Health and Globalization

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How Does Globalization Relate to Health?

It isn’t difficult to imagine how increases in international commerce and in the movement of people—two defining features of globalization—might influence health. More goods go more places today than at any point in history. More people travel farther more frequently and come in contact with more people and goods than at any point in history.

This increased movement of goods and people increases opportunities for the spread of disease around the world. And it’s not just goods and services that can travel across oceans and state borders—so can diseases like AIDS, malaria, or tuberculosis. The outbreak of BSE, or “mad cow disease,” in several European countries is only one example of how trade can promote the spread of dangerous diseases. The mosquitoes that carry malaria have been found aboard planes thousands of miles from their primary habitats, and infected seafood carrying cholera bacteria have been shipped from Latin America to the United States and Europe.

But just as globalization increases the frequency and ease with which diseases can move around the world, it also can improve access to the medicines, medical information, and training that can help treat or cure these diseases.

Drug companies and governments now have the ability to ship drugs to remote parts of the world affected by outbreaks of disease. Institutions and professionals seeking to put medicines or other treatments in the hands of needy people can now make use of the new product distribution networks, communications technologies, and transportation technologies that have promoted globalization over the past decade.

Diseases and Human History

Long before anyone had conceived of globalization, travel by people and the transportation of goods across regions of the world contributed to the spread of infectious diseases. In fact, a great deal of human history has been written by disease. In the second century A.D., measles was spread between Rome and Asia along caravan routes. In the following century, the trade routes were responsible for carrying smallpox, which wiped out as much as one-third of the population in affected areas.

The next truly massive epidemic occurred in the 13th and 14th centuries, when Mongol horsemen carrying infected fleas brought bubonic plague from northern Burma to Eastern Europe, and then rats helped carry the disease throughout the rest of the continent. All of the travel and trade taking place in Europe made the continent a veritable petri dish for infectious disease.

After enduring wave after wave of epidemics, the disease-hardened descendants of these caravan traders, horsemen, and sailors brought about an unprecedented human catastrophe when they began traveling to the Americas after 1492. The indigenous population of North and South America, which had lived in comparative isolation, then became victim to perhaps the greatest mass loss of life in human history.
In the two hundred years following the arrival of Columbus in the Americas, historians estimate that the Indian population of the Americas declined by 95 percent (from a total population of perhaps 100 million), mostly due to imported diseases. The new microbes brought by Europeans included smallpox, measles, typhus, diphtheria, chicken pox, and influenza.

Soon afterward, Europeans began the African slave trade into the Americas, bringing laborers to replace the many indigenous people who died. And with the trade ships and human cargo that crossed the Atlantic came new epidemics of diseases from Africa, including malaria, yellow fever, and dengue fever.

The opening of the Americas by Europeans beginning at the end of the 15th century created, for the first time in the world, a substantial economic linkage between Europe, North and South America, and Africa. Some health authorities have also referred to this as the "microbial unification of the world" (Berlinguer cited in Aginam).

Diseases "Go Global"

According to one estimate, by the time of the European colonization of the Americas, plagues such as smallpox and measles could travel around the world within the span of a year. Today, of course, with international air travel, an infected person can carry a disease from almost any point of the globe to any other point in less than 36 hours.

One of the particularly threatening aspects of this compression of time is that people can now cross continents in periods of time shorter than the incubation periods of most diseases. This means that, in some cases, travelers can depart from their point of origin, arrive at their destination, and begin infecting people without even knowing that they are sick.

The new ease with which infectious diseases can be transmitted globally is having a direct and dramatic effect on morbidity and mortality around the world. In the United States, for example, the incidence of infectious, disease-related deaths has been increasing by roughly 4.8 percent per year since 1980, bringing the number of deaths up to 59 per 100,000 by 1996, which translates into 170,000 U.S. deaths annually. This increase follows nearly a century of long-term, steady decline in the number of deaths from infectious diseases in the United States.
Newer statistics by the United Health Foundation illustrate that, within the United States, there has been a 45 percent decrease in the incidence of infectious disease between 1990 and 2007. However, according to the World Health Report 2007, worldwide infectious diseases are currently spreading faster and emerging quicker than ever before: "Since the 1970s, new diseases have been identified at the unprecedented rate of one or more per year." In 2002, deaths from infectious diseases world wide reached 14.9 millions, which is 26 percent of all deaths around the world (Source WHO).

Similarly, in the United Kingdom, which had almost completely eradicated tuberculosis from the British Isles by 1953, 8,000 new cases of the disease are reported annually.

The dangers posed by these diseases go beyond simply medical concerns. In 2008, Pentagon Reports (Storming Media) issued a report, describing the vast consequences of the global spread of infectious disease. The report testified that: The global community has suffered recently from newly emerged infectious diseases, including HIV/AIDS and severe acute respiratory syndrome (SARS), and from reemerging diseases once thought to be in decline. Additionally, it is increasingly recognized that infectious disease can pose a significant threat to U.S. and world security. To best understand and mitigate this threat, U.S. policy makers require adequate and timely information about the occurrence of infectious disease worldwide.

The threat of political instability—which can be defined as wars, ethnic conflict, and violent regime transitions—is most likely to endanger developing countries. In these nations the burden of disease can strain already meager national budgets, set off competition for resources, and result in the death or disability of important government officials.

**Infectious Diseases and Global Public Health**

What accounts for this resurgence of infectious disease? The past century has brought about tremendous change in human societies, weaving the world's population together every more inextricably. The transition from subsistence farming to industrialization also has generated profound change in social and cultural relationships, and altered many people's relationship with their natural environment. All of these factors have had implications for global health.

The most important ways that infectious diseases have been affected by globalization include:

- Increased Global Travel
- Increased Trade in Goods
- Food-borne Illnesses
- Urbanization
- Climate Change
- Other Environmental Concerns
- Microbial Drug Resistance
- Breakdowns in Public Health Systems
Increased Global Travel

In 1993, it was estimated that 500 million people crossed international borders on airplanes. By the year 2001, that number had risen to 689 million per year. According to the World Tourism Barometer, “international tourism arrivals expanded by 6 percent in 2007, to 898 million international tourist arrivals, as compared to 2006.” This includes more than one million people who travel every week between developed countries and developing ones. In the same way that ancient caravans and seagoing vessels carried illnesses from city to city, modern transportation systems do the same thing, only at a vastly greater speed. According to the World Tourism Organization (WTO), by 2020, the number of people crossing international borders is expected to increase even more, exceeding 1.5 billion per year.

An example of this rapid diffusion could be seen in the early 1990s, when a particularly dangerous strain of streptococcus pneumoniae, first detected in Spain, was subsequently tracked to have spread throughout the world within only a few weeks (NIE, 2000).

Increased international travel is also believed to have played a major role in the spread of HIV/AIDS. Some virologists suspect that the HIV virus originated in West Africa, and had been present there at very low levels for perhaps as long as one hundred years before the disease reached epidemic proportions and was officially isolated by scientists in 1983 (Krause). And with the building of the trans-continental highway from Point-Noire, Zaire (now the Democratic Republic of Congo) to Mombasa, Kenya, came vast new opportunities for the spread of the disease.

Epidemiologists speculate that truck drivers along this highway carried the virus into the general population. Many scientists also believe that several years later, a highly promiscuous Canadian flight attendant who traveled regularly across North America was single-handedly responsible for a significant number of the early cases of AIDS in the western hemisphere (Shilts, 1987).

Global travel is a factor not only because of the increased dispersion of contagions, but the transit itself can often contribute to the spread of disease. Many health professionals are concerned that the confined, recirculated air on airplanes may pose a significant threat to passengers for contracting diseases such as tuberculosis, which is both airborne and extremely contagious.

It is important to note that the transmission routes of infectious diseases do not run exclusively from poorer countries to richer ones. In fact, when measured in terms of the impacts on populations, the reverse is more likely to be the case. Historically, when people of developed countries begin to come into contact with traditional or developing societies, it is the health of the traditional or developing people that tends to be impacted most severely.

Increased Trade in Goods

In the same way that increased global travel by people makes it easier for pathogens to spread around the world very quickly, the increased transit of goods also creates new opportunities for the transmission of disease.
The tropical disease dengue, which causes severe pain in the bones, high fever, chills, vomiting, diarrhea, and severe exhaustion, infects up to 100 million people each year, mostly in urban areas in the tropics. However, the disease has been picked up and spread widely by several especially hardy breeds of mosquitoes, bringing the illness to many new populations.

The Asian tiger mosquito has found a new home in the Western Hemisphere, bringing dengue with it, and the insect can now be found from Latin America to as far north as Chicago. The mosquitoes thrive in small pools of water such as flowerpots, gutters, birdbaths and plastic covers, and are believed to have been originally transported around the world by shipments of used tires.

The worldwide trend toward urbanization is also believed to have propelled the spread of dengue. Epidemiologists have tracked the disturbing growth of this epidemic in the Western Hemisphere:

- Small outbreaks of dengue have been reported in several American cities, including Houston, over the past decade
- A large outbreak struck Puerto Rico in 1994, sickening 20,000 people.
- A more severe illness associated with multiple exposures to dengue, known as dengue hemorrhagic fever, spread rapidly in Latin America over the last two decades. The World Health Organization (WHO) reports that in 2007 alone, there were over 26,000 reported cases of dengue hemorrhagic fever in the Americas.

Food-borne Illnesses

In the same way that international travel by people can lead to the exposure and transmission of infectious diseases, infectious agents also can be "imported" into the United States through our food. This issue is growing in importance because within the last decade – from 1997 to 2007 – food imports to the U.S. have nearly doubled, from $36 billion in 1997 to more than $70 billion in 2007 (Centers for Disease Control and Prevention). This increase is due partly due to consumer preferences, and partly due to the increased access to foreign foods because of trade agreements.

The globalization of food supplies raises questions about safety standards for food production and processing. Many other countries, especially developing ones (where much of the new food imports originate), do not possess the same health and sanitary safeguards of developed countries have. This raises the potential for the transmission of goods infected with pathogenic microorganisms.

Concerns about foreign foods are not confined to developing countries, of course. The outbreak of Bovine Spongiform Encephalopathy (BSE), or "mad cow disease," led to a mass slaughter of cattle in Britain and cost the British beef industry between $10 and $40 billion. Other EU countries declined to import cattle from Britain over a period of almost two years as a result of the BSE. (The damage was not limited to the economy either: criticism over the handling of the crisis helped contribute to the fall of the government of British Prime Minister John Major.)

Aside from concerns about foreign foods, the mass processing and distribution of food has itself provided new outlets for the transmission of harmful microbes. Massive outbreaks of salmonella and e. coli bacteria, for instance, have been linked to central
food processing centers, which could never have affected so many people without mass distribution capabilities.

The spring of 2008 witnessed a salmonellosis outbreak, linked to the consumption of certain types of red raw tomatoes and serrano peppers, as well as fresh cilantro (or certain products containing said vegetables). The New York Times reports that “in the months since the outbreak was first detected in April, the agency [CDC] has identified 1,017 people who were infected with the same strain, Salmonella Saintpaul.”

Of course, imports of food and the development of sophisticated food distribution networks have been a very positive thing for most consumers. Prior to increases in transportation capabilities and refrigeration technology, people living in cooler climates (such as the northern two-thirds of the United States) were not able to eat fresh fruits and vegetables in winter months. Consequently, at certain times of the year, more than 75 percent of the fresh produce that is sold in stores and restaurants within the United States originates overseas.

One hundred years ago, people living in northern climates considered an orange or an apple as a Christmas present to be an exotic and prized gift. Today, Americans expect to see groceries stores fully stocked with fresh fruits—many of which come from the Southern Hemisphere—at all times of the year.

Compounding the problems of increased mobility of people and food-borne illnesses is a nexus between these two concerns within the United States. Within the food service industry in the United States, a high percentage of food preparation tasks are carried out by immigrants from developing countries where intestinal infections are endemic, and the new jobs immigrants hold often provide low wages, and little or no health insurance or paid sick leave. This encourages them to continue working even while sick. While less than 0.5 percent of the general population in the United States harbor intestinal parasites, studies of employees of restaurants known to have been involved in outbreaks of food borne illness have found that as many as 18 percent of workers were carrying intestinal infections.

Urbanization

The percentage of the world's population that lives in urban settings has increased explosively in recent years. In 1950, less than 30 percent of the world’s population lived in urban areas. By the year 2003, that proportion had grown to 48 percent. The year 2008 witnessed a remarkable shift: for the first time, the majority of the world population now lives in an urban setting. The Population Reference Bureau (September 2007) predicts that by the year 2030, roughly 60 percent of the world's population will live in urban areas.

Because urban populations are characterized by much higher densities of people—meaning that more people are sharing the same spaces—diseases are much more easily transmitted.
And almost all of the future growth of the world's urban centers will occur in the developing world, where health response systems are weakest. In the upcoming 30-year period when total world population is predicted to increase from 6.0 to 8.1 billion people, almost all of this growth will occur within cities; the urban populations of developing countries are expected to grow from 1.9 to 3.9 billion people, while the number of urban dwellers in developed countries will remain almost unchanged.

This population growth is therefore of particular concern because potential public health problems tend to be exacerbated by poverty in developing countries. Many of these expanding cities are characterized by squalid conditions and sprawling shantytowns. Between 1990 and 2002, 1.1 billion people gained access to improved water resources and, during this period, global sanitation coverage increased from 49 percent in 1990 to 58 percent in 2002. This data though varies from region to region and progress has been made in Asia, but as much in sub-Saharan Africa.

In 2008, nearly two billion people, the equivalent of 30 percent of the world’s population, still lack access to clean drinking water. These high densities of people and these unsanitary conditions make for almost perfect breeding grounds for pathogens.

Of course, globalization cannot be said to have caused the move away from subsistence agriculture toward urbanization and industrialization. However, it may be working to accelerate this process in many countries, as international trade and investment create more formal sector jobs in developing countries. The creation of more jobs tends to lead to rising wages levels and inducing more people to move to cities in search of work.

**Climate change**

Another potential threat that could have a significant impact on global human health comes from the possibility of climate change. The predicted rise of average global temperatures due to human behavior (from the burning of fossil fuels, use of other chemicals, and the cutting down of forests) has been increasingly accepted by international scientists.

A report by the Intergovernmental Panel on Climate Change (IPCC) found that:

Projected climate change will be accompanied by an increase in heat waves, often exacerbated by increased humidity and urban air pollution, which would cause an increase in heat-related deaths and illness episodes. The evidence indicates that the impact would be greatest in urban populations, affecting particularly the elderly, sick and those without access to air-conditioning.

Many climate models indicate that the world is likely to become significantly wetter as a result of the warming process—meaning that rainfall is likely to increase in many areas.

This rise in temperatures and moisture would significantly expand the natural habitats of mosquitoes, which carry malaria and other diseases. A report by the National Institute of Public Health and Environmental Protection in the Netherlands calculated that the predicted global mean temperature rise of three degrees Celsius by 2100 would double the potential for malaria epidemics in tropical regions, and increase the potential in temperate zones by more than 10 times (cited in McGinn).

Similarly, the southwestern United States has been affected by the emergence of the previously unknown Hanta virus. Mice spread this microbe, which is extremely deadly.
The recent appearance of the disease in humans has been linked to an exponential increase in the population of mice in the region brought about by significantly increased rainfalls. The heavier rains have been attributed to the El Nino effect.

Although some scientists question whether the apparently increased severity of the El Nino effect is a result of global warming, the phenomenon is nonetheless believed to provide an accurate model for how rainfall would increase due to overall global warming.

The report by the IPCC also predicts that the increase in global mean temperatures will also lead to increased flooding in coastal areas, which "will increase the risk of drowning, diarrheal and respiratory diseases, and in developing countries, hunger and malnutrition."

**Microbial Drug Resistance**

When a person becomes ill due to the presence of a bacterial or parasitic infection, doctors sometimes prescribe antibiotics to help fight off these microbes (viruses are another kind of microbe, but they are not affected by antibiotics).

However, when anti-microbial substances are used with great frequency, there is an increasing chance that some of the microbes will, through the natural process of genetic mutation, develop characteristics that make them less susceptible or even immune to treatment. The mutation may have randomly conferred this protection on one microbe out of millions or billions. This microbe may then go on to multiply and generate billions of its own offspring, which possess the same genetic properties that made the earlier variant immune to the antibiotic. When this happens, the new strain is considered to be "resistant" to treatment.

Physicians have been aware of this effect for some time. In the 1940s, doctors discovered that penicillin was extremely effective in treating infections caused by the Staphylococcus (or "staph") bacterium. However, after years of penicillin use, resistant strains of the bug began to emerge. These strains multiplied, replacing the weaker versions that were susceptible to penicillin, and they became much more common.

By the 1950s, virtually all of the cases of staph that appeared were of the resistant variety, and penicillin was no longer effective as a treatment. Doctors then had to develop stronger drugs such as erythromycin and methicillin. As the years went by, staph bacteria became resistant to those drugs as well, making the new drugs ineffective. Although some very powerful drugs remain to fight staph, these too are losing their effectiveness, and scientists are struggling to develop new treatments that will be effective.

For this reason, doctors are now becoming aware of a serious global threat from "resistant" bacteria. Some have suggested that so many strains are developing resistance that we may eventually enter a "post-antibiotic" era, where there are few treatment options for these types of infections.

One of the biggest problems contributing to microbial resistance is the abuse of antibiotics. When antibiotics are used improperly or in widespread circumstances, this practice may actually encourage the development of resistant strains. Some doctors mistakenly prescribe antibiotics to treat people who are suffering from viral infections. In
addition, many doctors have criticized the mass use of antibiotics as a standard supplement to animal feeds to help prevent infections in livestock.

One of the greatest concerns in international public health has been the emergence of strains of serious diseases such as tuberculosis (TB) that are drug resistant. In many cases, the new bacteria are multi-drug resistant, which are extremely difficult and often very expensive to treat.

Resistant TB has become an increasingly difficult problem in Russia and Eastern Europe. Within Russia’s crowded and squalid prisons, TB has become endemic. As much as 10 percent of Russia’s prison population is estimated to have active TB, and 20 percent of those cases appear to be multi-drug resistant. Public health officials are therefore watching the region of the world with great alarm, waiting for these super-bacteria to spread to the rest of the world.

A mini-epidemic of MDR-TB in New York City in 1992 led to a massive and rapid intervention by local and federal public health officials. Health authorities spent $1 billion containing the outbreak, which eventually caused the deaths of 500 people (most of whom had weakened immune systems due to HIV).

**Breakdowns in Public Health Systems**

Standing out against this backdrop of concerns are the world’s public health systems. Very often, small changes in the level of preventative care or treatment that is provided by these systems can combine with other disruptions in the environment or social conditions to create the conditions for the explosion of certain diseases.

The growth of shantytowns, squalid living conditions, and inadequate health care services are all conducive to epidemics. Even more dramatically, the disruptions caused by wars, civil disturbances, or economic collapses can lead to the erosion of the public health system.

The most deadly epidemic of the 20th century was the influenza outbreak of 1918, which was fueled by effects relating to World War I. The war led to the concentration of hundreds of thousands of troops in trenches, barracks, and hospitals, many of whom suffered malnutrition and other diseases due to the privations of the fighting. Taken together, these factors formed a combustible mixture that fueled a worldwide epidemic that killed 20 million people.

Health conditions in Russia today are among the greatest concerns of international epidemiologists, where unstable political conditions, severe pollution, large migrations of people and serious economic disruption have accompanied a collapse of the public health system, leading to many new serious epidemics.

Malcolm Gladwell in *The Tipping Point* details an incident within the United States that illustrates well how small changes in the public health system can lead to the appearance of an epidemic:

In Baltimore in the mid-1990s, several small and unrelated events combined to create a serious epidemic of syphilis. Within the inner city of Baltimore, the city had undertaken an urban renovation project and began dynamiting old public housing buildings. This led
to the physical relocation of hundreds of families. Other neighboring row houses began
to empty out as well, creating a small diaspora of the local population. At the same time,
the city, due to budget cutbacks, eliminated seven of the 17 medical personnel who
serviced public clinics in these neighborhoods. As a result of the medical cutbacks, the
number of people being treated for syphilis per year fell from 36,000 to 21,000.

Until that time, the number of cases of syphilis per year had been relatively constant,
and largely confined to a specific and relatively insular population within these small
sections of the city. However, this collision of events—the cutbacks in the clinics and the
forced and voluntary relocations—served to disperse the infected population across the
city at the same time that access to treatment was curtailed.

The result? An unexpected epidemic of syphilis across the city. The number of cases of
children born with syphilis increased by 500 percent over the course of a year, all
because of a few small changes in how people lived.

For Malcom Gladwell's *The Tipping Point* please [click here](#).

One of the most serious criticisms of globalization pertaining to public health is the
allegation that international financial institutions have, in some instances, put
economic priorities ahead of public health concerns. A recent report by the WHO
warned, "Economic globalization has also increased the need for governmental budget
austerity, and this has on some occasions meant serious cuts in public health spending,
which is not cost effective in the long run."

In many cases, the disputes are over short-term versus long-term economic
consequences. For instance, a nation's inability to control inflation – which is often
caused by too much government spending – can have serious consequences for its
long-term growth potential. And the best way to ensure a nation's long-term health is to
promote economic prosperity, raising income levels and living standards.

The question often boils down to the specific areas in which the governments in question
choose to slash their budgets—for instance, on preventative care versus treatment. The
matter is sure to remain one of the most sensitive controversies about health and
globalization.

**Global Disease or Globalization Disease?**

Students of globalization often quickly discover that different authors use the term
"globalization" to describe many different phenomena. In some cases, the definition is
applied so widely that that it can mean almost any international event or relationship,
and pertain to all kinds of economic, social, political, and cultural changes. Of course,
when a term is defined so broadly that it encompasses everything, it tends to end up
meaning nothing, and becomes useless as a descriptive term.

For this reason, Globalization101.org has described globalization rather narrowly, as
"the acceleration and intensification of economic interaction between the people,
companies, and governments of different nations," recognizing that this is a process
driven by both technology and government policy.
The previous section contained a list of ways that international public health is affected by globalization. Keeping in mind this precise definition of globalization, one may ask whether the concerns stated earlier are in fact globalization issues, or merely health issues that have global significance. Looking at that list again, we can see that some of them fall into the first category, some into the second, and others somewhere in between:

- Increased international travel
- Increased transit of goods
- Food-borne illnesses
- Urbanization
- Climate change
- Localized environmental concerns
- Increased drug resistance by microbes
- Breakdowns in public health systems

Think about each of these concerns separately. To what extent are these issues the results of policy decisions that pertain to globalization? How many are due to increased trade and investment? Which of them have been driven by technology? Which of these can be thought of as causes of globalization?

For example, the items we have arrayed at the top of this list, such as increased international travel, the transit of goods, and food-borne illnesses, are clearly items that are directly related to globalization. But as you move down this list, you can see that the correlation between these issues and the increasing economic linkages that we refer to as globalization grows weaker.

For example, the breakdown of the Russian public health system is more related to that country’s difficult transition from a controlled socialist economy to a democratic market one. And the increasing drug resistance of diseases is due to the global use (and abuse) of life-saving anti-microbial medicines.

To be sure, a link to globalization can be found within each of these issues. But it would be difficult to argue that a reversal of globalization would lead to an improvement of these problems. For instance, let us imagine that the world trading system suffered a serious breakdown; that trade agreements were scrapped and nations began to raise barriers to international trade and investment, even cutting cross-border communications and travel.

While the set of problems relating to the movement of people and goods would certainly be much improved, these changes would do little or nothing to counter the trend toward urbanization or microbial resistance. In many cases, such changes might actually exacerbate these problems.

**The Global Public Health System**

Many international public health professionals believe that the response to these global health concerns must be a stronger global public health system. They argue that we must build more effective networks that can respond to outbreaks of disease,
disseminate knowledge, improve general living standards, and support research and treatment methods.

In particular, international public health officials have identified the need for action on several fronts to respond to global health concerns:

**Surveillance:** This refers to the development of systems to detect, monitor, and track the appearance of new diseases and the spread of existing ones. Proper surveillance requires spending on laboratories to help diagnose illnesses, and communications equipment and networks to ensure that information is being both distributed and analyzed.

International public health officials speak of the need to create a comprehensive global surveillance system, connecting doctors and research facilities around the world, so that they might better be able to identify outbreaks of disease. This would enable them to begin vaccinations or other preventative measures to stop epidemics in the early stages.

**Immunization:** The cost savings of immunization programs can be remarkable. Every dollar spent preventing a disease often returns itself many times over in the savings on treatment and lost economic productivity. For example, health economists estimate that every dollar spent on prevention for measles, mumps, and rubella saves $21 in treatment costs. For diphtheria and tetanus, the savings is $29.

Integrated public health systems that could efficiently provide immunization coverage to the entire world would be an investment with enormous returns, and even succeed in eradicating some diseases entirely.

**Research:** Increased spending on ways to treat and identify diseases will be essential to meeting the international public health challenges of the future. As diseases inevitably develop resistance to medicines, new treatments must constantly be developed.

Unfortunately, diseases that are endemic to developing countries currently receive the least funding. Of the $56 billion currently spent on global health research, less than 10 percent of that funding goes to the illnesses that comprise 90 percent of the world’s total disease burden (Kassalow). International public health expenditure must therefore help fill in this gap.

**Improved sanitation and living conditions:** Basic expenditures by developing countries on public health infrastructure—which can include improved nutrition and food safety testing, increased access to safe water, and proper sewage disposal—can yield enormous savings.

**Price of drugs:** As stated in the above sections, there is often a severe disparity between needs and resources on international public health issues. This has been very much the case with the availability of drugs used to treat infectious disease.

Part of the problem is that pharmaceutical manufacturers do not find it profitable to invest research money on diseases that affect developing countries. This is because few people in these countries can afford to pay the prices for the medications that would allow the companies to recoup their research costs. And when treatment drugs have been invented, there is serious controversy over the prices that developing countries
must pay for those drugs, while still preserving the profit incentives of the researcher companies. In 2003, the World Trade Organization adopted an intellectual property agreement that allows developing countries to produce some patented drugs at cheaper prices, provided they are sold only in other developing countries, and affirms that trade agreements should not interfere with a government’s efforts to address public health challenges.

Beyond the price of the drugs, other health infrastructure requirements prevent citizens of poor countries from access to life-saving medications. In addition to having access to drugs that are cheap, a sick person must also have access to local medical professionals and laboratories that can properly diagnose their ailment, transportation systems that can deliver the drugs to their area (some of which may require constant refrigeration – a considerable additional expense), and trained health officials who can administer and monitor the use of the drugs.

Conclusion

The challenge of international public health in the era of globalization is therefore one of improving networks and methods of identifying, tracking, and responding to the emergence of new diseases. Building an effective, integrated web of global public health services to serve these needs is, of course, itself a kind of globalization.

Technology also drives much of the globalization phenomena. Technological developments, from increased travel to better communication abilities and the development of new crops that can improve nutrition, are also partially responsible for driving changes in global health indicators. These forces not only present new risks for the transmission of disease, but they also contain the possibility for improving millions of lives.

The question for the future will be whether these challenges are met, raising all the world’s people to the health standards of those in wealthy countries,—or whether infectious disease will prove too much for these systems, and lead to increasingly severe pandemics that may affect rich and poor countries alike.