

ESSAY

LAW AS A STRUCTURAL FACTOR IN THE SPREAD OF COMMUNICABLE DISEASE

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I. INTRODUCTION

For most of the past century, the prevalence of communicable disease was in decline throughout the developed world.¹ Smallpox, the most notorious of epidemic diseases, was eradicated from the face of the planet.² Although the causes of the decline were many and complicated,³ the decline was popularly attributed to the success of medicine and wonder drugs like penicillin. Epidemiologists heralded an “epidemic transition” from communicable diseases to chronic conditions and

1. See Gregory L. Armstrong et al., *Trends in Infectious Disease Mortality in the United States During the 20th Century*, 281 JAMA 61, 61 (1999).

2. See COMMITTEE ON EMERGING MICROBIAL THREATS TO HEALTH, INSTITUTE OF MEDICINE, *EMERGING INFECTIONS: MICROBIAL THREATS TO HEALTH IN THE UNITED STATES* 25 (Joshua Lederberg et al. eds., National Academy of Sciences, 1992) [hereinafter IOM REPORT].

3. See generally THOMAS MCKEOWN, *THE ORIGINS OF HUMAN DISEASE* (1991); SAMUEL H. PRESTON & MICHAEL R. HAINES, *THE FATAL YEARS: CHILD MORTALITY IN LATE NINETEENTH CENTURY AMERICA* (1991); CENTERS FOR DISEASE CONTROL AND PREVENTION, *Control of Infectious Diseases*, 48 MORBIDITY & MORTALITY WKLY. REP. 621 (1999); John B. McKinlay & Sonja M. McKinlay, *The Questionable Contribution of Medical Measures to the Decline of Mortality in the United States in the Twentieth Century*, 55 MILBANK MEMORIAL FUND Q. 405 (1977).

malignancies,⁴ and the attention of nearly everyone interested in health, from researchers to the legislators holding the purse strings, turned to the task of dealing with cancer, cardiovascular disease, and other “modern” killers.

It is not quite correct to say that infectious diseases are back. Yes, mortality due to infectious diseases rose fifty-eight percent in the United States between 1980 and 1992.⁵ Yes, since 1980, this country alone has seen a communicable disease, HIV, become a major source of premature mortality.⁶ Yes, several different forms of hepatitis pose the potential for tens or even hundreds of thousands of deaths in the next decades.⁷ Yes, outbreaks of Legionnaire’s Disease, salmonella, Hanta virus, tuberculosis, and encephalitis have dramatically reminded us of the dangers of communicable diseases.⁸ Yes, infectious disease is exacting a significant toll in treasure (see Table 1). But we cannot say that infectious diseases are back for the simple reason that they never left. Only thirty years separate the effective control of polio in the mid-fifties and the emergence of HIV in the United States, and even within that period of relative quiet, communicable diseases were endemic in parts of the society whose ills were not a matter of concern to most Americans. Throughout the last few decades, tuberculosis and a range of sexually transmitted diseases (STDs) were major problems in many poor communities.⁹ On a broader view, the relative freedom of the developed world from communicable disease was not part of life in developing countries, where communicable

4. See Armstrong et al., *supra* note 1, at 61 (explaining that “the ‘theory of epidemiologic transition’ attributes these trends to the transition from an ‘age of pestilence and famine’ . . . to the current ‘age of degenerative and man-made diseases’ in which mortality from chronic diseases predominates”).

5. See *id.*

6. See CENTERS FOR DISEASE CONTROL AND PREVENTION, *Summary of Notifiable Diseases, United States, 1997*, 46 MORBIDITY & MORTALITY WKLY. REP. 18 [hereinafter *CDC Summary*].

7. Miriam J. Alter et al., *The Prevalence of Hepatitis C Virus Infection in the United States, 1988 Through 1994*, 341 NEW ENG. J. MED. 556, 556 (1999) (“In the United States, about 2.7 million persons are chronically infected with HCV.”).

8. See, e.g., *CDC Summary, supra* note 6, at vii-xiii.

9. See Thomas R. Frieden et al., *Tuberculosis in New York City—Turning the Tide*, 333 NEW ENG. J. MED. 229, 229 (1995) (reporting that “[b]y 1992, the situation in New York looked bleak. The number of cases of tuberculosis had nearly tripled in 15 years.”); Lawrence O. Gostin, *The Resurgent Tuberculosis Epidemic in the Era of AIDS: Reflections on Public Health, Law, and Society*, 54 MD. L. REV. 1, 10, 12-13 (1995) (commenting that tuberculosis continues to affect poor communities at a greater rate than other communities); see also Sevgi O. Aral & King K. Holmes, *Sexually Transmitted Diseases in the AIDS Era*, 264 SCI. AM. 62, 62 (1991) (reporting that STDs have “been increasing at epidemic rates among urban minority populations in the U.S.”).

diseases—from malaria and cholera to tuberculosis—have continued to take an enormous and steady toll.¹⁰

Table 1: Annual costs and/or medical charges associated with selected infectious diseases¹¹

Disease	Annual cost	Type of cost
AIDS	\$5.8 billion	Direct medical charges (1993 dollars)
Tuberculosis	\$703 million	Direct medical charges (1991 dollars)
Hospital-acquired infections	\$4.5 billion	Hospital charges (1992 dollars)
Foodborne bacteria (six common types)	\$2.9-\$6.7 billion	Direct and indirect costs (1993 dollars)
Human papillomavirus	\$1.23 billion	Direct medical charges (1991 dollars)
Neonatal group B streptococcal infections	\$294 million	Direct medical charges (1993 dollars)
Bacterial vaginosis	\$1 billion	Direct medical charges (1993 dollars)

10. See, e.g., *The Chronicle Interview; Interview with Gro Harlem Brundtland, Director General of the World Health Organization*, UN CHRON., Mar. 22, 1999, No. 1, Vol. 36, at 12, available in LEXIS, News Library, ASAPII File. Davidson R. Gwatkin & Patrick Heuveline, in *Improving the Health of the World's Poor: Communicable Diseases Among Young People Remain Central*, 315 BRIT. MED. J. 497 (1997), reported:

Non-communicable diseases were responsible for most (56%) deaths in the world in 1990. But a closer look at the figures shows that these deaths were unevenly distributed across social class. For example, noncommunicable diseases caused a notably smaller percentage of deaths (34%) among the poorest 20% of the world's population and a much higher percentage (85%) among the richest 20%. The situation for communicable, maternal, and perinatal diseases was the reverse: they caused 33% of deaths overall but 56% among the poorest compared with only 8% among the richest.

Id. at 497.

11. Adapted from CENTERS FOR DISEASE CONTROL AND PREVENTION, *Preventing Emerging Infectious Diseases: A Strategy for the 21st Century: Overview of the Updated CDC Plan*, 47 MORBIDITY & MORTALITY WKLY. REP. 2 & tbl. 1. (1998) [hereinafter *CDC Overview*].

In any event, citizens and policy makers are once again paying attention to infectious disease. From popular books¹² and expert reports¹³ alike come warnings that we must begin to act to cope with the protean threat of disease. In this Essay, I consider the challenge infectious disease poses to the United States. On one level, this is a classic challenge of disease control, implicating a well-tested set of public health tools¹⁴ and the associated legal rules.¹⁵ Drawing on the epidemiological literature addressing the causes of illness in the social and physical environment, however, I will suggest that infectious diseases are themselves symptomatic of deeper maladies. On this view, infectious disease is merely another mechanism by which social and material inequalities take a disproportionate toll on the relatively poor within countries and across the world. In Part IV, I will discuss the implications of this “structural analysis” of infectious disease for public health law and identify four questions for future research and action.

II. A BRIEF OVERVIEW OF THE DISEASE THREAT: STANDARD VERSION

Others have provided thorough descriptions of the disease threats we now face.¹⁶ Table 2 sets out some basic concepts, and for the convenience of the reader, I will briefly rehearse the main points of the story. The term of art in public health is “emerging infectious diseases,” which are defined as “diseases of infectious origin whose incidence in humans has increased within the past

12. See generally, e.g., LAURIE GARRETT, *THE COMING PLAGUE: NEWLY EMERGING DISEASES IN A WORLD OUT OF BALANCE* (1994); RICHARD PRESTON, *THE HOT ZONE* (1994).

13. See generally, e.g., IOM REPORT, *supra* note 2.

14. The Centers for Disease Control and Prevention’s current response plan, *Preventing Emerging Infectious Diseases: A Strategy for the 21st Century*, was published in 1998 and updated and expanded upon a 1994 scheme. See CDC *Overview*, *supra* note 11, at 1-2; CENTERS FOR DISEASE CONTROL AND PREVENTION, *Addressing Emerging Infectious Disease Threats: A Prevention Strategy for the United States—Executive Summary*, 43 *MORBIDITY & MORTALITY WKLY. REP.* 1-2 (1994) [hereinafter *CDC Prevention Strategy*] (finding that infectious diseases continue to be “the leading cause of death and disability-adjusted life years (DALYs) worldwide”). The current plan covers four broad areas: surveillance (organized efforts to identify and track disease), training and infrastructure, applied research, and prevention and control measures.

15. See generally Lawrence O. Gostin et al., *The Law and the Public’s Health: A Study of Infectious Disease Law in the United States*, 99 *COLUMB. L. REV.* 59, 79 (1999).

16. See, e.g., IOM REPORT, *supra* note 2, at 1; David P. Fidler, *Return of the Fourth Horseman: Emerging Infectious Diseases and International Law*, 81 *MINN. L. REV.* 771, 776-810 (1997).

two decades or threatens to increase in the near future.”¹⁷ This works well to highlight the immediate problem we face: people dying of things they hadn’t died of before, or at least for awhile. I prefer in this discussion, however, to describe the problem in terms of the “persistence” of infectious diseases, for reasons that should become clear in the course of the next section.

Table 2. Basic concepts in disease emergence¹⁸

- ◆ Emergence of infectious diseases is complex
- ◆ Infectious diseases are dynamic.
- ◆ Most new infections are not caused by genuinely new pathogens.
- ◆ Agents involved in new and reemergent infections cross taxonomic lines to include viruses, bacteria, fungi, protozoa, and helminths.
- ◆ The concept of the microbe as *the* cause of disease is inadequate and incomplete.
- ◆ Human activities are the most potent factors driving disease emergence.
- ◆ Social, economic, political, climatic, technologic, and environmental factors shape disease patterns and influence emergence.
- ◆ Understanding and responding to disease emergence require a global perspective, conceptually and geographically.
- ◆ The current global situation favors disease emergence.

Like two people who just are not good for each other, human beings and microbes are in *a relationship* that neither can escape, within a shared social and physical environment.¹⁹ There are times when the relationship is not too bad and times when it is dreadful, although deciding which time is which would naturally depend upon whether one happens to be the microbe or the *Homo sapiens*. The characteristics and behavior of the microbes, the people, and the environment all influence the process, whose health outcomes change as the inputs change. Change can be biological (as when a microbe mutates), or geographical (as when a microbe is carried to a new location or people move into a new area), or behavioral (as when there are

17. CDC *Prevention Strategy*, *supra* note 14, at 1.

18. Mary E. Wilson, *Travel and the Emergence of Infectious Diseases*, 1 EMERGING INFECTIOUS DISEASES 39, 39 (1995).

19. See Joshua Lederberg, *Emerging Infections: An Evolutionary Perspective*, 4 EMERGING INFECTIOUS DISEASES 366, 366 (1998).

changes in sexual behavior or food processing practices), or environmental (as when climate change creates new contacts between people and bugs or a social or political system changes drastically). Understanding why infectious diseases persist is a precondition to effectively, and justly, reducing their toll.

A. *Changes in the Biology of Disease*

"Microbes have enormous potential for creating genetic diversity."²⁰ They take vast fluctuations in their population in stride and come back with renewed and refined virulence. They are marvels of adaptation to circumstances. This microbial adaptability manifests itself in the human-pathogen relationship in several important ways.

One of the most attention-getting forms of adaptation in recent years has been the development of microbe strains that are resistant or impervious to drugs that had previously been able to kill them. Multi-drug resistant tuberculosis is a major health threat internationally and has been epidemic in areas of the United States.²¹ The emergence of strains of streptococcus and staphylococcus resistant to nearly all known antibiotics is likely to have an even more dramatic effect in the United States.²² Plague itself, the eponymous disease of dread, is showing signs of antimicrobial resistance.²³ Drug resistance is a virtually inevitable consequence of the adaptability of microbes and the limits of drugs: "No drug is universally effective against all bacteria, and as a drug is used, resistant organisms emerge from the initially susceptible population."²⁴ Although inevitable, the pace of resistance can be kept slow, and our failure to minimize the development of resistance has a variety of causes, from an individual's failure to complete treatment to the point of extermination of his infection, through the unnecessary use of drugs (as in the common practice of prescribing antibiotics for viral infections), to the use of antibiotics in animal feed. It is a striking fact that about *half* of the antibiotics produced in the United States are fed to animals being raised for human

20. *Id.*

21. See, e.g., Frieden et al., *supra* note 9, at 229; Gostin, *supra* note 9, at 10.

22. See, e.g., CENTERS FOR DISEASE CONTROL AND PREVENTION, *Staphylococcus Aureus with Reduced Susceptibility to Vancomycin—United States, 1997*, 46 MORBIDITY & MORTALITY WKLY. REP. 765 (1997); CDC *Overview*, *supra* note 11, at 10 & fig. 1. See generally IOM REPORT, *supra* note 2, at 93-94.

23. See David T. Dennis & James M. Hughes, *Multidrug Resistance in Plague*, 337 NEW ENG. J. MED. 702, 702 (1997) (reporting on a strain of the plague that "was resistant to all first-line antibiotics as well as to the principal alternative drugs").

24. IOM REPORT, *supra* note 2, at 92-93.

consumption.²⁵ As resistance increases, once curable infections lead to longer illnesses, complications, and in some cases death.

A similar phenomenon, less noted by the public, has unfolded with insecticides and insect vectors of disease. Many diseases, such as malaria, dengue-dengue hemorrhagic fever, yellow fever, and Venezuelan equine encephalitis, are spread by insects. "Resistance to insecticides has appeared in the major insect vectors from every genus. As of 1992, the list of insecticide-resistant vector species included 56 anopheline and 39 culicine mosquitoes, body lice, bed bugs, triatomids, eight species of fleas, and nine species of ticks."²⁶

Viruses also "emerge" by jumping from one species to another. This is the pattern of influenza viruses, such as the chicken-hosted avian influenza that struck Hong Kong with disturbing virulence in 1997.²⁷ Other recent examples include HIV, Ebola fever, Hanta virus, and dengue-dengue hemorrhagic fever.²⁸

B. *People and Microbes in Motion*

Travel, trade, and the migration of human populations have historically spread disease. The impact of European diseases like smallpox upon the original inhabitants of the Americas was catastrophic and has been well documented.²⁹ Pandemics of cholera have moved with trade across the globe for the past 200 years.³⁰ National boundaries have never been more porous than they are now: every day, more than one million people cross a

25. *See id.* at 64.

26. William G. Brogdon & Janet C. McCallister, *Insecticide Resistance and Vector Control*, 4 EMERGING INFECTIOUS DISEASES 605, 605 (1998).

27. *See* CENTERS FOR DISEASE CONTROL AND PREVENTION, *Isolation of Avian Influenza A(H5N1) Viruses from Humans—Hong Kong, May-December 1997*, 46 MORBIDITY & MORTALITY WKLY. REP. 1204, 1205-06 (1997) (discussing the ongoing investigation into the origin of this strain of influenza in Hong Kong); Rene Snacken et al., *The Next Influenza Pandemic: Lessons from Hong Kong, 1997*, 5 EMERGING INFECTIOUS DISEASES 195, 196 tbl. (1999) (detailing the potential link between a virus found in chickens and the one that infected humans in Hong Kong).

28. *See* Nathan D. Wolfe et al., *Wild Primate Populations in Emerging Infectious Disease Research: The Missing Link?*, 4 EMERGING INFECTIOUS DISEASES 149, 149-50 (1998) (reviewing links between viral infections in humans and those found in other primates and hypothesizing on various methods of transmission of these viruses between species).

29. *See* Wilson, *supra* note 18, at 39-40.

30. *See, e.g.*, CHARLES E. ROSENBERG, *THE CHOLERA YEARS: THE UNITED STATES IN 1832, 1849 AND 1866* (1987) (recounting three waves of cholera in the 19th century); Wilson, *supra* note 18, at 42-43 (describing current modes of travel and their impact on the spread of various infectious diseases, including cholera).

border from one nation into another.³¹ The diseases they bring with them range from influenza³² to HIV, which has been carried worldwide from its probable place of origin in Africa.³³

Moreover, as Mary Wilson points out, human beings do not only carry microbes.³⁴ As they move, they may carry insect vectors, immunities and vulnerabilities, genetic makeup, and cultural factors (for example, dietary preferences, behavioral norms, and technology). All of these factors, as discussed below, have a profound effect on health and on the prevalence of disease. Consider the problem of hitch-hiking insects, such as *Aedes albopictus*, a hardy strain of mosquito that came to North America in used tires from Asia.³⁵ Wilson has described the problems it can cause:

[I]t is an aggressive biter, survives in both forest and suburban habitats, and appears to be a competent vector for several human pathogens [including] dengue fever . . . [,] La Crosse, [and] yellow fever In Florida, 14 strains of eastern equine encephalitis virus have been isolated from *A. albopictus*. The mosquito is now established in at least 21 of the contiguous states in United States and in Hawaii.³⁶

The threat of insect-carried disease was dramatically illustrated to New Yorkers during August and September, 1999, when there was an outbreak of West Nile virus infection, which had never before been reported in this hemisphere.³⁷

Trade naturally entails not only the movement of people, but also of products that may carry pathogens. The globalization of the food industry is already having enormous health (and regulatory) effects.³⁸ As Americans consume fresh produce from

31. See Derek Yach & Douglas Bettcher, *The Globalization of Public Health, I: Threats and Opportunities*, 88 AM. J. PUB. HEALTH 735, 737 tbl. 1 (1998).

32. See generally Snacken et al., *supra* note 27, at 195-96.

33. See generally THE GLOBAL AIDS POLICY COALITION, AIDS IN THE WORLD 11-22 (Jonathan M. Mann et al. eds., 1992).

34. See Wilson, *supra* note 18, at 41-42 & tbl. 2.

35. See *id.*

36. See *id.* at 43.

37. *Id.* (citations omitted).

38. See D. Asnis et al., *Outbreak of West Nile-Like Viral Encephalitis—New York, 1999*, 48 MORBIDITY & MORTALITY WKLY. REP. 845, 845-49 (1999). The outbreak was so extraordinary that some experts raised the possibility that the virus had been exported to the United States in a deliberate act of bio-terrorism. See Richard Preston, *West Nile Mystery*, NEW YORKER, Oct. 18, 1999, available in 1999 WL 15458431.

39. See generally DAVID P. FIDLER, INTERNATIONAL LAW AND INFECTIOUS DISEASES 126-68 (1999) (discussing several actions taken by the World Trade Organization to ensure the safety of food marketed globally).

South and Central America, for example, they can be exposed to enteric bacteria that they once would have met only on exotic vacations.³⁹

C. Behavioral Influences

Human behavior of all kinds can be understood as a crucial determinant of disease exposure.⁴⁰ Individual and group behavior has an enormous impact on the spread of sexually transmitted diseases,⁴¹ including HIV.⁴² Organized economic activity also has dramatic health effects. Overuse of antimicrobials in livestock and poultry production can lead to the rapid development of resistant strains of foodborne pathogens like *Campylobacter jejuni*.⁴³ Bovine spongiform encephalitis (Mad Cow Disease) seems to have entered the human population through the consumption of beef from cattle infected through the consumption of ruminant-derived meat and bone meal in feed.⁴⁴ Agribusiness, in the tradition of using everything in the pig but the squeal, had taken to grinding up all remnants from butchering processes and feeding the residue back to cattle. This practice provided a good source of protein for the cattle, but was also apparently an excellent way to spread a suspected new class of pathogen, called prions.⁴⁵ The result appears to have been a human epidemic of Creutzfeldt-Jakob disease in Britain.⁴⁶

39. See IOM REPORT, *supra* note 2, at 68.

40. See J. Michael McGinnis & William H. Foege, *Actual Causes of Death in the United States*, 270 JAMA 2207, 2209 (1993) (attributing a substantial number of deaths in the United States to behavioral factors such as tobacco use, drug use, alcohol use, and sexual behavior).

41. See Aral & Holmes, *supra* note 9, at 69.

42. See Gary Marks et al., *Reducing Sexual Transmission of HIV from Those Who Know They Are Infected: The Need for Personal and Collective Responsibility*, 13 AIDS 297, 297-304 (1999).

43. See Sean F. Altekruse et al., *Campylobacter jejuni—An Emerging Foodborne Pathogen*, 5 EMERGING INFECTIOUS DISEASES 28, 29 (1999) (explaining how quickly *C. jejuni* became resistant to fluoroquinolone once that antimicrobial was approved for use in poultry).

44. See Sir John Pattison, *The Emergence of Bovine Spongiform Encephalopathy and Related Diseases*, 4 EMERGING INFECTIOUS DISEASES 390, 390-95 (1998) (chronicling the history of Bovine Spongiform Encephalopathy in the United Kingdom and the related new strain of Creutzfeldt-Jakob disease (CJD)).

45. See Diana Walford & Norman Noah, *Emerging Infectious Diseases—United Kingdom*, 5 EMERGING INFECTIOUS DISEASES 189, 190 (1999).

46. See Pattison, *supra* note 44, at 390-91; Walford & Noah, *supra* note 45, at 190.

D. The Environment

Changes in the social and physical environment can also affect the relationship between pathogens and humans. Vector-borne diseases often show the influence of environmental changes on disease patterns. Arena viruses, which cause the South American hemorrhagic fevers, and the Hanta viruses, which cause hundreds of thousands of cases of hemorrhagic fever with renal syndrome each year in Europe and Asia and which caused a surprise outbreak of Hanta virus pulmonary syndrome (HPS) in the United States that had a fifty-percent mortality rate, are all borne by rodents.⁴⁷ The prevalence of the disease (spread by contact with rodent droppings) is closely related to the size and distribution of the rodent population and its feeding habits. When the rodent population outgrows its niche, or weather reduces food availability in the rodents' natural environment, rodents move near humans to feed and these diseases spread.⁴⁸ In the Northeast, reforestation, suburbanization, and the loss of natural predators increased both the deer population and human-deer contact, sparking an epidemic of Lyme Disease.⁴⁹

Social attitudes, practices, and institutions also constitute an important environment for the human-pathogen relationship. Complacency has been identified as a major underlying factor in the infectious disease control problem. People who are not aware of or worried about infectious diseases do not support prevention programs and do not appreciate the need for changes in their way of life.⁵⁰ Indeed, such apathy is a chronic, practical problem in public health generally.⁵¹

Serious breakdown in the social environment allows resurgence of controllable diseases. Diphtheria, a disease preventable by vaccination and well controlled in the Soviet Union since the late 1950s, erupted in a massive epidemic in the mid-1990s. By its peak in 1996, there had been 140,000 cases with 4,000 deaths.⁵² This reflected not just a waning of

47. See James N. Mills & James E. Childs, *Ecologic Studies of Rodent Reservoirs: Their Relevance for Human Health*, 4 EMERGING INFECTIOUS DISEASES 529, 529-30 (1998) (detailing the types and characteristics of several rodent-borne infectious diseases).

48. See *id.* at 532-34.

49. See IOM REPORT, *supra* note 2, at 27-28.

50. See Fidler, *supra* note 16, at 788-93; David P. Fidler et al., *Emerging and Reemerging Infectious Diseases: Challenges for International, National, and State Law*, 31 INT'L LAW. 773, 775 (1997).

51. See Gostin et al., *supra* note 15, at 89-91.

52. See Charles R. Vitek & Melinda Wharton, *Diphtheria in the Former Soviet*

vaccination rigor, but also poor living conditions, military movements (soldiers as carriers), and large population migrations after the fall of the Soviet Union.⁵³

It understates the role of the environment, however, to speak simply in terms of discrete social or ecological changes with dramatic immediate impacts on particular diseases. There is a growing recognition throughout the disciplines of public health that the “structural,” “environmental,” and “fundamental social” causes of disease have a pervasive impact on disease and must be more effectively identified and addressed if substantial improvements are going to be made in public health.⁵⁴ From specific social policies⁵⁵ to the overall distribution of socioeconomic status,⁵⁶ these conditions influence health by constituting the physical and social context in which individuals and communities behave, thus defining options and influencing choices.

Union: Reemergence of a Pandemic Disease, 4 EMERGING INFECTIOUS DISEASES 539, 539 (1998).

53. See *id.* at 542-45.

54. See generally Sevgi O. Aral et al., *Overview: Individual and Population Approaches to the Epidemiology and Prevention of Sexually Transmitted Diseases and Human Immunodeficiency Virus Infection*, 174 J. INFECTIOUS DISEASE S127 (Supp. 2 1996); Kim Blankenship et al., *Structural Initiatives in Public Health*, (forthcoming 2000); Robert G. Evans, *Introduction*, in WHY ARE SOME PEOPLE HEALTHY AND OTHERS NOT? 3-24 (Robert G. Evans et al. eds., 1994); Bruce Link & Mary Jo Phelan, *Social Conditions as Fundamental Causes of Disease*, 1995 (Extra Issue) J. HEALTH & SOC. BEHAV. 80 (1995); Bruce Link et al., *Social Epidemiology and the Fundamental Cause Concept: On the Structuring of Effective Cancer Screens by Socioeconomic Status*, 76 MILBANK Q. 375 (1998); Neil Pearce, *Traditional Epidemiology, Modern Epidemiology, and Public Health*, 86 AM. J. PUB. HEALTH 678 (1996); Geoffrey Rose, *Sick Individuals and Sick Populations*, 14 INT'L J. EPIDEMIOLOGY 32 (1985); Mervyn Susser & Ezra Susser, *Choosing a Future for Epidemiology: I. Eras and Paradigms*, 86 AM. J. PUB. HEALTH 668 (1996); see also generally MEREDETH TURSHEN, *THE POLITICS OF PUBLIC HEALTH* (1989).

55. See, e.g., Blankenship et al., *supra* note 54, at 1-24; Robert Heimer et al., *Structural Impediments to Operational Syringe-Exchange Programs*, 11 AIDS & PUB. POL'Y J. 169, 169 (1996) (detailing the influences of drug control policies on HIV prevention).

56. See Gregory Pappas et al., *The Increasing Disparity in Mortality Between Socioeconomic Groups in the United States, 1960 and 1986*, 329 NEW ENG. J. MED. 103, 103 (1993) (discussing “the inverse relationship between socioeconomic class and mortality . . . in the United States [and] how this relation may be changing”); see also Jonathon S. Feinstein, *The Relationship Between Socioeconomic Status and Health: A Review of the Literature*, 71 MILBANK Q. 279, 279-80 (1993) (reviewing and comparing numerous studies over the past 20 years of “the relationship between socioeconomic status and health”). The relationship between income inequality and health is the subject of an excellent collection of articles in 76 MILBANK Q. 309 (1998), including Michael Marmot et al., *Contribution of Psychosocial Factors to Socioeconomic Differences in Health*, 76 MILBANK Q. 403 (1998), and Link et al., *supra* note 54.

III. THE PERSISTENCE OF INFECTIOUS DISEASE FROM A STRUCTURAL PERSPECTIVE

Practical disease control efforts traditionally approached the problem of disease at multiple levels—from the microbe, through human behavior, to environmental factors.⁵⁷ Nevertheless, the response to infectious diseases in the past several decades has been dominated by the view that the most important factors in disease control are biomedical (indicating efforts focused on vaccination and cure) and behavioral (indicating efforts directed at changing individual behavioral risk factors).⁵⁸ In the health literature, scholars have mounted increasingly sophisticated challenges to this focus.⁵⁹ “Epidemiology,” in J.S. Koopman’s words, “is in transition from a science that identifies risk factors for disease to one that analyzes the systems that generate patterns of disease in populations.”⁶⁰ Bruce Link and Mary Jo Phelan have argued that “factors that involve a person’s relationships to other people,” should be seen as “fundamental causes” of disease.⁶¹ Defined “broadly to include money, knowledge, power, prestige and the kinds of interpersonal resources embodied in the concepts of social support and social

57. See Gostin et al., *supra* note 15, at 69-77 (discussing how prevailing views of disease causation influence public health work).

58. See Susser & Susser, *supra* note 54, at 669-71 & tbl. 1 (discussing the progression of theories of epidemiology of the past century).

59. Susser and Susser have argued that epidemiology is in a state of profound paradigm change and that “an exclusive focus on risk factors at the individual level within populations . . . will not serve. We need to be equally concerned with causal pathways at the societal level and with pathogenesis and causality at the molecular level.” Disease causation in societies is irregular and particular, rather than universal and constant. It varies within the overlapping and inter-reacting social subsystems that comprise the society as a whole. Susser and Susser offer a useful metaphor of “Chinese boxes[,]—a conjurer’s nest of boxes, each containing a succession of smaller ones. Thus, within localized structures, we envisage successive levels of organization, each of which encompasses the next and simpler level, all with intimate links between them.” Mervyn Susser & Ezra Susser, *Choosing a Future for Epidemiology: II. From Black Box to Chinese Boxes and Ecoepidemiology*, 86 AM. J. PUB. HEALTH 674, 674-75 (1996); see also Robert G. Evans and G.L. Stoddart, *Producing Health, Consuming Health Care*, in WHY ARE SOME PEOPLE HEALTHY AND OTHERS NOT?, *supra* note 54, at 27, 28-29 (identifying genetic endowment, physical environment, social environment, and individual behavioral and biological responses as key elements in the production of wellbeing); C. Hertzman et al., *Heterogeneities in Health Status and the Determinants of Population Health*, in WHY ARE SOME PEOPLE HEALTHY AND OTHERS NOT?, *supra* note 54, at 79-80 (referring to an emerging “generalized vulnerability” view of epidemiology distinct from the classical focus on specific diseases as causes of illness).

60. J.S. Koopman, *Emerging Objectives and Methods in Epidemiology*, 86 AM. J. PUB. HEALTH 630, 630 (1996).

61. Link & Phelan, *supra* note 54, at 81-83, 85-87.

network,⁶² these causes work through intermediate factors, such as drug use, and immediate ones, such as communicable disease, to influence multiple disease outcomes. The fact that risk factors, and diseases themselves, are actually *intermediate* factors in illness—pathways through which deeper social causes operate to have their effect—explains the durability of social factors in health outcomes. When one intermediate factor, such as poor sanitation, is eliminated, another, such as drug use, take its place.

These social theories of disease causation also account to some extent for the mechanism by which socioeconomic status and other social factors actually influence health.

In the context of a dynamic system with changes in diseases, risks, knowledge of risks, and treatments . . . [socioeconomic] resources . . . are transportable from one situation to another, and as health-related situations change, those who command the most resources are best able to avoid risks, diseases, and the consequences of disease.⁶³

As David Blane puts it, “[T]his is precisely what societies do: they *structure* the life experiences of their members so that advantages and disadvantages tend to cluster cross-sectionally and accumulate longitudinally.”⁶⁴

STDs offer a particularly clear example of the role of social factors in disease persistence. The pattern of these diseases closely reflects social mores and economic conditions.⁶⁵ Sevgi Aral and King Holmes, reviewing the continued problem of STD infections, saw a powerful link between social conditions and STD distribution:

Such social problems as lack of education, joblessness, homelessness, welfare dependency, family dissolution, drug abuse, homicide and other crimes concentrate more and more in inner-city neighborhoods.

STDs and many other health problems also follow this pattern. The incidence rates and morbidity for many STDs differ greatly among socioeconomic, demographic and behavioral subgroups. Within these subgroups, the risk factors that determine what causes individual cases

62. *Id.* at 87.

63. *Id.*

64. David Blane, *Editorial: Social Determinants of Health—Socioeconomic Status, Social Class, and Ethnicity*, 85 AM. J. PUB. HEALTH 903, 904 (1995).

65. See generally ALLAN M. BRANDT, *NO MAGIC BULLET: A SOCIAL HISTORY OF VENEREAL DISEASE IN THE UNITED STATES SINCE 1880* (1987).

of STDs may be far less important than the overriding social forces.⁶⁶

Although there are many differences in detail, theorists of structural disease factors point consistently to several key propositions:

- ◆ that health and disease are to a considerable extent functions of social structures and practices;
- ◆ that understanding disease causation requires an understanding of the *processes of interaction* among social, environmental, genetic, and microbial factors;
- ◆ that these processes can be understood to be occurring at many different but interrelated levels of social and physical space, from the individual biological interaction of human and pathogen, through family and community relations, to the most fundamental social and environmental structures at the national and international levels;
- ◆ that the effect of deep social determinants of health can be produced through many more or less fungible intermediate and immediate factors, so that eliminating particular behavioral or microbial threats may not reduce the effect of the deep social determinants;
- ◆ that individuals, though not devoid of agency, are shaped in their behavior by social norms and practices that define their options and form their preferences; and
- ◆ that addressing individual behavior and other risk factors without addressing the social forces that shape them will often have limited effect.

On some levels, structural factors are well recognized in the conventional accounts of emerging disease. The Institute of Medicine's report, for example, discusses at length the roles of changes in commerce, land use, economic development, technology, industrial practices, and the environment in the infectious disease problem.⁶⁷ An explicitly structural view, however, tends to differ in important ways from the conventional account, most importantly in its treatment of social factors as targets of intervention rather than exogenous givens.⁶⁸ The

66. Aral & Holmes, *supra* note 9, at 69.

67. See IOM REPORT, *supra* note 2, at 34-112.

68. See Blankenship et al., *supra* note 54, at 1.

ultimate logic of a structural approach entails *action* at the structural level; it entails, that is, what Kim Blankenship and her colleagues have defined as “structural initiatives in health.” These are “initiatives that promote public health by altering the context within which individuals engage in health behaviors or make health related decisions.”⁶⁹ Such initiatives

locate the source of public health problems in factors in the social, economic and political environments that shape and constrain health behaviors and health-related decision-making. . . . Structural initiatives may be promoted through a variety of strategies, such as policy implementation, broadly defined to include legislation, litigation, regulation, law enforcement, and the setting of administrative, organizational, and product standards; or through community advocacy or organizing.⁷⁰

Few “factors in the social, economic and political environments” are unrelated to law, and it is inevitable that law would play some role in any effort to change how society operates. A structural view therefore contemplates an important role for law in public health work.

IV. LAW AS A STRUCTURAL FACTOR IN INFECTIOUS DISEASE

Legal structures, and particularly those affecting the enjoyment of human rights, have been identified as important and malleable factors in health. “Legal structures” include laws as well as the institutions and social practices tied to the creation, implementation, and interpretation of laws. The term therefore embraces everything from police enforcement practices and bureaucratic rulemaking to decisions of the Supreme Court and debates in Congress and includes not only the positive law of states (such as the U.S. Constitution and individual state embodiments), but also principles of human rights or public order the moral validity and rhetorical force of which do not depend upon their being codified (such as, for example, a perceived right to health care).

Several commentators have discussed the immediate roles of law in infectious diseases. Some health risks (for example, poor access to sterile injection equipment)⁷¹ have been directly attributed to law, and law has been deployed to change

69. *Id.*

70. *Id.*

71. See Ricky N. Bluthenthal et al., *Drug Paraphernalia Law and Injection-Related Infectious Disease Risk Among Drug Injectors*, 29 J. DRUG ISSUES 1, 20 (1999); Heimer et al., *supra* note 55, at 171.

unhealthy norms (smoking, for instance)⁷² or behaviors (such as driving while drunk).⁷³ David Fidler has written with great insight about international law's role in disease control,⁷⁴ whereas Lawrence Gostin, Zita Lazzarini, and I have evaluated domestic infectious disease control law.⁷⁵ These studies generally point to the law's possessive role as a source of disease control authority for government and its countervailing role as a source of protection for individuals and states against excessive and unnecessary regulations.⁷⁶ The direct role of the state in regulating individual and corporate behavior to prevent disease transmission is undeniably important and has properly received considerable attention in both expert reports and agency planning concerning the infectious disease problem.⁷⁷ In this Essay, however, I want to explore several other functions of law, the importance of which is highlighted by a structural analysis.

A. *Four Roles of Law*

1. *Law Governs and Protects the Possession and Transfer of Wealth and Goods.* It is a truism that law protects the haves against the have-nots, certainly within capitalist societies if not universally.⁷⁸ If disease reflects the patterns of the production and distribution of wealth, then naturally the rules that channel human activity into those patterns help structure health and disease. Taxation, international trade rules, and property law all have an influence on how wealth is created and its fruits enjoyed,

72. See Robert A. Kagan & Jerome A. Skolnick, *Banning Smoking: Compliance Without Enforcement*, in *SMOKING POLICY: LAW, POLITICS, AND CULTURE* 69, 69 (Robert L. Rabin & Steven D. Sugarman eds., 1993).

73. See generally Gostin et al., *supra* note 15, at 80; D.L. McArthur & J.F. Kraus, *The Specific Deterrence of Administrative Per Se Laws in Reducing Drunk Driving Recidivism*, 16 *AM. J. PREV. MED.* 68 (Supp. I 1999).

74. See generally FIDLER, *supra* note 38.

75. See Gostin et al., *supra* note 15, at 66.

76. See, e.g., FIDLER, *supra* note 38, at 114-220 (discussing international trade law as both empowering nations to protect itself from health threats coming through international trade and limiting the ability of those nations to misuse its power of protecting the public health).

77. See IOM REPORT, *supra* note 2, at 140 (reporting that the decline in state and local health department funding directly impacts the ability of the nation to combat infectious diseases); CENTERS FOR DISEASE CONTROL AND PREVENTION, *PREVENTING EMERGING INFECTIOUS DISEASES: A STRATEGY FOR THE 21ST CENTURY* 35 (1998) (recognizing the role of local health departments as being the "first line of defense" against infectious diseases).

78. See, e.g., Joseph Singer, *Property*, in *THE POLITICS OF LAW: A PROGRESSIVE CRITIQUE* 240, 249 (David Kairys ed., 3d ed. 1998) (noting that classical property law protects only the "right to have property," not the "right to get property").

and thus influence the distribution of infectious disease. Specific examples come readily to mind.

Data suggest that income inequality within a society is strongly associated with health.⁷⁹ United States tax policy, focused on taxing *income* rather than wealth, fundamentally favors the maintenance of wealth among the haves over the accumulation of wealth by the have-lesses and have-nots. This effect is apart from more particular policies that reduce the actual progressivity of the income tax.⁸⁰ The overwhelming data linking poor health and income inequality constitute serious health-based reasons for concern when economic policies seem to exacerbate or merely ignore substantial differences in the distribution of wealth either within a society or across borders.⁸¹

International trade rules contribute directly to two major sets of factors commonly identified in analyses of disease emergence and persistence: 1) economic dislocation, poor sanitation, and poverty in "source" countries, and 2) the

79. Refer to note 56 *supra*. Heterogeneity in wealth and socioeconomic status, rather than absolute levels of wealth or deprivation, appear to be decisive. Relatively poor countries with a more even distribution of wealth or social status have better health outcomes than comparable or even more affluent countries with greater heterogeneity. See Feinstein, *supra* note 56, at 30 (finding that researchers have determined less linkage between health and a country's aggregate income level than between the inequalities in socio-economic status within the country); Hertzman et al., *supra* note 59, at 70.

80. See, e.g., Martin J. McMahon, Jr. & Alice G. Abreu, *Winner-Take-All Markets: Easing the Case for Progressive Taxation*, 4 FLA. TAX REV. 1, 12-31 (1998) (discussing taxes and the distribution of income in the United States); Beverly I. Moran & William Whitford, *A Black Critique of the Internal Revenue Code*, 1996 WIS. L. REV. 751, 753 (1996) (arguing that tax code favors whites' wealth creation and preservation over African American wealth acquisition and preservation). An analysis by the Center on Budget and Policy Priorities found that income inequality is worsening in the United States:

The gap between rich and poor has grown into an economic chasm so wide that this year the richest 2.7 million Americans, the top 1 percent, will have as many after tax dollars to spend as the bottom 100 million.

That ratio has more than doubled since 1977, when the top 1 percent had as much as the bottom 49 million.

David Cay Johnson, *Gap Between Rich and Poor Found Substantially Wider*, N.Y. TIMES, Sept. 5, 1999, at 4.

81. Of course, the fact that health is generally better as economic homogeneity increases within a society does not mean that substantial wealth equality would lead to better health. Redistribution that substantially injured productivity or job creation might have countervailing effects. As Professor Cass Sunstein has noted, trade-offs are hardly to be avoided and must be a key consideration in making health policy decisions. See Cass Sunstein, *Health-Health Trade-offs*, 63 U. CHI. L. REV. 1533, 1550 (1996); see also Mary C. Daly et al., *Macro-to-Micro Links in the Relation Between Income Inequality and Mortality*, 76 MILBANK Q. 315, 316-17 (1998) (noting that various distributions of inequality do not have consistent health effects).

movement of pathogens through trade routes.⁸² Changes in land use and economic activity in developing countries, which contribute significantly to pathogen-human contact, are a direct result of the globalization⁸³ of markets and production under the current trade regime, as are the enhanced volume and speed of both movement of people and pathogens.⁸⁴ More broadly, the optimistic belief that economic development inevitably leads to a better life for the citizens of developing countries has been discredited by a far more ambiguous record:

At some point over the last 15 years, the vastly increased integration of international markets through new patterns of trade, finance, production and capital flows—along with an increasingly dense web of treaties and international institutions—produced a qualitatively different world economy. As footloose capital became less willing to fund the welfare state, and threatened to

82. See, e.g., Christopher P. Howson et al., *The Pursuit of Global Health: The Relevance of Engagement for Developed Countries*, 351 LANCET 586, 587 (1998).

83. Frank Garcia offers some useful definitions:

Taken most broadly, globalization represents the sum total of political, social, economic, legal and symbolic processes rendering the division of the globe into national boundaries increasingly less important for the purpose of individual meaning and social decision

....

In considering the globalization of the market, one can distinguish between the geographic facts of globalization, and the regulatory predicates and consequences of such globalization. One definition of market globalization, . . . “transactional globalization,” views the globalization of markets as an increase in the number of transactions involving goods, services, labor and capital which cross national boundaries, such that they come to resemble in operation a single market spanning the globe. This definition assumes that there has always been a certain amount of transboundary economic activity, but that such activity is increasing both in scope and scale such as to warrant the tag “globalization,” thus saying in essence that globalization is a quantitative rather than a qualitative change.

This common approach to defining economic globalization, however, represents only one aspect of economic globalization. Another definition, which shall be termed “regulatory globalization,” includes the quantitative changes identified in transactional globalization, but emphasizes a qualitative change in the nature of our regulation of markets. In particular, regulatory globalization focuses on the complex social processes which have led to the regulation of markets for goods, labor, capital and services at new levels, levels which require formalized interstate cooperation through new and powerful institutions like the WTO, and which may, in certain cases, transcend nation-state control to a significant degree, as in the case of the European Community.

Frank J. Garcia, *The Global Market and Human Rights: Trading Away the Human Rights Principle*, 25 BROOK. J. INT'L L. 51, 56-58 (1999) (footnotes omitted).

84. See IOM REPORT, *supra* note 2, at 68, 71-72, 77-78, (reporting that international shipments of food goods, changes in land usage, and travel to source countries create risks of the spread of some infectious diseases).

flee to more inviting jurisdictions, nations increasingly began to withdraw the safety nets that had allowed workers to tolerate the dislocations of globalization. Moreover, as a result of expanding International Monetary Fund (IMF) and World Bank mandates and ever more intrusive GATT disciplines, governments discovered that they had inadvertently subverted their ability to manage the dislocations caused by economic liberalization. The political result, as Multilateral Agreement on Investment proponents discovered, has been an unraveling of the social bargain that supported formation of the postwar international economy.⁸⁵

We may well be seeing the public health result in the rising toll of infectious disease.

Trade rules have traditionally been in some conflict with state disease control authority,⁸⁶ but today the globalization of trade and economic development under the GATT/WTO regime "has intensified economic competition and increased pressure on governments to reduce expenditures, including the funding of public health programs, leaving states increasingly unprepared to deal with emerging disease problems."⁸⁷ Fidler adds that "the loss of economic control arguably reduces the State's ability to counteract socio-economic problems such as poverty or urbanization or to slow down environmental damage resulting from economic activity."⁸⁸

Property rules under the world trade regime are also having harmful effects on the diffusion of effective technologies of disease prevention and control. Easy access under the free trade regime to cheap antibiotics in the third world has fostered antimicrobial resistance.⁸⁹ Conversely, intellectual property law, endowing drug makers with a temporary monopoly on new drugs, can make effective preventive medications inaccessible to poor countries. At this writing, for example, a debate is raging about the prohibitive price of AZT, which has been proven to

85. Jeffrey L. Dunoff, *Does Globalization Advance Human Rights?*, 25 *BROOK. J. INT'L L.* 125, 136 (1999) (footnotes omitted).

86. See FIDLER, *supra* note 38, at 61-64 (describing international public health law's competing objectives of maximum security and minimum interference with trade).

87. David Fidler, *Globalization, International Law, and Emerging Infectious Diseases*, 2 *EMERGING INFECTIOUS DISEASES* 77, 78 (1996).

88. FIDLER, *supra* note 38, at 16.

89. See Iruka N. Okeke et al., *Socioeconomic and Behavior Factors Leading to Acquired Bacterial Resistance to Antibiotics in Developing Countries*, 5 *EMERGING INFECTIOUS DISEASES* 18, 18-19 (1999); see also David P. Fidler, *Legal Issues Associated with Antimicrobial Drug Resistance*, 4 *EMERGING INFECTIOUS DISEASES* 169, 172 (1998).

substantially reduce rates of maternal-child transmission of HIV at birth,⁹⁰ but which is out of reach at current prices in the very countries with the highest rates of perinatal transmission.⁹¹

2. *Law Endows (or Fails to Endow) Individuals with Rights that Equip Them to Avoid Disease.* Human rights are increasingly recognized as important to providing social conditions in which people can be healthy.⁹²

Vulnerability to diseases like HIV reflects the extent to which people are, or are not, capable of making and effectuating free and informed decisions about their health. Therefore, a person who is able to make and effectuate free and informed decisions is least vulnerable. Conversely, the person who is ill informed, and with quite limited ability to make and/or carry out decisions freely arrived at, is most vulnerable.⁹³

Many human rights, including autonomy, equality, economic opportunity, education, free access to information, and freedom of assembly, directly influence the degree to which individuals and communities are able to learn about and act upon risks to their health.⁹⁴

In 1996, the United Nations High Commissioner for Human Rights and the Joint United Nations Programme on HIV/AIDS convened an international group of health and human rights experts to develop guidelines for how human rights law could be

90. See Rhoda S. Sperling et al., *Maternal Viral Load, Zidovudine Treatment, and the Risk of Transmission of Human Immunodeficiency Virus Type 1 from Mother to Infant*, 335 NEW ENG. J. MED. 1621, 1621 (1996).

91. See Simon Burber, *Stars & Stripes—SA Between a Rock and a Hard Place on TRIPS Arrangement*, BUS. DAY (SOUTH AFRICA), Aug. 18, 1999, available in 1999 WL 21400088 (reporting that some countries have been pressured to reject the use of multiple import channels to obtain inexpensive pharmaceuticals); *South Africa's Government's Lack-Luster AIDS Policy*, AIDS WKLY. PLUS, June 28, 1999, available in 1999 WL 10041188 (reporting that South Africa refuses to provide AZT to pregnant mothers because the treatment is cost-prohibitive).

92. See LAWRENCE O. GOSTIN & ZITA LAZZARINI, HUMAN RIGHTS AND PUBLIC HEALTH IN THE AIDS PANDEMIC 44-46 (1997); George J. Annas, *Human Rights and Health—The Universal Declaration of Human Rights at 50*, 339 NEW ENG. J. MED. 1778, 1779-80 (1998); Jonathan M. Mann, *Medicine and Public Health, Ethics and Human Rights*, HASTINGS CENTER REP., May-June 1997, at 6, 10.

93. Jonathan M. Mann, *Human Rights and AIDS: The Future of the AIDS Pandemic*, 30 JOHN MARSHALL L. REV. 195, 199-200 (1996). "Modern human rights involves the world's first efforts, necessarily incomplete and partial, to define the societal preconditions for human well-being." *Id.* at 203.

94. See OFFICE OF THE U.N. HIGH COMM'R FOR HUMAN RIGHTS & THE JOINT U.N. PROGRAMME ON HIV/AIDS, HIV/AIDS AND HUMAN RIGHTS: INTERNATIONAL GUIDELINES 40-57 (1998) (describing the relevance of numerous human rights in the context of the HIV/AIDS epidemic).

deployed to prevent HIV.⁹⁵ These groundbreaking guidelines, published in 1998, provide numerous examples of how human rights protection influences vulnerability to disease.⁹⁶

The discussion of the rights of women is typically illuminating:

Discrimination against women, de facto and de jure, renders them disproportionately vulnerable to HIV/AIDS. Women's subordination in the family and in public life is one of the root causes of the rapidly increasing rate of infection among women

. . . .

With regard to prevention of infection, the rights of women and girls to the highest attainable standard of physical and mental health, to education, to freedom of expression, to freely receive and impart information, should be applied to include equal access to HIV-related information, education, means of prevention and health services. However, even when such information and services are available, women and girls are often unable to negotiate safer sex or to avoid HIV-related consequences of the sexual practices of their husbands or partners as a result of social and sexual subordination, economic dependence on a relationship and cultural attitudes. The protection of the sexual and reproductive rights of women and girls is, therefore, critical. This includes the rights of women to have control over and to decide freely and responsibly, free of coercion, discrimination, and violence, on matters related to their sexuality, including sexual and reproductive health. Measures for the elimination of sexual violence and coercion against women in the family and in public life not only protect women from human rights violations but also from HIV infection that may result from such violations.⁹⁷

95. See *id.* at 1, 3.

96. See *id.* at 5, 39-57.

97. *Id.* at 44-45 (footnotes omitted). The influence of women's status on public health is striking, and it is independent of the absolute level of economic well-being in a nation:

Costa Rica, Sri Lanka, and Kerala state in India, for example, have about the same average level of income as Pakistan, Afghanistan, and Morocco. Yet the infant mortality rates for the former group average 64 per 1,000 live births, compared with 173 in the latter. Average life expectancy is 61 years in the first group, 45 in the second.

The difference seems to be that countries with better health status have placed a greater emphasis on the importance of women and children in their culture and social environment, and in their social policies. Several

Like women, African Americans in the United States suffer the health consequences of the poor observance of many of their internationally recognized human rights.

The interplay between residential segregation and the political and social organization of cities produces structural constraints that limit black life chances. Limitations on black spatial mobility constrain even the more affluent African Americans by restricting their access to employment opportunities, relegating their children to inferior schools, and exposing them to greater environmental health risks. Thus, regardless of economic resources, many middle-income African Americans are forced to live in socioenvironmental conditions that—although superior to those of low-income blacks—are not consistent with their economic status.⁹⁸

The persistence of racism is surely a major factor in the toll that infectious disease takes among African Americans⁹⁹ who comprise a strikingly disproportionate share of cases of serious diseases like HIV,¹⁰⁰ tuberculosis,¹⁰¹ and syphilis.¹⁰²

observers have suggested that it is only when women are sufficiently educated to experience some sense of control over their lives and those of their children (e.g., being able to achieve child spacing) that infant and child mortality rates really begin to fall.

Hertzman et al., *supra* note 59, at 70-71 (citations omitted).

98. Thomas LaVeist, *Segregation, Poverty, and Empowerment: Health Consequences for African Americans*, 71 MILBANK Q. 41, 55 (1993) (citations omitted); see also Norman J. Waitzman & Ken R. Smith, *Separate but Lethal: The Effects of Economic Segregation on Mortality in Metropolitan America*, 76 MILBANK Q. 341, 361 (1998) (finding that living in urban areas of concentrated poverty was significantly associated with poorer health outcomes).

99. See Vicente Navarro, *Race or Class Versus Race and Class: Mortality Differentials in the United States*, 336 LANCET 1238, 1238 (1990) (arguing that mortality differentials among the races in the United States are based, in part, upon racial and social class membership).

100. NATIONAL CENTER FOR HIV, STD AND TB PREVENTION, CENTERS FOR DISEASE CONTROL AND PREVENTION, HIV/AIDS SURVEILLANCE REP. 14-15 tbls. 7-8 (1999) (reporting that in the United States, the African American population comprised about 37% of the AIDS cases and about 50% of the reported HIV cases, whereas the white population comprise about 44% of the AIDS cases and 38% of the HIV cases).

101. NATIONAL CENTER FOR HIV, STD AND TB PREVENTION, CENTERS FOR DISEASE CONTROL AND PREVENTION, REPORTED TUBERCULOSIS IN THE UNITED STATES 10 tbl. 3 (1999) (reporting that the incidence of tuberculosis in the U.S. in 1998 was approximately eight-fold higher in the African American population as compared to the white population).

102. NATIONAL CENTER FOR HIV, STD AND TB PREVENTION, CENTERS FOR DISEASE CONTROL AND PREVENTION, SEXUALY TRANSMITTED DISEASE SURVEILLANCE 56 (1999) (reporting that the rate of syphilis in the United States in 1997 was approximately 34-fold higher in the African American population as compared to the white population).

Rights fundamentally influence the efficacy of individuals and communities in fighting disease, not just because they facilitate information flow and protect choice, but because they help constitute a world in which knowledge and choice are meaningful and useful, a world in which there is hope for a better future. Jonathan Mann has written:

The history of the response to HIV has demonstrated that we can bring the best of traditional public health together with new societal insights and understanding. This brings us to the threshold of *empowerment*, which is a critical concept not only for others, but also for ourselves. This empowerment rests on two pillars. One is knowledge: an understanding of the importance of societal determinants of health, of the ways in which human rights helps us to analyze and respond to societal deficiencies which underlie vulnerability to preventable disease, disability and premature death. The second pillar is equally critical: the belief, the faith and the confidence that the world can change. This belief, while it may be inspired by historical examples, or fostered by peers and participation in community organization and social movements, is ultimately quite personal. It is not clear exactly how people who have considered themselves powerless may begin to believe in the *possibility of change*, but this step is at the heart of personal and ultimately, societal transformation.¹⁰³

3. *Law Regulates the Meaning of Identities and Behaviors, Categorizing Some as Favored and Others as Disfavored.* To adopt a structural analysis of health is to see illness as a product of how a society lives. Illness in this view is not an aberration but a byproduct, somewhat preventable if we understand its mechanisms and treatable if we have effective responses, but subject to elimination only if we change the causal practices. Hence, changing disease determinants structurally entails changing pleasurable, rewarding, enriching, "normal," and apparently nonthreatening behaviors, as well as altering a whole set of tangible and intangible social cues and rewards for engaging in those behaviors. This makes structural analysis a deep challenge to the status quo and places the effort to address the roots of infectious disease squarely in the arenas of politics, economics, and culture.

Law operates to create and preserve social relations of status and power, not simply through the direct regulation of behavior,

103. Mann, *supra* note 93, at 205-06.

but also through “the regulation of social meaning.”¹⁰⁴ In this view, law is woven into everyday life. It controls less through coercion than through voluntary compliance and is felt less as a set of explicit rules than as a mass of commonplace assumptions about what is right, appropriate, or natural to do.¹⁰⁵

Law can be part of the problem, but may also be deployed to influence the meaning of health-related acts and actors. The most notable current example of law being deliberately used to regulate social meaning is perhaps law’s role in changing smoking from a sophisticated pastime of the best and brightest in chic night clubs to the antisocial addiction of the poorly educated congregated in doorways and barren smoking rooms.

HIV has provided numerous instances of law as the problem. Some researchers believe that the stigmas of homosexuality and drug use have contributed to the vulnerability of gay men and drug users to HIV and that laws punishing these behaviors have made matters worse.¹⁰⁶ Gary Marks, Thomas Peterman, and I have discussed the possible impact of legal structures on HIV. For example, numerous studies point to the health benefits of reducing the number of sexual partners. HIV among gay men would arguably decline significantly if more gay men were in long-term monogamous relationships. Yet

[t]o point to the protective value of long-term stable relationships is to highlight the fact that American social policy has prevented such relationships among gay men. Gay sexual behavior has been shaped by social hostility toward homosexuality and by the use of law and other forms of social control to express that hostility. Gay men can still be prosecuted in some states for having sex, and, in all but 10 states and the District of Columbia, a

104. See Lawrence Lessig, *The Regulation of Social Meaning*, 62 U. CHI. L. REV. 943, 943 (1995). See generally PIERRE BOURDIEU, *OUTLINE OF A THEORY OF PRACTICE* 31-32, 87-88 (Richard Nice trans., Cambridge Univ. Press 1977) (setting out a comprehensive social theory).

105. See PATRICIA EWICK & SUSAN S. SILBEY, *THE COMMON PLACE OF LAW: STORIES FROM EVERYDAY LIFE* 17-18 (1998).

106. See COMMITTEE ON A NATIONAL STRATEGY FOR AIDS, INSTITUTE OF MEDICINE, *CONFRONTING AIDS: DIRECTIONS FOR PUBLIC HEALTH, HEALTH CARE AND RESEARCH* 59 (1986) (discussing the presence of institutional discrimination against homosexuals in the form of state sodomy laws and noting the United States Supreme Court’s upholding of a state’s right to pass such laws); *id.* at 133 (concluding that AIDS and its accompanying stigma have led to many varieties of discrimination, including access to social services). For discussions of stigma as a factor in law and HIV policy, see Scott Burris, *Law and the Social Risk of Health Care: Lessons from HIV Testing*, 61 ALB. L. REV. 831, 889 (1998); Scott Burris, *Studying the Legal Management of HIV-Related Stigma*, 42 AM. BEHAV. SCIENTIST 1229, 1229 (1999); Gregory M. Herek et al., *AIDS & Stigma: A Conceptual Framework and Research Agenda*, 13 AIDS & PUB. POL’Y J. 36, 42 (1998).

person living openly in a gay relationship has no protection from discrimination A huge array of legal rules and social practices provide incentives to heterosexuals to form relationships that are intended to be permanent and monogamous. Through the civil status of marriage, heterosexual couples acquire tangible economic benefits ranging from favorable rules of property ownership and inheritance, to insurance benefits, to parental rights. Virtually all of these are denied to gay men¹⁰⁷

Reducing the threat of infectious disease will require changes in everything from food preparation practices, through sexual behavior, to the way physicians and patients make decisions about using antibiotics. To a greater or lesser extent, law will have some regulatory say in these behaviors, but more broadly, it has the potential to help shape the meaning of the behavior for good or ill.

4. *Law Provides Settings (Legislatures, Bureaucracies, and Courts) in Which Important Social Issues Are Debated and a Vocabulary for Debating Them.* Disease prevention often touches sensitive political nerves, particularly, but not exclusively, when structural interventions are on the agenda.¹⁰⁸ At the best of times, underlying conflicts over priorities and risks provide a difficult context for disease control. David Fidler has shown how, for well over a century, a "Microbialpolitik" of tension between unfettered trade and disease control has structured (not to say, crippled) the international response to communicable disease.¹⁰⁹ Allen Brandt's history of U.S. venereal disease control has similarly documented how efforts to control venereal disease were frustrated again and again by conflicts over whether the main goal was to reduce disease or to reduce illicit sex.¹¹⁰

Often, moreover, disease control debates within government are subsumed into larger conflicts that have little or nothing to do with health. Dan Kahan of Yale Law School has argued that HIV policymaking is frequently a battleground in the competition among social factions for normative dominance, in which embodying certain contested norms in legislation (such as

107. Scott Burris, *Gay Marriage and Public Health*, 7 TEMP. POL. & CIV. RTS. L. REV. 417, 424-25 (1998).

108. See Gostin et al., *supra* note 15, at 93.

109. See David P. Fidler, *Microbialpolitik: Infectious Disease and International Relations*, 14 AM. U. INT'L L. REV. 1, 13, 18, 22, 27 (1998); see also FIDLER, *supra* note 38, at 21-57.

110. See BRANDT, *supra* note 65, at 6.

prohibiting HIV education that “promotes” homosexuality) is a proxy for success in the underlying *Kulturkampf*.¹¹¹ To the extent that the governmental legal processes provide an opportunity for groups to contest normative dominance, health issues that necessarily touch upon matters of behavior, choice, and identity are prime battlegrounds.¹¹²

Part of normative dominance is the ability to impose a vocabulary on political debaters—“spin” to the *n*th power, systematic, and durable. In *The Invisibility of Public Health*, I argued that prevailing political rhetoric on the role of the market and the importance of individual choices—what I called “market individualism”—operated within cultural and political discourse to obscure the collective stake in population-level health measures.¹¹³ The conclusion suggests how the law’s role as both forum and lingua franca can be harnessed to address the political and social conditions that hinder structural legal interventions:

Political discourse offers a set of cultural norms about what it means to live in our society, to whom help is owing, and whence any help should come. In defining the bounds of relevance in terms of individuals striving in an unfettered market for personal satisfaction, market individualism renders the collective stake in public health invisible and unnamable.

By focusing on the mechanism by which public health disappears, rather than the cultural product from which it is absent, I aim to get past the notion that market individualism is an immutable trait deep in the “American character” that must be accepted as “reality.” The important question, I suggest, is not what people

111. See Dan Kahan, Using Law to Regulate Behavior: AIDS and the Criminalization of Sex, Yale Center for Interdisciplinary Research on AIDS (Apr. 8, 1999) (conference transcript on file with author and the *Houston Law Review*). Professor Kahan draws upon Joseph R. Gusfield’s work on law as a field of social-status conflict. Important works in this area include JOSEPH R. GUSFIELD, *SYMBOLIC CRUSADE: STATUS POLITICS AND THE AMERICAN TEMPERANCE MOVEMENT* (2d ed. 1986) and Joseph R. Gusfield, *On Legislating Morals: The Symbolic Process of Designating Deviance*, 56 CAL. L. REV. 54 (1968).

112. For a discussion of the cultural struggle underlying the gun-control debate, see Dan M. Kahan, *The Secret Ambition of Deterrence*, at 43-55 (unpublished manuscript, on file with author and the *Houston Law Review*).

113. See Scott Burris, *The Invisibility of Public Health: Population-Level Measures in a Politics of Market Individualism*, 87 AM. J. PUB. HEALTH 1607, 1609 (1997). Frank Garcia makes a similar point about the conflict between the conceptual underpinnings of human rights and international trade law. See Garcia, *supra* note 83, at 73 (summarizing the conflict between the utilitarian-rooted, economic-based structure of international trade law and the structure of human rights law, which is based upon adherence to the principles of human dignity and worth).

think now, but how they came to think it, and the answer is the same as for other attitudes and behaviors: they were taught. Individualism is not genetic. There is no market miasma emanating from the North American continent. Ideas like the ones that dominate American politics are inculcated consciously and unconsciously in school, work, family, and the social interaction of daily life. The purveyors of the political heuristic I have described in this paper have worked for long years to bring their ideas from the unthinkable to the statute books.

Seen in this way, the task for public health advocates is a familiar one: the slow, diffuse job of changing social attitudes, in this case by developing effective alternative ways of understanding the social and physical ecology. Such a vision is built in part on basic research choices, as Link and Phelan have discussed in detail. In the political field, it entails showing at every opportunity how the market puts our health at risk, how individual choices are mediated by social and cultural conditions, and how the welfare of the community can diverge from the welfare of the individual. Even before the first step is taken, however, the project requires that public health advocates themselves recognize the way in which modes of thought, such as market individualism, have made public health unthinkable and how alternative ways of thinking are a necessary, if not sufficient, condition to revitalizing it.¹¹⁴

Structural analysis places the responsibility for public health squarely on the collective, demanding not simply that individuals be responsible (although this is important), but that communities and nations take responsibility for providing the conditions under which individuals can make healthy choices.¹¹⁵ The persistence of infectious disease presents a particular challenge to law to deploy conceptions of human rights and distributive justice to give form and salience to social responsibility for the conditions of health.¹¹⁶

114. Burris, *supra* note 113, at 1609 (footnote omitted).

115. See, e.g., Marks et al., *supra* note 42, at 297-304 (discussing social responsibility for HIV).

116. For an example, see Sarah Marchand et al., *Class, Health, and Justice*, 76 MILBANK Q. 449 (1998).

B. Four Questions for the Future.

Structural analysis is just beginning to have an impact on public health policy and faces substantially more than the usual set of difficulties in public health practice. The time is right to begin the legal work required to make structural interventions possible through law. At this early stage, four questions present themselves. These questions are not simply, or even predominantly, questions that lawyers can answer. Indeed, to answer them will require collaboration across the disciplines of public health, including epidemiology, sociology, social psychology, political science, and law.

1. What Legal Structures Can Plausibly Be Linked to Infectious Diseases in the Population? Law pervades our society, so its effects often have as much to do with what we take for granted as what we do because we know it is required. Likewise, there are policies explicitly directed at influencing health behavior that apparently do not meet their objective, and policies apparently having little to do with infectious disease that may have a substantial role. In the future, work based upon socio-legal theory and social epidemiology could help identify plausible legal effects for further research and could guide policy that necessarily proceeds on educated guess and intuition while data is gathered.

2. Through What Mechanisms Do Legal Structures Matter and How Can We Intervene? It is one thing to show associations between legal structures and health outcomes at a more-or-less broad level of generalization. Very often, it may be difficult to develop strong proof of causation. Social theory can help by providing an account of the possible mechanisms through which law operates, which can then be used to test the hypothesis empirically and to guide "natural experiments" in policy.

3. How May We Effectively Make the Case for Intervention in a Culture Unfamiliar with Structural Analyses? Structural analysis is itself politically controversial, and it produces policy prescriptions that question the status quo. Finding ways to make structural interventions socially and politically acceptable is an independent and important part of the public health effort. As the foregoing discussion has suggested, law and lawyers have a role in this because of the law's function as a site and vocabulary of normative discourse. Over the long term, the case for structural change can be made, one hopes convincingly, in

terms of mutual responsibility, respect for human rights, and social justice, not to mention less altruistic themes like self-protection.

4. *How Do We Measure the Success of Structural Changes in Complex Social Processes?* Public health efforts traditionally depend upon data, not just for their form and targets, but for their justification. Structural interventions cannot become an important part of public health, let alone win public and political backing, unless they can show measurable success. This presents a difficult challenge to epidemiologists, who are, however, taking it up with considerable depth and creativity.¹¹⁷

V. CONCLUSION

Public health advocates owe a debt of gratitude to the popular accounts of epidemic disaster. The Filoviruses, including Ebola and Marburg, have been grist for vivid accounts of painful death and the threat of rapid spread. Someone contracts the virus in the African bush, hops a plane to New York, starts to vomit on the plane (spewing deadly virus throughout the cabin), wanders the streets of Gotham in a contagious haze, arrives at the hospital spewing blood from every pore, and pretty soon dozens or hundreds of people have "crashed and bled out."¹¹⁸ This story of an acute and unstoppable epidemic is great public relations, but it is not the way most diseases will present themselves as major threats to large populations.

Why not? There are definite biological reasons, notably the evolutionary fact that the microbes that colonize our bodies lose their home when we die.¹¹⁹ A disease that takes years to kill and

117. See, e.g., Hertzman et al., *supra* note 59, at 67, 79-80 (applying a socioeconomic status health model "to explore the connection between measures of health status, and the incidence or prevalence of particular diseases"); see also, e.g., Link et al., *supra* note 54, at 380 (studying whether access to and utilization of cervical and breast cancer screening tests is dependent upon socioeconomic status).

118. See, e.g., PRESTON, *supra* note 12, at 28 (detailing the sudden drop in blood pressure and the hemorrhaging of the central brain, collectively known as "crashing and bleeding out"); Fidler et al., *supra* note 50, at 789-91.

119. We survive our relationship with bugs for the same reason that bad human relationships last—we need each other. Nobel-prize winner Joshua Lederberg, having recounted all the advantages that microbes seem to have over humans, and that are fodder for doomsday tales asks:

So why are we still here? With very rare exceptions, our microbial adversaries have a shared interest in our survival. With very few exceptions (none among the viruses, a few among the bacteria, perhaps the clostridial spore-forming toxin producers), almost any pathogen reaches a dead end when its host is dead. Truly severe host-pathogen interactions historically have resulted in elimination of both species. We are the

spreads during a long asymptomatic stage is far more efficient from the microbial point of view than a virulent, quick-acting destroyer that rapidly debilitates (and thus marks) its host. HIV, not Ebola, is the scourge of Africa.

Structural analysis suggests that people are also protected by wealth, social organization, and the capacity to shift the negative consequences of their modes of production and consumption to others. Developed countries have public health and health care infrastructures that are up to dealing with the threat of even very contagious, catastrophic diseases. In real life, the person with Ebola gets to a hospital right off the plane, and it does not take too long to diagnose his affliction as serious. Hospitals all have isolation capacity, there is a health department at the end of the phone line, and there exists the Centers for Disease Control and Prevention, all of which mean that the outbreak can be quickly contained.¹²⁰ More broadly, society is structured to keep infectious diseases concentrated at the bottom of both the intra- and international social ladders. From our sewers, to our houses, to our food processing systems, we in the United States protect ourselves from disease simply by being among the world's haves and not its have-nots. Even within our own borders, our best protection against infectious disease is relative wealth, which gives us the information, the motivation, and the capacity to lead maximally safe lives. To be sure, money itself does not insulate any one person against the flu or a hospital infection, or from acquiring TB on an airliner, but outside the covers of hair-raising books about the disease threat, wealth is about as good a vaccine against disease as anything created in a medical laboratory. Controlling infectious diseases in the United States thus requires two different strategies that are, to some degree, in tension: using our socioeconomic and technological advantages to track and control disease, and at the same time, sharing that wealth in ways that reduce the toll of inequality and poverty.

Structural analysis tells us a great deal about the deep factors that produce persistent patterns of preventable illness and premature mortality. The harder part is finding ways to move from structural analysis to active structural intervention to change the factors. The problem increases as we move back on the chain of causation from very specific behavior that reflects

contingent survivors of such encounters, because of this shared interest. Lederberg, *supra* note 19, at 366.

120. See IOM REPORT, *supra* note 2, at 79 box 2.5 (providing an account of this type of event).

social forces (smoking is a prime example in health) to broad factors like socioeconomic status that operate through many intermediate ones. Law plays an important role both as one of the intermediate causes of disease and as a potential tool for addressing structural factors effectively.