Tracking the AIDS Epidemic in the United States: Diffusion through Space and Time

INTRODUCTION

Places can affect other places through a process called spatial diffusion. It is the spread of some phenomenon over space and through time from a limited number of origins. Phenomena take the form of ideas, innovations, products, new technology, culture traits, and contagious diseases. At first glance, comparing the spread of agriculture at the dawn of civilization to the spread of dress styles, popular music, or a new strain of flu virus may seem like comparing apples and oranges. Upon more careful analysis, however, geographers have discovered that all phenomena that diffuse, no matter how dissimilar, share some general spatial patterns and processes.

There are two types of diffusion: relocation diffusion and expansion diffusion. Relocation diffusion occurs when the items being diffused leave the original areas behind as they move to new areas. People move to a new area and take their language, religion, and other cultural items with them, as in the case of African-Americans who moved from the rural South to the urban North during the mid-twentieth century and brought blues music to Chicago and of contemporary Mexicans who migrated to America and brought Mexican cuisine with them. Although cultural traits are carried with the people who move, the number of adopters stays the same—at least initially.

Expansion diffusion is the process whereby the item spreads geographically by passing from one person to another while remaining with the first person. In this case, the number of people adopting the item expands. The phenomenon being diffused often intensifies in the origin region as new areas are affected by the phenomenon. An example of this type is the diffusion of a new strain of hybrid rice in India or the diffusion of AIDS in the United States, the topic of this chapter.

Relocation diffusion is often followed by expansion diffusion, depending partly on how much the new residents interact with the preexisting population. After African-American migrants brought the blues north, and Mexican migrants brought tortillas and salsa north, these cultural traits spread beyond the black and Mexican populations to other Americans. In addition to food, migrants bring countless other cultural traits with them, such as religion, technology, and even sports. Europeans brought Christianity with them to the New World (relocation diffusion), where it
spread to native peoples (expansion diffusion). Likewise, settlers carried guns with them to the American and Canadian West (relocation). Native American peoples witnessed the effectiveness of firearms firsthand and quickly acquired guns for themselves (expansion). The British are credited with inventing several of the world’s most famous sports, including soccer, golf, and cricket. While soccer and golf spread throughout the world, cricket gained popularity mainly in the United Kingdom itself and the former British colonies that make up the British Commonwealth (Figure 3.1). The British have played cricket since at least the sixteenth century, with the first recorded rules in the Code of 1744. British colonists and soldiers played cricket wherever they went, and while it spread to the local populations, its complexity and leisurely pace may have prevented it from spreading to areas that were never settled by the British.

The adoption of phenomena generally follows an S-shaped curve (Figure 3.2). Take the case of cellular phone purchases as an example. Initially, only a small number of purchases were made because very few people knew about the product, and few distributors offered it for sale. Later, the number of adopters grew exponentially as the early buyers spread the word through a large, susceptible population (people who could afford but had not yet purchased a cellular phone). During this middle phase, the majority of people who will eventually adopt do so. Ultimately, the rate of adoption will taper off as the remaining number of susceptible people shrinks and the novelty and excitement of cellular phones wears off. The number of cell phone subscribers in the United States is still growing rapidly (Figure 3.3), but will eventually have to taper off as it approaches the total U.S. population of just over 300 million. The level of adoption never quite reaches 100 percent. Even in the most modern and wealthiest societies, there will always be people who choose to live without telephones and electricity. In addition, many products and diseases taper off at levels much lower than 100 percent, for example, snowboards, colored contact lenses, hip-hugger jeans, and the flu. If the saturation level is low, say at 10 percent of the population, the innovators might constitute the first 1 percent, the majority adopters from 2 to 9 percent, and the laggards the last 1 percent.

![Figure 3.1](image) Cricket is especially popular in India, Pakistan, Australia, and the British West Indies. This group of formerly British islands in the Caribbean Sea had one of the best squads of the late twentieth century. International matches can take five days to play.
The S-curve also applies to innovations introduced by businesses and governments (Figure 3.4). A technology with the potential to transform the twenty-first century, but still in its infancy, is the hydrogen-powered vehicle. Hydrogen vehicles, which emit only water vapor from the tailpipe, can reduce urban smog, slow global warming, and lessen our dependence on imported oil. But which will be commercialized first: hydrogen vehicles or refueling stations? To break this chicken-and-egg dilemma, government agencies in partnership with automobile and energy companies are seeding an initial refueling infrastructure so that consumers and businesses will be able to use hydrogen vehicles as they become commercially available. As Figure 3.4 shows, there are now over 200 stations worldwide, with most growth occurring in Europe and North America. What you see in Figure 3.4 is the very beginning of an S-curve that might someday—if technology keeps improving and costs keep coming down—level off at over a million stations worldwide. In comparison, the first gasoline station was built in 1907, and the United States alone now has...
Cumulative Hydrogen Refueling Stations

Figure 3.4 Hydrogen, which has been used as a fuel in the space program for many years, is the most common and lightest element in the universe but is not found in its pure form in nature. Currently, it is most cheaply made from natural gas (CH₄) using a process called steam reforming, but the vision for the hydrogen economy is to generate electricity from renewable sources such as solar or wind power, and then use this electricity to generate hydrogen from water (H₂O) using a process called electrolysis. The hydrogen can then be shipped and stored for use when and where it is needed. Hydrogen vehicles will use either an internal combustion engine to burn hydrogen or a fuel cell to generate electricity for a quiet but powerful electric motor. Most hydrogen stations today deliver compressed, pressurized hydrogen to the vehicle's fuel tank.


There are an estimated 175,000 stations. In the United States, hydrogen fueling stations are diffusing most rapidly in California, which has a history of forward-looking measures to combat its severe air pollution.

How is it that some people adopt an innovation, purchase a new product, or catch a disease earlier than others? Where you live has something to do with when the diffusing phenomenon reaches you. The diffusion process has two spatial regularities. The first is a contagious effect, which says that places near the origin are usually affected first (Figure 3.5a). The farther you are from the point or points of origin, the later you will be affected. Think of a pebble tossed in a pond. The ripple spreading through the water is akin to the contagious effect in diffusion. This process is strongly influenced by distance because you are more likely to come in contact with nearby persons than with more remote persons. Contagious diffusion tends to characterize things that spread via direct contact or communication with, or observation of, another individual. Illnesses and slang spread rapidly among schoolmates, while farmers often rely on neighbors for proof that new equipment or seeds are better than the old. The spread of Islam from its birthplace in Mecca in what is now Saudi Arabia is a good example of contagious diffusion at work (Figure 3.6).

Diffusion processes do not, however, always follow the rule of distance. Sometimes distance is less important to the spread of an idea or disease than contact with major cities or influential people. Hierarchical effects occur when phenomena spread first to major cities, then to intermediate-size places, and later to small towns and rural areas (Figure 3.5b). New clothing and music fads, for example, spread quickly among major world cities such as New York, Los Angeles, London, Paris, and Tokyo. Only later do they filter down the urban hierarchy, in other words, down from large cities to smaller places (see Chapter 9 for a complete

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discussion of urban hierarchies). This occurs for several reasons. First, larger places have a greater potential for interaction. Far more travel and contact occur between large cities than between smaller cities, due in part to their complex air, road, and communication links. With more carriers of ideas coming to a place, large cities have more interactions with other people and places and, therefore, are first to find out about new styles and trends (you will see the effects of size on the number of interactions in Chapter 4). Second, the people in larger cities tend to be more diverse, wealthier, and more accustomed to change; cities attract more risk-taking
persons. Third, the same can be said for the industries in larger cities. They also tend to be more diverse and more able and willing to adopt new technologies and practices.

A classic example of hierarchical diffusion is the spread of radio broadcasting in the "Roaring 20s." From an initial set of cities (Pittsburgh, Detroit, Los Angeles, Seattle, and Oklahoma City) in 1920, radio diffused to a total of 126 small, medium, and large cities by 1924. In this case, the limiting factor was the need for a large enough audience within a limited broadcasting range to make it worthwhile to invest in transmission equipment and a tower. Half a century later, the musical genre of "punk rock" diffused hierarchically from its breeding grounds in New York and London to the next set of cities such as Cleveland and Los Angeles in the United States, and Belfast and Manchester in the United Kingdom. The hierarchical diffusion of punk rock in the 1970s relied on a different mechanism than the diffusion of radio did in the 1920s. Trendsetting musicians including Iggy Pop, Lou Reed, David Bowie, The New York Dolls, The Ramones, The Clash, and The Sex Pistols were attracted to cosmopolitan cities such as New York and London (Figure 3.7). They traveled frequently between New York and London, cross-fertilizing new music, and they found a market for their avant-garde music in these cosmopolitan cities.

It can be difficult to disentangle contagious and hierarchical diffusion because both are usually at work in any real situation. One indicator of which diffusion process is dominant is the extent to which the innovation skips over large areas in jumping from city to city (hierarchical) versus the extent to which it spreads from place to place like a wave (contagious). Also, to qualify as hierarchical diffusion, larger cities should have a disproportionately higher number of cases than do

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smaller cities; that is, they should have a higher adoption rate per person. If a city of 1,000,000 people had only 10 times as many cases as a city of 100,000 people, there would be no evidence of hierarchical diffusion.

Above and beyond the contagious and hierarchical effects, the spatial pattern of diffusion is influenced by barriers to diffusion. These barriers can be physical in nature, such as rivers, oceans, lakes, and mountain ranges; or they can be cultural. Language barriers thwart the easy flow of ideas and fads from the United States and English-speaking Canada to French Canadians in Quebec. Similarly, a political boundary can impede or slow down the dissemination of disease. Economic factors play a role if people in a certain place cannot afford to purchase a new commodity.

Cultural and social factors can also facilitate diffusion. Geographically varying acceptance of gay lifestyles and differing intravenous drug-use rates influence the diffusion of the AIDS epidemic in the United States. On a global scale, Thailand, with an exploitative but legal prostitution industry (so-called sex tourism), has a high AIDS rate, whereas China, with more conservative attitudes toward sex and less contact with the West, has a lower rate.

The purely spatial model of diffusion has been criticized by some geographers. These critics talk about biased innovations that diffuse according to social context rather than spatial context. Biased innovations are less accessible to people of a certain gender, class, ethnicity, or age, or less appropriate for them. Many people simply cannot afford expensive innovations and are denied loans to purchase them, even if the products would help them to be more productive (e.g., computers, chemical
fertilizers for farming, anti-HIV drug "cocktail"). Others lack the necessary education, which in turn can be gender based or class based. In some countries, girls lag 20 to 30 percent behind boys in school enrollment, and poor children in some countries are taken out of school and put to work. In some countries, women are denied access to normal channels of information, and the elderly have low literacy rates. The concept of biased innovations can be extended to diseases that strike different groups of people unequally.

This chapter asks you to look for evidence of contagious and hierarchical effects in the spread of AIDS in the United States. What were the early origins of the epidemic? What paths did it follow? Do there appear to be any barriers to diffusion of the epidemic? Understanding the geographic spread of this disease will help to plan for its effects and to predict (and hopefully dampen) the course of future epidemics.
CASE STUDY

TRACKING THE AIDS EPIDEMIC IN THE UNITED STATES

GOAL
To see how ideas, behavior, products, technology, and disease spread through time and across space as illustrated by the spread of AIDS in the United States.

LEARNING OUTCOMES
After completing the chapter, you will be able to:
- Define and give examples of hierarchical diffusion.
- Define and give examples of contagious diffusion.
- Interpret a scatter diagram.
- Interpret animated maps that change over time.
- Calculate cumulative totals and make a cumulative graph.
- Describe the diffusion of AIDS in the United States.

SPECIAL MATERIALS NEEDED
- Computer with high-speed Internet access and a recent release of a Web browser. If using the Student Companion Site with the printed book, click on Tech Support for system requirements and technical support. (If using the e-book in WileyPLUS, click on Help for details about the system requirements.)

BACKGROUND
You may never have considered geography and the medical sciences to be related, but in fact they have an old partnership. In particular, the subfield of epidemiology is the study of how disease spreads. Geographers have long considered the spread or diffusion of phenomena across space.

AIDS remains a major health concern around the world. It is estimated that 30 to 40 million people have died from the disease, including over 2 million in 2007. Another 33 million are currently infected with HIV/AIDS, of whom 2 million are children. In fact, nearly 1 percent of all adults ages 15 to 49 in the world are living with HIV, including 0.6 percent of Americans and 0.4 percent of Canadians. About 2.7 million people contract HIV each year, or about 7,400 per day. Globally, half of all people infected with HIV are women. About 95 percent of new infections occur in less-developed countries. More than 16 million children have been orphaned by AIDS worldwide. Another 4 million people will likely die of AIDS in the next two years.

Acquired immunodeficiency syndrome (AIDS) is caused by the human immunodeficiency virus (HIV). HIV is a retrovirus that attacks T4 lymphocytes, white blood cells that are an integral part of the body’s immune system. People with AIDS usually die of opportunistic diseases such as pneumonia, tuberculosis, and certain forms of cancer. Opportunistic diseases use the opportunity of a depleted immune system to take hold. Until the recent introduction of potent and expensive new drugs called protease inhibitors, AIDS was usually fatal within 10 years. In much of the developing world, however, these drugs are too expensive or unavailable.

HIV is transmitted via bodily fluids. Because of a very long incubation period (time between infection and appearance of distinctive symptoms), the HIV virus spreads undetected for many years, resulting in seeding for a worldwide AIDS pandemic. In the United States, homosexual males and intravenous drug users are among those most commonly infected. Infants born to women infected with HIV and people who received blood transfusions before blood was screened for HIV also have disproportionately high infection rates.

The origins of HIV have been traced to Africa, but how this disease originated remains unknown. Two strains of HIV have been co-circulating in Africa, HIV-1 originating in East-Central Africa and HIV-2 in West Africa. Virologists did not identify HIV-1 and HIV-2 until 1982 and 1985, respectively. Simian immunodeficiency viruses (SIVs) found in wild monkey populations in Africa bear similarities to HIV; particularly HIV-2. The occurrence of HIV-2 is also highly correlated with the habitat of the sooty mangabey, the monkey with the closely related SIV. The source of HIV-1 has been more difficult to identify, but many point to a related SIV in chimpanzees as the most probable source. The earliest documented HIV-1 infection is a man in Kinshasa, Congo, in 1959. Researchers measuring the rate of genetic change of HIV believe that current strains evolved from SIVs in about 1931. We do not know how these SIVs passed from monkeys to humans (a process called zoonosis), but cross-transmission of blood from animal populations, perhaps by people butchering monkeys for meat, is most likely. A more controversial interpretation has been that polo vaccines administered in the 1950s were made with kidneys from infected chimpanzees and led to the zoonosis from SIV to HIV. Although several researchers still believe this to be a possibility, subsequent testing of the original vaccine found no trace of the virus. The relatively late date of the vaccinations also makes this interpretation less likely.

No matter how the disease spread to humans, it might have remained an isolated event in rural African villages had not rural-to-urban migration and trade routes spread the virus throughout sub-Saharan Africa from its origins in East Africa (HIV-1) and West Africa (HIV-2). AIDS in Africa largely has spread through and relocation diffusion processes. Heterosexual transmission, the dominant mode in Africa, has led to alarming rates of HIV infection—as high as 39 percent of the adult population of Botswana, and 5 million people in South Africa alone.

Several factors have contributed to the African AIDS. First, as a result of postcolonial development patterns (see Chapter 7), many African men looking for jobs have choice but to leave their wives and children behind to live in male-only hostels in mines, plantations, and cities. Prostitution typically thrives in these kinds of situations, and many men inadvertently spread AIDS to their wives or girlfriends on their few trips back home every year. Second, abject poverty, famine, war, and other perils often threaten a much more imminent demise than the delayed risk of contracting AIDS. Many African prostitutes complain of no other means of feeding their starving children. Third, ignorance and misinformation about AIDS and AIDS prevention is
rampant, and traditional cultural taboos often enforce a code of silence surrounding the entire issue.

AIDS is having a devastating effect upon the development of many sub-Saharan countries, shortening life expectancies by 30 to 50 percent to as low as 30 years (Figure 3.8). Unlike diseases that tend to target infants and the elderly, AIDS kills sexually active adults in the prime of their lives. This increases the ratio of dependent population (children and elderly) to the labor force while requiring more workers and resources for the health care industry. This double whammy adversely diverts a country's labor force, savings, and resources away from other pressing needs such as agriculture, industry, education, transportation, and services. In Zimbabwe, a country of about 13 million people in southern Africa, more than 780,000 children have been orphaned by the AIDS epidemic. Many are forced to stop their educations and go into migratory labor or prostitution to feed themselves and their younger siblings. Annual basic care and treatment for a person with AIDS can cost as much as two to three times per capita gross domestic product (GDP) in the poorest countries. There will likely be 65 million deaths because of AIDS in the 45 most affected countries between 2000 and 2020, more than five times the death toll of AIDS in the previous two decades in those countries.

Young women are the hardest hit in Africa. In sub-Saharan Africa, 76 percent of young people living with HIV are female. They are four times more apt than men to contract AIDS during heterosexual sex, they progress to full-blown AIDS faster, and they die sooner. Because of unequal economic and social power relations between the genders, women often cannot control when and with whom they have sex, let alone insist that their partner wear a condom (Figure 3.9).

For the first time, the rate of new infections in sub-Saharan Africa stabilized in 2000. Some countries, such as Uganda and Senegal, have been successful at slowing the diffusion of

![Figure 3.8](image.png) Projected population for Botswana in 2020 with and without the AIDS epidemic. Each horizontal bar shows the population (labeled on the vertical bars) for five-year age groups (labeled on the left axis). Notice that by 2020, the 30- to 55-year-old age brackets—composed of today's 15- to 35-year-old young adults—will be decimated, creating a society devoid of middle-aged expertise and leadership and a generation without parents.

![Figure 3.9](image.png) A Tanzanian woman stricken with AIDS with her son and a nurse.
Tracking the AIDS Epidemic in the United States

ACTIVITY 1: MAPPING THE DIFFUSION OF AIDS

A. To start your activity, click on the Student Companion site at www.wiley.com/college/kuby. (For students using WileyPlus, log on to your class Web site, select the Assignment tab, locate and click on this assignment, and follow all instructions.)

B. Select this chapter from the drop-down list and then click on Computerized Chapter Activities.

C. Click on Activity 1: Mapping the Diffusion of AIDS.

On the map of the United States, you can visualize the diffusion of the AIDS epidemic across the country by changing the year with the slider bar below the map. You will be mapping the rate of AIDS cases per 100,000 population reported from 1986 to 2003, an 18-year span. Each metropolitan area appears on the map when it exceeds the threshold of 100 cases per 100,000 people. All metro areas are highlighted with a black diamond in the first year they appear and then convert to a blue square for subsequent years. Metro area names can be identified by “mousing over” the black diamonds in the year they appear. Notice that for the first year, 1986, only the metro areas of New York and San Francisco appear. They were the only two metro areas with more than 100 AIDS cases per 100,000 people in that year.

At any time, you can click on the Population icon to turn on a graduated circle map of metropolitan area populations, in green. You may also click on AIDS Rate/100,000 People to see graduated circles in red that change from year to year as the AIDS rate of each metro area changes.

You need to consider many geographical factors as you study the maps and graphs of the spread of AIDS in the United States. First, the most vulnerable populations (homosexuals and intravenous drug users) are not equally distributed throughout the United States but tend to be more prevalent in certain kinds of locations. Second, as you saw in Chapter 2, regional cultures differ across the United States. Third, cultural differences can be related to the size of a place. Fourth, you must consider the amount and types of movement of people between the initial source regions and secondary places, keeping in mind that once AIDS has spread to a new place, the new place becomes a potential source region. Unfortunately, the data tell us only where AIDS appears, not which places infected which other places.

D. With the entire U.S. map visible, slide the bar back and forth to see the diffusion through U.S. metro areas across the 18-year time span.

E. Click on Top 15 Metro Regions. The boundaries of the 15 most populous metropolitan regions in the United States in 1990 (see box) are highlighted in red. See whether there is a relationship between when a metro area passes the 100-cases-per-100,000-people level and whether it is in one of the largest metropolitan regions of the urban hierarchy. Please note: it is sometimes hard to tell whether certain cities fall within a Top

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15 metro region because they lie very near the CMSA boundary. If you are not sure if the black diamond is in a metro region, try going to the following year when the large black diamond will change to a smaller blue square—the smaller symbol will make it easier to determine which side of the boundary the city is on.

As each metro area appears, determine whether it is within one of the 15 largest metropolitan regions.

Metropolitan areas are functional regions defined and ranked by the U.S. Census Bureau. They are composed of a central “downtown” or “nucleus” county plus all surrounding nonagricultural counties that are connected to the nucleus via intercounty commuting patterns. Cities such as Atlanta that have only one central nucleus are defined as a standard metropolitan statistical area (MSA). Sometimes metropolitan areas overlap with each other and merge together. The Census Bureau recognizes these cases by defining consolidated metropolitan statistical areas (CMSAs) that are made up of smaller component metro areas called primary metropolitan statistical areas (PMSAs). For instance, the New York CMSA in 1990 was made up of 15 PMSAs stretching from the Monmouth–Ocean, NJ, PMSA to the New Haven, CT, PMSA (see Chapter 10 for more information about census-defined metropolitan areas).

The Top 15 layer shows MSA or CMSA boundaries (which we call metropolitan regions), and the dots that appear on the map represent the central cities of MSAs or PMSAs (which we call metro areas). Boundaries for 1990 are shown because they are most representative of conditions during the crucial early stages of diffusion.

1.1. How many metro areas of each population level are added to your map in each year? (The first two rows are already completed to guide you.)

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<th>Year</th>
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1.2. In the table on the previous page, does the sequence of small and large metro areas over time provide evidence for hierarchical effects in the diffusion of AIDS? Explain.

1.3. Miami, Florida, had a 1986 population of 1,769,500. Seattle, Washington, had a 1986 population of 1,751,100. Seattle crossed the 100-per-100,000 threshold in 1991; Miami did so in 1988. Why did Miami have such a high early rate of AIDS? (Hint: Refer to Figure 3.10.)

1.4. San Francisco, California, had a 1986 population of 1,588,000. San Jose, California, had a 1986 population of 1,401,600. Both are part of the Bay Area CMSA (ranked #5). San Jose crossed the 100-per-100,000 threshold in 1993, and San Francisco did so in 1986. Why did San Francisco have such a high early rate of AIDS?
1.5. Go back to the national map and move the time slider slowly back and forth between 1985 and 2003. Do you see any particular barriers blocking AIDS diffusion or pathways promoting it?

1.6. In Question 1.1, you should have found several metro areas not within the Top 15 that appeared on the map between 1986 and 1990. Go back to the national map and identify them and write their names here.

1.7. At first glance, it might seem that these smaller metro areas with early high rates of AIDS do not fit the hierarchical diffusion pattern of big cities first and small cities later. What is it about the locations of the metro areas in Question 1.6 that might explain their earlier-than-expected AIDS outbreaks? (Going back to look at Figure 3.5 might help you.)

F. When you have finished the activity, proceed to Activity 2 to continue. Otherwise, close all browser windows.
Tracking the AIDS Epidemic in the United States

ACTIVITY 2: AIDS RATES AND DISTANCE FROM INITIAL CENTERS

AIDS diffusion prior to 1986 is not well documented, but we know that concentrations of reported AIDS cases in the early 1980s were in New York, San Francisco, and Miami, as well as Los Angeles, Houston, and Denver. Here we examine the relationship between the AIDS rate and distance from three regional source cities: New York, Miami, and San Francisco. Select the metro area that is closest to your college or that is assigned by your instructor and answer questions about the relationships you see.

A. To start your activity, click on the Student Companion Site at www.wiley.com/college/kuby. (For students using WileyPlus, log on to your class Web site, select the Assignment tab, locate and click on this assignment, and follow all instructions.)

B. Select this chapter from the drop-down list and then click on Computerized Chapter Activities.

C. Click on Activity 2: AIDS Rate and the Distance from Initial Centers.

D. Click on the metro area you wish to examine: New York, San Francisco, or Miami.

DISTANCE FROM THE INITIAL CENTERS

You can now see a scatter diagram that plots the AIDS rate in 1986 against distance from New York City (or Miami or San Francisco, depending on your choice) for 46 nearby metropolitan areas. A scatter diagram depicts the relationship between two variables. One variable (distance) is measured on the x-axis (horizontal), and another (AIDS rate) is measured on the y-axis (vertical). The placement of the dots tells you the x and y values for the place in question (see Figure 3.13). As you move the cursor around, red crosshairs that move along the x- and y-axes show you the x and y values of the tip of the cursor arrow. Try “mousing over” any of the dots to see a temporary window with the name of the metro area the dot represents, the population, and the distance from the source city (x) and AIDS rate (y) for that metro area. The scatter diagram is a “scatter” of these dots, which show groupings or trends in the relationship between the two variables. Note that the source city (New York), at distance = 0, is on the y-axis.

A best-fitting, smoothed blue curve through this scatterplot shows the general trend in the relationship between the AIDS rate and distance. A horizontal red line shows the 100-AIDS-cases-per-100,000-population threshold above which metro areas appeared on the map in Activity 1.

E. Slowly move the slider to the right to see the graph interactively change over an 18-year time period. Pay attention to how the graph changes, particularly the line of best fit.

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