

Figure 1.5 Cases of Cholera in the Soho District of London, England, 1854. Adapted with permission from: L. D. Stamp, *The Geography of Life and Death*, Cornell University Press, 1964.

When the pandemic that began in 1842 reached England in the 1850s, cholera swept through the Soho District of London. Dr. Snow mapped the Soho District, marking all the area's water pumps—from which people got their water supply for home use—with a P and marking the residence of each person who died from cholera with a dot (Fig. 1.5). Approximately 500 deaths occurred in Soho, and as the map took shape, Snow noticed that an especially large number of those deaths clustered around the water pump on Broad Street. At the doctor's request, city authorities removed the handle from the Broad Street pump, making it impossible to get water from that pump. The result was dramatic: almost immediately the number of reported new cases fell to nearly zero, confirming Snow's theory about the role of water in the spread of cholera.

Dr. Snow and his colleagues advised people to boil their water, but it would be a long time before his advice reached all those who might be affected, and in any case many people simply did not have the ability to boil water or to wash hands with soap.

Cholera has not been defeated completely, however, and in some ways the risks have been rising in recent years rather than falling (Fig. 1.6). People contract cholera by eating food or water contaminated with cholera bacteria.

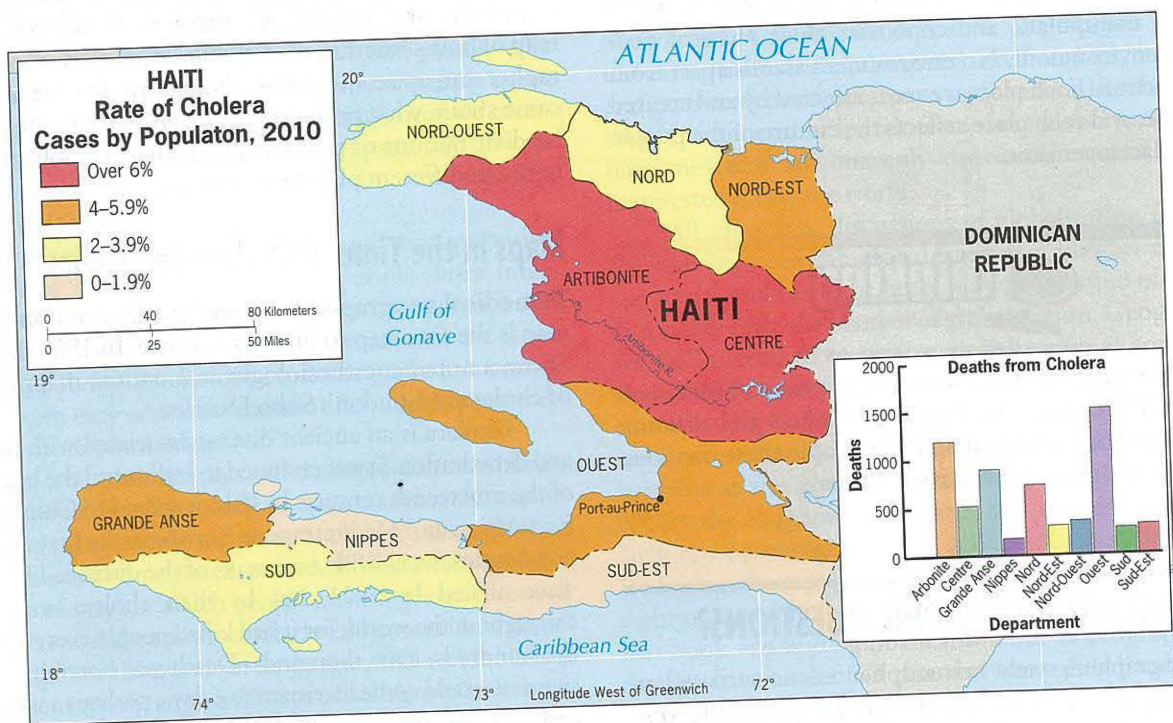


Figure 1.6 Cholera in Haiti, 2010. Artibonite and Centre departments have been hard hit by the cholera outbreak in Haiti, in part because the Artibonite River is contaminated by cholera bacteria and in part because of the large number of Haitians displaced from Port-au-Prince who have fled to camps in Artibonite and Centre. Data from: Centers for Disease Control, 2011. http://www.bt.cdc.gov/situationawareness/haiticholera/map_1.asp

Cholera bacteria diffuse to broader areas because once one person has cholera it can be spread through his or her feces. In an impoverished area with no sanitary sewer system, the person's feces can easily contaminate the water supply. Even in places with sanitary sewer systems, cholera contamination occurs when rivers, which are typically the water supply, flood the sanitary sewer system.

We expect to find cholera in places that lack sanitary sewer systems and in places that are flood prone. In many of the teeming shantytowns of the growing cities of the developing world, and in some of the refugee camps of Africa and Asia, cholera remains a threat. Until the 1990s, major outbreaks remained few and limited. After remaining cholera-free for a half century, Europe had its first reappearance of cholera in Naples in 1972. In 2006, a cholera outbreak in Angola, in southern Africa, spread quickly throughout the country. When heavy rains came to West Africa in 2010, an outbreak of cholera killed 1500 people in Nigeria alone.

A cholera outbreak in the slums of Lima, Peru, in January 1991 became a fast-spreading epidemic (regional outbreak of a disease) that touched every country in the Americas, infected more than 1 million people, and killed over 10,000 in the region. The outbreak in Peru began when the ocean waters warmed off the coast of Peru. Cholera bacteria live on plankton in the ocean, and the warming of the ocean allowed the plankton and cholera to multiply. Fish ate the plankton, and people ate raw fish, thus bringing cholera to Peru.

In the slums of Peru, the disease diffused quickly. The slums are densely populated and lack a sanitary sewer system large enough to handle the waste of the population. An estimated 14 million Peruvians were infected with cholera, 350,000 were hospitalized, and 3500 Peruvians died during the outbreak in the 1990s. Peruvians who accessed health care received clean water, salts, and antibiotics, which combat the disease.

In January 2010, an earthquake that registered 7.0 on the Richter scale hit Haiti, near the capital of Port au Prince. Months later a cholera outbreak started in the Artibonite region of Haiti (Fig. 1.6). Health officials are not certain whether the outbreak began in the multiple refugee camps or elsewhere. The disease diffused quickly through the refugee camps and by October 2010 reached the capital city of Port au Prince. Scientists worry that the cholera outbreak in Haiti will be long lasting because the bacteria have contaminated the Artibonite River, the water supply for a large region. Although purifying water through boiling and thoroughly washing hands prevent the spread of cholera, water contaminated with cholera and a lack of access to soap abound in many neighborhoods of world cities. A vaccine exists, but its effectiveness is limited, and it is costly. Dr. Snow achieved a victory through the application of geographical reasoning, but the war against cholera is not yet won.

The fruits of geographical inquiry were life-saving in Snow's case, and the example illustrates the general advan-

tage that comes from looking at the geographic context of events and circumstances. Geographers want to understand how and why places are similar or different, why people do different things in different places, and how the relationship between people and the physical world varies across space.

The Spatial Perspective

Geography, and being geographically literate, involves much more than memorizing places on a map. Place locations are to geography what dates are to history. History is not merely about memorizing dates. To understand history is to appreciate how events, circumstances, and ideas came together at particular times to produce certain outcomes. Knowledge of how events have developed over time is thought to be critical to understanding who we are and where we are going.

Understanding change over time is critically important, and understanding change across space is equally as important. The great German philosopher Immanuel Kant argued that we need disciplines focused not only on particular phenomena (such as economics and sociology), but also on the perspectives of time (history) and space (geography). The disciplines of history and geography have intellectual cores defined by these perspectives rather than by subject matter.

Human geographers employ a **spatial perspective** as they study a multitude of phenomena ranging from political elections and urban shantytowns to gay neighborhoods and folk music. To bring together the many subfields of human geography and to explain to non-geographers what geographers do, four major geographical organizations in the United States formed the Geography Educational National Implementation Project in the 1980s. The National Geographic Society published their findings in 1986, introducing the **five themes** of geography. The five themes are derived from geography's spatial concerns.

The Five Themes

The first theme, **location**, highlights how the geographical position of people and things on Earth's surface affects what happens and why. A concern with location underlies almost all geographical work, for location helps to establish the context within which events and processes are situated.

Some geographers develop elaborate (often quantitative) models describing the locational properties of particular phenomena—even predicting where things are likely to occur. Such undertakings have fostered an interest in **location theory**, an element of contemporary human geography that seeks answers to a wide range of questions—some of them theoretical, others highly practical: Why are villages, towns, and cities spaced the way they are? A geographer versed in location theory might assess where a SuperTarget should be