There are no translations available.

By Dr. Mary Wilson, Adjunct Associate Professor of Global Health and Population, Harvard School of Public Health, USA, and author of the book ’A World Guide to Infections: Diseases, Distribution, Diagnosis’ (New York: Oxford University Press).

Maps have magical properties. They convert all kinds of data into colors, shades, shapes, and figures, and display them in a spatial framework. Map-making involves planting data on drawings of contours of land masses or representations of geographic regions. Maps are an ancient and common form of communication. Maps enable us to see where we are and identify many attributes of people, places – really any characteristic of the biosphere - by geographic location. Maps can convey large volumes of information, tell stories, and help to answer questions. Here we have an atlas, a collection of maps. As someone with in inordinate fondness for maps, I take great pleasure in this book.

The topic of the spatial distribution of diseases – and how and why this changes – has been one of endless fascination for me. Thus it was a joy for me to be contacted by someone else who also has a passion for this topic – for “understanding the special preferences of infectious agents for specific niches and hosts”. Even better, Heiman Wertheim, who has led this project, has had the energy, creativity, and vision to pull together a book that assembles material that is essential for trying to make sense of the patchwork of infectious diseases globally. It is not an easy task to do even the first part – to create maps showing where diseases exist – or rather, where they have been reported in the past. Most maps showing disease distributions found in textbooks are old, based on incomplete data, and often out-of-date by the time they are printed. Disease distribution is dynamic because of the inherent properties of life and its interaction with the abiotic environment, and it is difficult to provide maps that accurately capture the current situation.
Important as it is, it is not enough just to know where diseases have been if one is trying to understand why diseases exist in some locations or populations and not in others. Understanding disease distribution requires input from multiple disciplines, and knowledge of microbiology and pathology is only a part of this. For this atlas, the authors have identified many of the critical environmental, ecoclimatic, and economic factors that influence the distribution of diseases. Some diseases can be transmitted only in focal areas because of the need for specific ecoclimatic conditions or a specific arthropod vector or an intermediate or reservoir host. But even pathogens with a global distribution are spread unevenly among regions or populations. For these diseases it is useful to know the geographic areas or populations at highest risk for infection. By also studying maps of features called drivers of disease – or by superimposing locations of cases on maps that display other characteristics, such as rainfall, for example, one can begin to identify some factors that may limit exposure or may predispose to specific infections. These maps provide important tools for spatial analysis to characterize risks of exposures or of outbreaks. Maps in this volume include ones showing features of the human population (e.g., size, urbanization, economic status, access to clean water and sanitation, nutrition, genetic factors), ecoclimatic conditions (e.g., climate, elevation, mountain ranges, rainfall, type of land cover or terrain), other life (e.g., arthropod vectors, livestock). Other important drivers or combinations may emerge that are relevant for future

analyses. The current maps show key attributes of people and places that influence the likelihood of exposure and vulnerability to infection or to poor outcome.

Even a casual review of the distribution of many of the diseases leads to the conclusion that areas that share two attributes, hot and poor, are disproportionately affected by infectious diseases. Species diversity (including that of organisms pathogenic for humans) increases at lower latitudes and decreases at higher latitudes, at greater distance from the Equator, the species latitudinal gradient. Many developing countries are also found in low latitude areas, regions at particularly high risk for infectious diseases. Poverty increases contact between pathogens and people through multiple mechanisms. Much of the global population growth today and projected for the future is in developing countries in low latitude areas.
Even if we have maps that perfectly depict the global situation today, things change. The pace of change in new infectious disease events has picked up in recent decades. We are seeing known diseases in new geographic areas (e.g., chikungunya virus infections); spread of pathogens that are more antibiotic resistant (e.g., MDR-and XDR-TB), virulent, or transmissible; the identification of new pathogens (e.g., SARS coronavirus). We humans are changing the epidemiology of infectious diseases at a brisk clip. Humans transport other life – macroscopic and microscopic - and change the Earth in ways to create fertile soil for the sustenance of microbes and their transmission. We have also created conduits for expanded and novel transmission events – transmission of cryptosporidium to large populations through municipal water supplies; transmission of prions, viruses, such as West Nile virus, protozoa such as Trypanosoma cruzi (the cause of Chagas disease), and other microbes through organ and tissue transplantation. Old diseases change – especially in becoming resistant to antimicrobials - in large part because of our inappropriate application of drugs for treatment. There are many reasons to believe that these changes in infectious diseases events will continue and perhaps increase, driven by global travel and trade, high population size and density (humans and farmed animals), extensive contact between animals and humans, including markets in bushmeat, farms raising wild animals in large numbers for food and other products, the massive global market in exotic pets and expansion of human populations into new geographic areas.

This magnificent book helps to show where diseases are and helps us start to understand factors associated with that location. The authors reviewed an extraordinary amount of material to create these maps, many for diseases for which no maps or only crude ones existed. Many of the maps are unique and draw on data not previously used to develop maps.
This book provides a wonderful structure, the scaffold, on which to add more data – or from which to jettison outdated material. The maps reflect the best available information, but the available databases are incomplete. The book provides a framework and an impetus for researchers and public health workers to add data to fill in the gray areas. The current collection is an excellent beginning. Even in geographic areas where good data are available, distributions may expand and contract – so maps will require continued updating. The maps also provide a useful research tool that will allow investigators to test a variety of hypotheses with respect to factors that drive disease location. This may allow projections about where a disease might appear, because of the constellation of attributes of the people, place, and other species present, even if cases have not been documented in that area. The sheer volume of data required is daunting because it is relevant to have knowledge of vectors, reservoir hosts for many diseases as well as data about the physicochemical and ecoclimatic environment. Maps

of other drivers can be added, as they are found to be relevant for specific pathogens.
This first edition is an auspicious start to a project that will never be finished. The maps can be improved and will change over time, but will never be final.

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