Chapter 5

Environmental Change and the Emergence of Infectious Diseases:
A Regional Perspective from South America

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ABSTRACT

In South America in the past decades several infectious diseases have emerged or re-emerged either as part of larger pandemics or as local processes involving autochthonous pathogens. These included arthropod-borne viral diseases, such as Dengue Fever, Chikungunya and Zika as well as viral hemorrhagic fevers, such as Hantavirus Pulmonary Syndrome, Junin, Machupo and Guanarito viruses. Parasitic disease was also important such as Malaria, endemic in the northern part of the continent, Leishmaniasis and Chagas Disease. Carrion disease, a bacterial infection originally from the Andes region, also seems to be expanding geographically. Several social and environmental processes have contributed to the emergence of these pathogens, including human migration, deforestation, road and dam building and climate shifts. Due to its high biological diversity of wildlife, arthropods and virus species in still untouched natural ecosystems in the Amazon has the greatest regional potential for the emergence of new human infections.

INTRODUCTION

South America is at the Southern part of the America Continent (10ºN; 55ºS) spanning an area of 17,819,000 million km², which includes 12 countries and an independent territory (French Guyana). The regional climate is predominantly hot and humid, but subtropical climate is found in mountain regions (e.g. The Andes) and temperate and polar climates occur in the southern tip of the continent, in Chile and Argentina (Canziani & Dias, 1998).

There is a high diversity of ecological areas and ecosystems such as the desert areas in northern Chile; the large plains in Venezuela and Colombia and the vast Amazon forest, which is shared by eight countries. The region has the largest freshwater system in the world due to the network formed by the Prata, Orinoco and Amazon River basins (Comisión Económica para América Latina y el Caribe [CEPAL], 2014).

The regional population is about 410 million people with about 83% living in cities. The regional life expectancy reached 73 years in 2010 (Teixeira, Paixão, & Costa, 2013). According to the Pan-American Health Organization [PAHO] (2014), safe water access reaches 89% of people in the Andes. However, this is not consistent across the region. Bolivia has sewage collection and treatment covering only 46% of households. Gross income per capita ranged from US$12,470 for Chile and Argentina to US$7,784 in Andean countries. Between 1990 and 2010, regional infant mortality rates dropped by 50%; for Brazil it was 14,6/1000 and for Chile 7,8/1000, in 2012 (PAHO, 2014; Teixeira et al., 2013).

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