Health Effects of Transportation Policy

ch. 1

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ABSTRACT >> *There is a deep and evolving knowledge base about the links between transportation and health. Research shows that when properly designed, transportation systems can provide exercise opportunities, improve safety, lower emotional stress, link poor people to opportunity, connect isolated older adults and people with disabilities to crucial services and social supports, and stimulate economic development. Conventional auto mobility-focused planning by local, regional, and state transportation agencies generally overlooks or undervalues the impacts of transportation investments on health and equity.*

This chapter provides an overview of the impacts of transportation on health. Subsequent chapters on transportation options and key issues provide further detail.

Introduction

Our current transportation system has many direct health consequences: pollution-related asthma, steep declines in physical activity, and the associated rise in obesity and chronic illnesses are just a few examples. Transportation affects health indirectly by connecting people—or by failing to provide connections—to jobs, medical care, healthy food outlets, and other necessities. The National Surface Transportation Policy and Revenue Study Commission—created by Congress in 2005 to examine the condition and future needs of our network of highways, ports, freight and passenger railroads, and public transportation systems—reached a sobering conclusion: "The nation's surface transportation network regrettably exacts a terrible toll in lost lives and damaged health."[1] Nowhere is the toll higher than among low-income people and people of color.

Direct Health Effects

Pollution

Pollutants from cars, buses, and trucks are associated with impaired lung development and function in infants[2] and children,[3] and with lung cancer,[4] heart disease, respiratory illness,[5] and premature death.[6] Long-term exposure to pollution from traffic may be as significant a threat for premature death as traffic crashes and obesity.[7] In California alone, pollution is a factor in an estimated 8,800 premature deaths a year.[8]

The main culprits are fine particulate matter, including diesel exhaust particles; ground-level ozone, a toxic component of smog formed when tailpipe emissions from cars and trucks react with sunlight and oxygen; and nitrogen oxide (NOx), which contributes to the formation of ozone and smog. The health risks are exacerbated by transportation patterns that often embed heavy traffic and diesel-spewing facilities in poor and predominantly minority neighborhoods. The American Lung Association has found that 61.3 percent of African American children, 67.7 percent of Asian American children, and 69.2 percent of Latino children live in areas that exceed air-quality standards for ozone, compared with 50.8 percent of white children.[9] Ground-level ozone, a gas, can chemically burn the lining of the respiratory tract.

Air pollution is also "one of the most underappreciated" triggers of asthma attacks, according to the Centers for Disease Control and Prevention (CDC).[10] More than 20 million Americans—roughly seven percent of adults and nearly nine percent of all children—have asthma. In poor and minority communities, the rates are considerably higher. For example, in Harlem and Washington Heights in northern Manhattan, home to mostly low-income African American and Latino residents, one in four children suffers from the disease.[11] Research shows that air pollution can trigger the wheezing, coughing, and gasping for breath

that signal an attack in people with asthma. But a study in 10 Southern California cities raises the troubling possibility that pollution can also lead to the onset of the disease. The study found that the closer children live to a freeway, the more likely they are to develop asthma.[12]

Environmental justice activists have called attention for years to the connections among pollution, illness, and transportation policy—and the burden on communities of color. For instance, in the mid-1990s, West Harlem Environmental Action (WE ACT) used mapping, air monitoring, and resident surveys to show that the neighborhood's asthma rates were linked to its dubious status as the diesel capital of New York City. When WE ACT began work on the issue, Harlem housed six of the city's eight bus depots and 650 Port Authority buses. The group played an important role in getting the city to convert buses to clean fuel.[13]

Pollution from freight transport is another big concern around the country. To meet America's insatiable demand for goods, ports and highways are continually expanding to accommodate more ships, locomotives, and trucks. Ports frequently border low-income and minority neighborhoods, and highways often run through them. The upshot: some of the worst emitters of fine particles, soot, and greenhouse gases (GHGs) are a growing presence in already vulnerable communities.

Climate Change

GHGs are not pollutants in the classical sense. They cause the atmospheric changes and resulting climate disruptions that are projected to alter the natural and built environments on which society relies.[14] The health risks come largely from those environmental alterations. In a major shift in federal policy, the Environmental Protection Agency in April 2009 adopted the position that greenhouse gases pose a danger to human health and welfare. A few weeks later, the Climate Change and Health Protection and Promotion Act, H.R. 2323, was introduced in the House of Representatives.[15] The bill would direct the Department of Health and Human Services to develop a national strategic action plan to prepare for and respond to the health effects of climate change.

Researchers are just beginning to assess the specific health dangers in the United States; most of the published data to date come from abroad. A recent report predicts that kidney stones, linked to dehydration, may increase by as much as 30 percent in the driest regions of the United States.[16] So far, however, there are more questions than answers. How will less rainfall affect the potential for waterborne diseases? Food supplies? Food prices? How will extreme weather conditions such as heat waves or hurricanes affect mental health? Physical activity? Population displacement?

Scientists believe that climate change could exacerbate a number of current health problems, including heat-related deaths, diarrheal diseases, allergies, and asthma.[17] Those already at highest risk—the poor, minorities, children, and older adults—will be even more vulnerable. Policy neglect would compound the problems. Hurricane Katrina revealed, to a horrified public, the disastrous results that can occur when nature (the sort of extreme storm that experts expect to occur more frequently as the earth's temperature changes) combines with government disregard (in this case, the poorly maintained levees that failed to protect New Orleans from catastrophic flooding) as well as resource inequities (the lack of transportation, which made evacuation impossible for thousands of people).

The urgent need to reduce GHGs has catapulted transportation policy into the limelight. The United States has only about five percent of the world's population but contributes nearly 25 percent of GHGs, mainly because of fossil fuel consumption, motor vehicle emissions, and industrial agricultural practices (which themselves are promoted by our transportation system).

Improving vehicle technology, while important, is not enough. Americans need to drive less. That will happen only if walking, bicycling, and public transportation become feasible, efficient alternatives to driving in many more communities, and if land use patterns are changed so people no longer have to jump in the car for every trip.

Physical Activity

Sixty percent of adults in the United States do not meet recommended levels of physical activity, and 25 percent are completely sedentary.[18] African Americans and Latinos are less likely than whites to get enough daily physical activity.[19] The links between physical activity and health are well established. Sedentary lifestyles are estimated to contribute to as many as 255,000 deaths each year.[20] Many children and teens are already at risk for heart disease and type 2 diabetes, once considered "adult" ailments. Today's youth may turn out to be the first generation in modern history to live shorter lives than their parents.[21]

Physical inactivity is an important factor in the rising rates of obesity and chronic disease—and transportation practices strongly influence physical activity habits. The more time a person spends in a car, the more likely he or she is to be overweight. Conversely, higher rates of walking and bicycling are associated with lower rates of obesity. A 2004 study found that every additional hour spent in a car is associated with a six percent increase in the likelihood of obesity, and every additional kilometer walked is associated with a 4.8 percent reduction.[22]

There are many ways to be physically active, but quite a few require time, skill, and money. Walking and bicycling not only for recreation but also for transportation are the most practical ways to improve fitness. They are often the only viable option for low-income residents who live in neighborhoods without parks, who cannot

afford gym memberships, and who do not have the luxury of leisure time.

People who use public transportation tend to walk to and from bus stops and train stations, increasing their likelihood of meeting physical activity recommendations.[23] Residents of compact neighborhoods walk, bike, and use public transportation more than residents of spread-out communities, and they have lower rates of obesity.

Mental Health

Rush-hour gridlock, long waits for the bus, and arduous commutes are stressful. They take time away from family, friends, and the activities that provide emotional sustenance: hobbies, religion, sports, clubs, civic engagement, and volunteer commitments. Every 10 minutes spent commuting is associated with a 10 percent drop in the time spent traveling for social purposes.[24]

Many people find commuting by high-quality public transportation to be less stressful than commuting by car. As we discuss below, the financial costs associated with long commutes

exacerbate the stress, particularly in low-income households.

Safety

Traffic crashes are a leading cause of death and injury for Americans in the prime of life.[25] In 2000, motor vehicle crashes cost $230.6 billion in medical costs, property damages, lost worker productivity, travel delays, and other expenses.[26] That figure equals about half of all spending on public education from kindergarten through 12th grade.

Native Americans die in traffic crashes at more than 1.5 times the rate of other racial groups.[27] African Americans drive less than whites but die at higher rates in car crashes. Walking, too, is also more dangerous in communities of color. CDC data in the mid-1990s revealed that the pedestrian death rate for Latino males in the Atlanta metropolitan area was six times greater than for whites.[28] African Americans make up 12 percent of the U.S. population but account for 20 percent of pedestrian deaths.[29]

Inequitable transportation policies and resources contribute to these disparities. Low-income people and people of color have fewer resources to buy products that improve safety, such as late-model cars and new child safety seats. In underinvested neighborhoods, poorly designed streets, neglected road maintenance, inadequate lighting, limited sidewalks, and minimal traffic enforcement place residents at higher risk of injury.

Safety is also a huge concern for older adults—the fastest-growing segment of the population—and for rural residents. Driving skills decline with age, and frailty makes older adults especially vulnerable in a collision.[30] They are more likely to be killed or injured in a crash of a given severity than any other age group.[31] Older adults also walk slower and are more susceptible to pedestrian injuries.

Although less than a quarter of all driving in the United States takes place in rural settings,[32] more than half of all motor vehicle crashes occur there.[33]

The more we drive, the more likely we are to get hurt or die in a crash; there is a strong positive relationship between per capita vehicle miles traveled and traffic casualty rates.[34] Communities with high annual mileage tend to have higher traffic death rates than communities where people drive less. Passengers on buses, light rail, and commuter rail have about one-tenth the traffic death rate as people in cars.

Investments in public transportation and walking and bicycling infrastructure can reduce injuries and deaths. Contrary to popular belief that more walkers and cyclists lead to more casualties, greater numbers of walkers and bicyclists actually decrease the risks.[35]

Indirect Health Effects

Transportation is a lifeline. We depend on it to get to work, school, the doctor's office, the bank, the supermarket, the gym, or a friend's house. People without reliable, efficient, affordable ways to get around are cut off from jobs, social connections, and essential services. Access to transportation, to economic and social opportunity, and to resources for healthy living are inextricably linked. Gaps in all three areas feed on one another in complex ways. Policy reforms that put health equity objectives at the center of transportation planning and funding decisions can reduce these inequities.

Transportation, Income, and Health

As housing and jobs have moved farther apart, the distance has created employment barriers for anyone without unlimited ability to drive. Nineteen percent of African Americans and 13.7 percent of Latinos lack access to automobiles,

compared with 4.6 percent of whites. Poverty complicates the problem: 33 percent of poor African Americans and 25 percent of poor Latinos lack automobile access, compared with 12.1 percent of poor whites.[36] Cars owned by low-income people tend to be older, less reliable, and less fuel-efficient. This makes commuting to work unpredictable and more expensive, at best.

Income is an important determinant of health.[37] The association between poverty and poor health is well documented. Jobs with good wages, including those in the transportation sector, are essential to sustaining health.

Transportation impacts not only family earnings but also expenses. The cost of getting around takes a significant bite out of household budgets. The general standard holds that a family should spend no more than 20 percent of income on transportation, or the costs will eat into other necessities, such as nutritious foods and medical care.[38] The average family in the United States spends about 18 percent of after-tax income on transportation, but this varies significantly by income and geography. For example, low-wage households (earning $20,000 to $35,000) living far from employment centers spend 37 percent of their incomes on transportation.[39] In neighborhoods well served by public transportation, families spend an average of nine percent.[40]

Older Adults and People with Disabilities

More than one in five Americans ages 65 and older do not drive because of poor health or eyesight, limited physical or mental abilities, concerns about safety, or because they have no car. More than half of nondrivers, or 3.6 million Americans, stay home on any given day—and more than half of that group, or 1.9 million, have disabilities.[41] Isolation is especially acute in rural communities, sprawling suburbs, and black and Latino communities. Compared with older drivers, older nondrivers take 15 percent fewer trips to the doctor; 59 percent fewer trips to shops and restaurants; and 65 percent fewer trips for family, social, and religious activities.[42]

When affordable, high-quality public transportation and safe, walkable streets are available, older adults take advantage of them. More than half of older adults make walking a regular activity. More than half of older nondrivers in dense communities use public transportation at least occasionally, compared with one in 20 in spread-out communities.[43]

The Americans with Disabilities Act (ADA) of 1990 significantly expanded transportation options for people with disabilities. ADA required public bus and rail operators to provide accommodations, such as lifts and ramps, to enable people in wheelchairs to ride. But street design in most communities makes traveling to and from bus stops challenging—and often unsafe—for people with disabilities. Paratransit systems, which use vans or shared taxis to transport people door-to-door, are helpful, but many systems are stretched thin and require appointments well in advance.

Conclusion

Transportation and health: until recently, policymakers, government officials, advocates, and indeed, most Americans thought of these as distinct realms. But research shows that how we get around and how we transport goods and services have a profound impact on individual, community, and public health. Further, inequities in transportation resources contribute to the pronounced health disparities in the United States and to the growing income gap between the affluent and the poor. An overarching transportation policy that does not seriously consider public health, environmental quality, and equitable access will inevitably damage all three. Health and equity must be at the center of transportation planning and investments.

Notes

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