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TOOLS AND TECHNIQUES

Law as a Tool for Preventing Chronic Diseases: Expanding the Spectrum of Effective Public Health Strategies

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Part 1 of 2

Abstract

Law, which is a fundamental element of effective public health policy and practice, played a crucial role in many of public health's greatest achievements of the 20th century. Still, conceptual legal frameworks for the systematic application of law to chronic disease prevention and control have not been fully recognized and used to address public health needs. Development and implementation of legal frameworks could broaden the range of effective public health strategies and provide valuable tools for the public health workforce, especially for state and local health department program managers and state and national policy makers. In an effort to expand the range of effective public health interventions, the Centers for Disease Control and Prevention will work with its partners to explore the development of systematic legal frameworks as a tool for preventing chronic diseases and addressing the growing epidemic of obesity, heart disease, stroke, and other chronic diseases and their risk factors.

Introduction

This paper examines the potential need for and role of systematic legal frameworks in preventing and mitigating

chronic diseases. In part 1 of this 2-part series, we describe the role and use of laws, as well as the demonstrated effectiveness of laws, in supporting selected public health interventions. In part 2, we will provide an overview of U.S. jurisprudence and legal methods relevant to public health problems and outline potential contours of legal frameworks adaptable to chronic disease prevention by offering examples from different public health domains.

The terrorist attacks of fall 2001 and events since then, including the epidemic of severe acute respiratory syndrome (SARS), have focused immense attention on public health legal preparedness and on the role of law in assuring the public's health (1,2). One prominent example is a renewed interest in quarantine, including the adequacy of relevant legal authorities and due process protections. In addition to the highly visible legal aspects of such recent problems involving acute diseases, seminal work is underway to provide options for strengthening laws essential to public health infrastructure and public health practice (3). Other commentators have examined the roles of specific legal processes, such as litigation, and of legal frameworks as tools for addressing public health problems (4,5).

Efforts of the Centers for Disease Control and Prevention (CDC) in relation to the heightened interest in the role of law in public health practice are centered in its own Public Health Law Program and in several other CDC programs, including the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). These efforts broadly encompass approaches to assist public health practitioners at all levels to improve their understanding of the legal foundations of public health and to develop their ability to use systematic legal frameworks and laws for achieving program goals and objectives.

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Achieving comprehensive public health legal preparedness to address public health emergencies is an important goal of this endeavor. Public health legal preparedness can be defined as a public health system's attainment of specified legal benchmarks or standards essential to the preparedness of the public health system. The core elements of public health legal preparedness (Table 1) are relevant and applicable to legal preparedness in other, non-acute domains of public health, including chronic disease prevention (1).

In addition to the prominent role laws have played in response to recent public health emergencies, laws have contributed significantly to many notable public health achievements (6-8). Examples of such critical contributions include the landmark 1905 U.S. Supreme Court decision, *Jacobson v Massachusetts*, which upheld the constitutionality of compulsory immunization; federal requirements for fortification of foods; the Safe Drinking Water Act of 1974; warning notices on cigarette packs; and seat belt laws (6,9). Despite the historically important role for law in public health and the rapidly growing number of publications on the subject, conceptual frameworks for the application of law to public health have not yet been fully explicated, and their benefits remain only partly realized. With few exceptions, systematic legal frameworks have not been developed for preventing chronic diseases and their major risk factors.

Although the term "legal framework" is given further definition later in this 2-part article, we use this term to broadly connote a conceptual approach for addressing public health problems through logical and rational combinations of legal dimensions — including but not limited to U.S. jurisprudence, basic sources of U.S. law, legal theories, and legal mechanisms and tools — which are appropriately tailored to a specific public health problem. The term law as used here may take the form of constitutional provisions, statutory enactments, regulations, ordinances, government-initiated litigation, court rulings, or policies adopted by public-sector bodies such as school and zoning boards. Law also includes policies or treaties adopted by international bodies.

Discussion

The Role of Law in Addressing Selected Public Health Interventions

Two overarching goals of our national public health

agenda are to increase the quality and number of years of healthy life and to eliminate health disparities (10). For chronic diseases, these goals necessitate a comprehensive strategy that includes interventions for prevention and control of categorical diseases and their risk factors, individual behavioral change, environmental change, improvements in clinical and preventive services, and organizational change (11). Promoting patient compliance and health providers' adherence to established best practices in all persons — regardless of patients' racial/ethnic background, sex, geographic determinants, or socioeconomic status — is also important. These interventions can be accomplished through a variety of mechanisms, including health education, development and use of information systems, and development and implementation of policies and guidelines. Policies, in turn, can be implemented as regulations, ordinances, other laws, or as organizational practices.

Achievement of these overarching national goals requires a strengthening of the public health infrastructure and development of adequate capacity to undertake the core public health functions of assessment, policy development, and assurance (12). In all of these areas, the role of law can be crucial. For example, identifying and strengthening key components of the public health infrastructure — such as the development of a diverse and competent public health workforce, information and communication systems, and health department surveillance and laboratory capacities — can be important purposes of appropriate legislation (13,14). Similarly, legislation can help provide state or local governments with the power to encourage or induce health care providers, allied health professionals, and businesses to promote and protect the public's health in order to increase the quality and number of years of healthy life (15). Laws can play pivotal roles in the elimination of disparities in access to and delivery of quality health care (16-18). In addition, appropriate laws undergird the broader mission of state and local public health agencies in assessing the burden of chronic diseases, setting priorities, allocating resources, and delivering health services (14).

Laws work to achieve their desired results in a variety of ways. Some laws directly require a behavioral change on the part of individuals in the target population — such as seat belt laws — whereas others directly change the environment — such as community water fluoridation or food fortification laws — and require no new action on the part

of the target population to be effective. Other laws are more complex in their mechanism of inducing a change. For example, some laws, such as smoking bans, require a behavioral change that ultimately results in an environmental change with beneficial effects on the target population. Other laws require an organizational policy change that ultimately leads to a behavioral change, such as required insurance-industry coverage of smoking cessation services, a requirement that leads to an increased demand for and delivery of the services, which eventually yields greater cessation rates. These examples and still other laws have been used to address chronic diseases and injuries (Table 2). As discussed in the following sections, 3 of these laws — smoking bans, blood alcohol concentration (BAC) laws, and food fortification regulations — demonstrate the impact and effectiveness of legislation on specific public health problems. A fourth example, a legal framework for tobacco control, illustrates the potential role of international law to address chronic diseases and their major risk factors.

1. Smoking bans and restrictions

Tobacco use is the single largest cause of preventable premature death in the United States (11,21,22), and exposure to environmental tobacco smoke (ETS) is an important preventable cause of illness and death (23-25). Reducing smoking indoors is one means to reduce exposure to ETS, and this outcome can be brought about by policies, regulations, or laws. Smoking bans, which prohibit smoking entirely, and restrictions, which limit smoking to designated areas, were thus developed to limit smoking in workplaces and other public areas.

Complex mechanisms underlie the relationship between smoking bans or restrictions and chronic disease prevention. To start, the laws require a change of behavior on the part of smokers who must delay or avoid smoking in indoor settings. This behavioral change, in turn, results in an improved environment and thus does not require individuals in the target population to take any action. For smoking bans and restrictions to be effective, they must bring about a measurable improvement in the environment — specifically, reductions in exposure to the components of ETS, such as nicotine vapor.

To investigate whether there was measurable improvement in the environment, Hopkins and colleagues conducted a systematic literature review as part of the *Guide to Community Preventive Services* (26). They identified 10

studies that evaluated the effect of smoking bans in workplaces. The studies showed an average 72% reduction in exposure to components of ETS. Smoking bans were more effective in reducing ETS exposures than were smoking restrictions, and bans were effective in a wide variety of public and private workplaces and health care settings. These findings suggest that the effectiveness of smoking bans should extend to most indoor workplaces in the United States.

2. Laws on blood alcohol concentration

In 2000, alcohol-related motor-vehicle crashes resulted in 17,380 deaths and more than 300,000 injuries in the United States (27). The BAC at which the majority of drivers are impaired can be established as the legal *per se* limit for motor vehicle operation (illegal *per se* means that a BAC above the set limit is a violation in and of itself and that actual impairment need not be demonstrated). Until recently, most states set this level at 0.1%. As early as 1983, however, some states lowered the BAC limit to 0.08%.

BAC laws are hypothesized to exert their effect primarily through powerful psychological deterrence of alcohol consumption (28). Most drivers are never stopped and tested for suspected alcohol-impaired driving (28). By virtue of their threatened penalties (e.g., loss of driver's license, jail time, fines, public humiliation), these laws deter drivers from consuming alcohol or cause them to limit their consumption before driving.

Because of the hypothesized mechanism of action of these laws, and because such a small proportion of drivers is ever stopped and tested for suspected alcohol-impaired driving, establishing the effectiveness of 0.08% BAC laws requires measurable reductions in alcohol-related motor-vehicle crashes. In particular, fatal alcohol-related crashes provide a sensitive measure of the effectiveness of 0.08% BAC laws. A systematic literature review conducted as part of the *Guide to Community Preventive Services* identified 9 studies that evaluated the effectiveness of 0.08% BAC *per se* laws (29). Each study evaluated 0.08% BAC laws in one or more of the 16 states that implemented the laws before January 1, 1998. After implementation of the laws, the median decrease in fatal alcohol-related motor-vehicle crashes was 7%. On the basis of these studies, the estimated number of lives that could be saved annually if all states were to enact 0.08% BAC laws ranges from 400 to 600.

3. Food fortification for the prevention of nutritional deficiency diseases

Regulation has played a substantial role in reducing and eliminating nutritional deficiency diseases in the United States. At the outset of World War II, the high percentage of recruits who were ineligible for military service because of nutritional deficiency diseases prompted the Council on National Defense to request that the National Academy of Sciences establish a Food and Nutrition Board (FNB)(30). At the time, niacin deficiency accounted for approximately 100,000 cases of pellagra annually, and pellagra was the eighth or ninth leading cause of death in many southern states (31). The cause of pellagra was unknown before 1937 (32). One of the first activities of the FNB was to establish recommended intake levels of approximately a dozen nutrients, including niacin. Enrichment of bread was effected by the Food Distribution Order No. 1 issued on December 29, 1942, which became effective January 18, 1943. Several states instituted mandatory enrichment laws for bread and flour at the same time (31). Enrichment laws were followed in a short time by a decrease in pellagra-related morbidity and mortality. More recently, in 1998, the Food and Drug Administration mandated the addition of 140 mcg of folic acid per 100 gm of cereal-grain products (33) to reduce the prevalence of neural tube defects (NTDs) (20). This strategy appears to have produced a 19% reduction in the frequency of NTDs (20).

4. International legal framework for tobacco control

Policy interventions offer a great opportunity to influence decisions on tobacco use at the societal level. Experience in the United States and in other developed countries indicates that policy interventions have a substantially greater impact than do interventions that target individuals. International law now represents a tool for such policy interventions. International law can be defined as the rules that regulate the relations among sovereign states and other actors (e.g., international organizations and individuals) in the international system (34). Treaties — written agreements among sovereign states, the obligations of which are legally binding — are one of the classic sources of international law (34).

In 1999, the World Health Organization (WHO) initiated the Framework Convention on Tobacco Control (FCTC) as an international treaty focusing on a health issue (34). In May 2003, the treaty text of the FCTC was unanimously adopted by the World Health Assembly (35). This landmark health treaty will be put into force when 40 member

states have signed and ratified it. The FCTC is both an international legal framework for tobacco control (e.g., addressing international cigarette smuggling issues) and a framework for a broad range of legal, regulatory, and policy approaches (e.g., excise taxes, clean indoor air policies, restrictions or bans on advertising and promotion, package warnings and labeling, product regulations, and ingredient disclosures) that all WHO member states are encouraged to implement.

Rationale for Legal Frameworks

The examples discussed above demonstrate the value of laws and regulations in preventing and controlling diseases and injuries, as well as the effectiveness of laws in helping to achieve program goals and objectives. In addition, they highlight the rationale and need for more comprehensive, systematic frameworks of legal theories and authorities to support the prevention and control of a broader array of chronic diseases (36).

The basic elements of a conceptual legal framework include definitions of key terms, delineation of scope, and articulation of a logic model or chain of causation. A logic model for the role of law in chronic disease prevention could trace the flow of causality involving laws, agents of intervention (i.e., the entities to which laws apply), the behavior of those agents (some behaviors affect the sources of chronic disease while others affect those susceptible to chronic disease), and health outcomes or status. Successful identification and implementation of legal frameworks based on this logic model depend, in part, on a fuller understanding of the spectrum of legal theories and methods relevant to public health practice.

Caveat lector

It is important to emphasize that the use of legal frameworks in public health practice has limitations. Nor can law alone prevent chronic diseases. The process by which laws are passed sometimes can be arduous and fraught with controversy. Even when appropriate legislation is eventually enacted, the levels of application and enforcement can vary a law's effectiveness in achieving the intended public health goals. Legal frameworks and laws should therefore not be used in isolation but should be viewed as only one of several tools to be employed in the public health practice armamentarium.

Conclusion

Laws have played a decisive and fundamental role in advancing the public's health. Their contribution is particularly evident in the prevention and control of communicable diseases, which were the leading causes of death at the turn of the 20th century, and in the realm of injury prevention. Today, the leading causes of death and disability are chronic diseases, especially diseases of the heart, cancer, and stroke. For most of these chronic diseases, however, there are no systematically developed frameworks for the application of law to preventive efforts. In the relatively few instances where the role of law has been fully applied to the prevention and control of chronic diseases and their risk factors (e.g., tobacco control and prevention), the observed impact and effectiveness demonstrate the public health benefits they offered.

The time has come for a full exploration of comprehensive legal frameworks for preventing and controlling the growing epidemics of obesity, heart disease, stroke, and other chronic diseases and their related major risk factors. These frameworks will be a crucial addition to the tools available to the public health workforce, especially state and local health department program managers as well as state and national policy makers. They also can assist program managers' interaction with city mayors, legislators, governors, and other policy makers. Their successful development, implementation, and continuing evaluation for effectiveness will require a broadly collaborative, multidisciplinary effort guided by both scientific and legal expertise. In an effort to expand the spectrum of effective public health interventions, the CDC will work with its partners to explore the development of these systematic legal frameworks as a tool for preventing chronic diseases and protecting and promoting the public's health.

In the second part of this paper, we provide an overview of pertinent U.S. jurisprudence, including current legal theories and methods, examine examples of legal frameworks in public health, and conclude by suggesting specific options for exploring the development of systematic legal frameworks for preventing chronic diseases.

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Tables

Table 1.
Core Elements of Public Health Legal Preparedness

Core Element	Selected Examples
Essential legal authorities	Authorization for disease reporting Interventions such as quarantine and smoking restrictions Health worker licensure and liability protection
Competency of public health professionals to apply those laws	Technical assistance to health departments Training and certification
Information on public health law best practices	Inventory of state and local public health laws and ordinances Assessment of the impact and effectiveness of existing public health laws
Coordination across jurisdictions and disciplines	Partner disciplines such as law enforcement and emergency medical services Federal and state judiciaries Private bar

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Table 2.
Selected Laws for the Prevention of Chronic Diseases and Injuries*

Law	Public Health Issue Addressed	Effectiveness [†]	How It Works
Smoking bans or restrictions	Exposure to environmental tobacco smoke	Strong evidence	Requires behavioral change to change the environment
Tobacco excise taxes	Tobacco initiation and use	Strong evidence	Incurs a financial disincentive to invoke behavior change
Required coverage of cessation services costs	Tobacco use	Sufficient evidence	Requires organizational change that promotes behavioral change
Zoning and land use requirements	Physical inactivity	Review in progress	Requires environmental change to facilitate behavioral change
Child safety seat use laws	Unintentional injuries of children	Strong evidence	Directly requires behavioral change
Safety belt use laws	Unintentional injuries of older children, adolescents, and adults	Strong evidence	Directly requires behavioral change
Blood alcohol concentration limit of 0.08% for operators of motor vehicles	Unintentional injuries of older children, adolescents, and adults	Strong evidence	Primarily provides powerful psychological deterrent to invoke behavioral change; also provides disincentive to invoke behavioral change through fines and other penalties
Sobriety checkpoints for motor vehicle operators	Unintentional injuries of older children, adolescents, and adults	Strong evidence	Provides psychological deterrent to invoke behavioral change
Fluoridation of community water supplies	Dental caries	Strong evidence	Directly changes the physical environment requiring no action on the part of the target population
Food fortification	Nutritional deficiencies	Strong evidence	Directly changes the physical environment requiring no action on the part of the target population

* Laws used to denote restrictions, bans, regulations, ordinances, or public policies, as well as legislation.

[†]As determined and defined in the Guide to Community Preventive Services (19) or, in the case of food fortification, by Honein et al (20).