

A thorough understanding of territorial dynamics can improve the management of health issues. These dynamics are complex because they involve several sectors, environmental management, epidemiology, socio-economics of agricultural sectors, evolution of land use and demography, etc. To understand them, we have to rely on the geography of health taken together with spatial epidemiology based on a biological medical model by exploring the biological, social, cultural, historical and political factors that shape the management of health risks at the territorial level (Salem *et al.*, 1992; Dummer, 2008). This method combines quantitative and qualitative approaches, and uses complementary means for investigation and action,

such as geographic information systems and remote sensing, companion modelling, participatory epidemiology and medical anthropology.

The territorial approach, on the other hand, is based on the analysis of social, institutional and biophysical interactions, and highlights the spatial expression of health conditions and the resulting practices (location of health products and services, zoning, control strategies, etc.) (Salem *et al.*, 2012).

A territorial approach to zoonoses, diseases that can be transmitted from animals to human beings, thus takes into consideration the dynamics of the habitat of wild and domestic animals, and those of occupation of land by human populations. This analysis aims to monitor an epidemic by integrating spatial scales, social groups, risk factors and risk areas. It helps in the implementation of measures to prevent, monitor and control health problems. For example, the fight against certain parasitic food-borne diseases such as opisthorchiasis¹ requires an analysis with several dimensions, including the environmental (considering transmission mechanisms from snails to fish in the water), socio-economic (at the level of the fish farming sector), and cultural (pertaining to existing practices of consumption of raw food).

Finally, systemic approaches such as 'One Health' or 'EcoHealth' are required to tackle the globalized nature of many diseases, including zoonoses (Roger *et al.*, 2016a; Lesage, 2014). Such control measures call for synergy between actors from the different domains of animal health, public health and the environment, along with a coordinated monitoring of surveillance policies at all levels. The challenge is, in particular, to set up and support surveillance networks capable of providing early warnings, and to create the means required to understand the complexity of emerging health problems. Irrespective of whether the goal is to adopt a course of action or merely to understand processes or events, intervention at the territorial level is essential.

NATIONAL HEALTH POLICIES AND GLOBAL FRAMEWORKS CANNOT BE INDEPENDENT OF THE TERRITORY

A population's health depends on factors that transcend the local level. The recent emergence of Ebola in some African countries has highlighted the vulnerability of populations when national health systems are found wanting. This outbreak even led to borders being sealed to prevent the spread of the disease. However, the implementation of health regulations designed at international and national levels must take into account the practices and rationales of territorial actors and their historical contexts. In the case of Ebola, the geographical and anthropological analyses of local practices that generate zoonotic risks (hunting and food practices linked to land management and the organization of the bushmeat sector) or that promote human-to-human transmission (poor sanitation, mobility of villagers, social practices associated with funeral rites) has facilitated the development of locally adapted control strategies (Roger *et al.*, 2016b). The emergence zones, linked to contact between animals and human beings and to initial human-to-human transmissions are, in fact, localized and

1. Opisthorchiasis is a food-borne trematodosis, caused by the *Opisthorchis* parasite, a trematode ('fluke').

limited to the main area of the outbreak. An insight into these phenomena helps in developing efficient warning systems that can, in turn, allow the rapid detection of the disease and intervention to limit its spread.

Similarly, the monitoring mechanisms set up to control specific diseases, such as foot-and-mouth disease and avian influenza, which represent major international challenges (Roger, 2012; Figuié *et al.*, 2015), can function efficiently only with the participation of a group of key social actors, e.g., local chiefs and community leaders who, as local socio-political heads, are essential intermediaries for obtaining accurate and timely health information. In Thai villages, for example, social networks of duck and fighting cock breeders pass on strategic health information directly to community leaders, sometimes short-circuiting the official surveillance system, especially in cases of highly pathogenic influenza in poultry (Paul *et al.*, 2015; Figuié *et al.*, 2013). In Vietnam, private actors (agrifood companies, food and pharmaceutical vendors) have more timely access to local health information than do public authorities, and thus play a key role in health surveillance (Delaboughise *et al.*, 2015, 2016; Pham *et al.*, 2016). The private actors are the ones who organize local risk management and information dissemination programmes in the territory. Although veterinary authorities are well represented in these social networks, their role as supervisors is limited to keeping the Ministry informed about incidents of outbreaks on livestock farms and, if necessary, to carrying out culling operations. In such a context, the action of government veterinarians is limited in terms of co-management of health information with livestock farmers. It is the informal networks mentioned above that are the *de facto* reference entities for the dissemination of health information.

THE INCORPORATION OF TERRITORIAL HEALTH SYSTEMS IN PUBLIC POLICIES

Health is an intrinsic part of the dynamics of territories and can be both the cause and the consequence of their development. Leveraging territorial constructions to better manage human and animal health requires a clear understanding of health conditions and needs, as well as the harmonization of health policies with those of territorial planning. This approach not only takes into account intra- and inter-territorial interactions, but also helps in incorporating territorial considerations in national policies, especially for the purposes of recognizing and reducing health inequalities. Beyond a solely territorial approach, a linking of public policies to spatialized as well as ‘multi-location’² approaches (Cortes and Pesche, 2013) makes it possible to comprehensively address diverse threats to biodiversity, security, etc., as also health, which, not being bound by frontiers, has to be thought of in terms of networks and flows (Chapter 3).

The role of territorial constructions in the effectiveness of health policies is clearly reflected in national policies when it comes to changing risk behaviours. Coherence between local and national systems is therefore necessary. Indeed, even if global or

2. Approaches based on monitoring and recognition of health events and conditions in different geographical areas in order to compile and combine them, and possibly network them.

national level policies contribute to improving the behaviour and health of populations, their implementation can increase inequalities when prevention campaigns do not reach all territories, or are not well perceived or accepted by underprivileged populations. Recognition and articulation of territorial mechanisms and the taking of local realities into account help improve the formulation of national policies and, in particular, of awareness-raising campaigns.

In France, the local health diagnoses sought by territorial authorities for a better understanding of health inequalities and for adopting remedial measures are an apt illustration of this. For example, highlighting intra-urban disparities in access to breast and colorectal cancer screening in the Île-de-France region has led to lasting partnerships between academics (health geographers at the University of Paris-Ouest-Nanterre-la-Défense), associations of locally elected representatives, local authorities, cancer screening entities, the Île-de-France Regional Council and the Regional Health Agency. This knowledge transfer and co-production mechanism has led to the identification of several factors of unequal access to screening for these cancers, linked to the organization and functioning of territories (rationales of exchanges, barriers, segregation, etc.), and how different actors (residents, elected officials, institutions, etc.) appropriate and transform the territory (Vaillant *et al.*, 2012). It has thus contributed to the implementation of the French National Cancer Plan.

Furthermore, it is difficult to adopt a uniform approach to health surveillance on a national or regional scale and, here too, the adaptation of mechanisms to local specificities and the linking of territorial and national processes are essential. In the field of animal health, for example, the perception of risks associated with livestock activities differs depending on the actors, in particular for pandemic risks. We have seen that the networks of health sector actors are not necessarily in coherence with the configurations of the official national surveillance system. Livestock animals have financial, emotional, social or cultural values attached to them that determine how willing or reluctant the breeders are in implementing control measures, behaviour that is clearly evident during massive culling operations.

In conclusion, incorporating human and animal health mechanisms into the territory can help institute a governance of health risks in line with the interests of actors and policies adapted to a variety of contexts. To this end, the organization of health services and disease control efforts becomes more relevant when it is part of a systematic framework similar to One Health and which takes into account different aspects (environmental, agricultural, health, rural development, etc.) of territorial complexity.

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