Policy Surveillance: A Vital Public Health Practice Comes of Age

Scott Burris
Temple University

Laura Hitchcock
Public Health—Seattle & King County

Jennifer Ibrahim
Temple University

Matthew Penn
Tara Ramanathan
Centers for Disease Control and Prevention

Abstract Governments use statutes, regulations, and policies, often in innovative ways, to promote health and safety. Organizations outside government, from private schools to major corporations, create rules on matters as diverse as tobacco use and paid sick leave. Very little of this activity is systematically tracked. Even as the rest of the health system is working to build, share, and use a wide range of health and social data, legal information largely remains trapped in text files and pdfs, excluded from the universe of usable data. This article makes the case for the practice of policy surveillance to help end the anomalous treatment of law in public health research and practice. Policy surveillance is the systematic, scientific collection and analysis of laws of public health significance. It meets several important needs. Scientific collection and coding of important laws and policies creates data suitable for use in rigorous evaluation studies. Policy surveillance addresses the chronic lack of readily accessible, nonpartisan information about status and trends in health legislation and policy. It provides the opportunity to build policy capacity in the public health workforce. We trace its emergence over the past fifty years, show its value, and identify major challenges ahead.

Keywords evidence-based policy, translation, public health law research, big data, transdisciplinary public health law, legal epidemiology

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Law and policy are primary tools of health promotion and protection (Burris and Anderson 2013). Because states, localities, and public and private institutions are all important health regulators, US public health policy is a complicated patchwork of diverse approaches. Governments at all levels use statutes, regulations, and policies, often in innovative ways, to make communities healthier and safer (Frieden 2013). Organizations outside government, from private schools to major corporations, create work- and facilities-rules on matters as diverse as tobacco use and paid sick leave.[1] Though widely used, legal "treatments" are too often applied to large populations without timely evaluation or even systematic monitoring. When we implement programmatic interventions in health, we demand evaluation. We should demand no less for legal interventions.

Law should also be better integrated in the data collection infrastructure of public health and public information. As public health works toward integrated data systems in a culture characterized by the democratization of data, law lags noticeably behind. Health information is increasingly created in electronic records, capable of harmonization and shared use. We take for granted the capacity to merge health with demographic or economic data. Yet, for the most part, legal information remains trapped in text files and pdfs, and as such is excluded from the universe of usable data. In public health generally, we aspire for data to drive programming, investment, and implementation. This is as important for law as any other mode of public health action.

In this article, we set out the case for the practice of policy surveillance to help end the anomalous treatment of law in public health research and practice. Policy surveillance is the ongoing systematic, scientific collection and analysis of laws of public health significance. We trace its emergence in the United States over the past fifty years, make the case for its value, and identify major challenges ahead.

The Emergence of Policy Surveillance

Implementing effective legal interventions entails timely evaluation to learn what works, and the translation of evidence into action through the rapid

1. The Centers for Disease Control and Prevention (CDC) defines "policy" as "a law, regulation, procedure, administrative action, incentive, or voluntary practice of governments and other institutions" (Office of the Associate Director for Policy 2015). The practice of policy surveillance we describe here is intended to capture policies that are set out in explicit form as laws, regulations, or rules, and standards or other measurable forms of regulatory expression. For simplicity, we will generally use "law" to refer to "law and policy" in the rest of this article.

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diffusion of successful models. Both of these start with simply knowing which policy-making entities are doing what through "mapping studies" that capture the content and variation of policies across jurisdictions or institutions (Burris et al. 2010). Over the past fifty years, two distinct approaches to mapping research have been prevalent. The first uses traditional methods of legal research and analysis as practiced within the legal profession. Such legal mapping studies assessing state and local health laws go back at least seventy-five years in the health literature (Fowler 1941), and have become common in the past thirty years, covering a wide range of topics. Studies of "infrastructural health law" (defining the basic powers, duties, and limitations of health agencies at the state and local level) have appeared regularly (Centers for Disease Control and Prevention 1994; Enterline et al. 1984; Fowler 1941; Gostin et al. 1996, Greve 1953; Hein and Bauer 1964; Moldenhauer and Greve 1953). Even more common have been assessments capturing the nature of and variation in laws directly addressing specific health problems, including such important interventions as access to contraceptives (Merz, Jackson, and Klerman 1995; Warren 1964), smoking and tobacco control (Choi, Novotny, and Thimis 1992; Shelton et al. 1995), syringe exchange (Burris et al. 1996; Burris et al. 2002), tuberculosis control (Gostin 1993), and expedited partner therapy for sexually transmitted infections (Hodge et al. 2008). The Internet has provided a dissemination route beyond publication, and now hosts thousands of webpages offering multi-jurisdictional legal information, often of uncertain provenance and validity (Presley and Burris 2014b; Presley and Burris, forthcoming).

Primary legal research is sometimes supplemented with surveys and the examination of organizational websites in order to collect information on laws, regulations, and organizational policies (Abdulloeva and Eyler 2013; Carlson, Lehman, and Armstrong 2012; Lindley et al. 2011). Although these cross-sectional assessments are typically conducted with the aim of informing an audience of public health practitioners and policy makers about the current state of the law or important institutional policies, they are not always carried out by lawyers. In a recent scan of CDC-authored mapping studies published between 2011 and 2015, only seven of the fifteen studies listing author credentials included lawyers on the research team (Martini et al., forthcoming). While lawyers are not always essential for quality policy surveillance work, the expertise they bring to the reading of complex statutes and regulations—and to legal research and analysis as conducted within the legal profession—is usually desirable.

Meanwhile, another approach to mapping public health law evolved in evaluation research, driven by the need to transform the text of law into scientifically valid, quantitative data for analysis. The need to measure the effects of large-scale policy experiments, such as raising the drinking age, led to new methods for the scientific measurement of law as a variable (LaFond et al. 2000). The Alcohol Policy Information System (APIS), which launched its public website in 2003, was a milestone in the development of scientific legal datasets tracking variation and change in state law for both researchers and the wider policy audience (Hilton 2013). The CDC's State Tobacco Activities Tracking and Evaluation (STATE) System exemplifies the learning process associated with capturing legal data. The STATE System was initiated even before APIS, to support both research and public awareness on state tobacco policy (Centers for Disease Control and Prevention 2015; Marynak et al. 2014). When it was originally released in 1999, its legal data were largely dichotomous or categorical and relatively superficial; a 2004 update captured specific provisions of state laws and provided downloadable data in .csv files. A hallmark of both APIS and the STATE System was a concern for building longitudinal data with consistent, transparent, and reproducible methods (Hilton 2013; LaFond et al. 2000). As with traditional fifty-state surveys, scientific legal datasets have become far easier to access because of the Internet.

Creating Twenty-First-Century Policy Surveillance

Harmonization of these two professional approaches has been one result of new institutional investments in scientific public health law. In 2009 the Robert Wood Johnson Foundation (RWJF) funded the Public Health Law Research (PHLR) Program to build a distinct identity for the scientific study of the impact of law and legal practices on public health. In a 2010 article outlining a framework for public health law research, Burris et al. characterized scientific legal mapping studies as following transparent and reproducible methods. Such studies would be based on "a systematic review protocol [that] specifies a definition of the type of law being investigated, perhaps with explicit inclusion and exclusion criteria; a search methodology that acknowledges the strengths and weaknesses of extant databases; and a coding scheme identifying the main features of the laws, such as the population covered and enforcement mechanisms" (Burris et al. 2010: 182). As part of its support for research, PHLR commissioned experts to describe best practices for scientific collection and

coding of statutes (Tremper, Thomas, and Wagenaar 2010), and funded the use of these methods in creating data for use in evaluation research on topics including distracted driving (Ibrahim et al. 2011), youth sports concussions (Harvey 2013), and opioid overdose prevention (Davis, Webb, and Burris 2013). This work, in turn, led PHLR to develop a software system, LawAtlas, for creating and publishing legal datasets. Researchers using LawAtlas have created datasets mapping more than forty-five health law topics, including state occupational health and safety laws, emergency mental health hold laws, local park and school tobacco policies, fracking rules, and health care worker scope of practice (Public Health Law Research Program 2015). The MonQcle, a software platform based on the original LawAtlas concept but designed for large-scale use in tracking laws at the local, provincial, and national level throughout the world, was released in 2016 (Legal Science, LLC 2015a). An RWJF-funded Policy Surveillance Program at Temple University provides technical assistance for health policy surveillance projects and free access to the MonQcle.

The idea that laws important to health should be measured and tracked over time derives from one of the essential public health services: surveillance. Surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data and the use of that data to plan for immediate public health action, program planning, and evaluation (Buehler 2008). A logical extension of this practice to the law is "policy surveillance," the "ongoing, systematic collection, analysis, interpretation and dissemination of information about a given body of public health law and policy" (Chriqui, O'Connor, and Chaloupka 2011: 21). In 2011 an Institute of Medicine committee emphasized that "evidence based evaluation and governance is key to understanding what works, to bring data and facts to a domain populated by opinions and politics, and to implement policies that are successful and efficient" (Institute of Medicine 2011: 104). The committee suggested that the US Centers for Disease Control and Prevention undertake a pilot project to develop a system to track laws and policies that influence the health of populations, which could serve to provide basic data for evaluation while informing practitioners, the public, and policy makers of important legal developments (Institute of Medicine 2011). The IOM report was the first time national health policy experts had recommended a comprehensive, cross-cutting health policy monitoring system.

The CDC's investment in public health law has been crucial in pursuing this recommendation. The CDC's Public Health Law Program (PHLP) was

established in 2000 (Goodman et al. 2006). In 2011 PHLP joined the Office for State, Tribal, Local and Territorial Support (OSTLTS) expressly to further the use of comparative evidence and best practices between jurisdictions and centralize the use and understanding of law, legal tools, and legal research methods for the CDC and its public health partners in the field. Since then, PHLP has championed the use of scientific methods for legal research, including in resources on electronic health information (Ramanathan, Hoss, and Penn, forthcoming), prescription drug abuse (Menon 2015), and state coroner/medical examiner systems (Caucci 2015). Recognizing that health agencies at all levels of government have used evidence from both legal mapping and legal evaluation studies to promote public health programs and activities, PHLP's role within the CDC has grown to promote a scientific approach to legal research and evaluation (Goodman et al. 2006; Moulton et al. 2009). As a major proponent of public health research innovation, the CDC has provided technical assistance and carried out methods work designed to support systematic policy surveillance. The work began with setting out a scientific approach to collecting and coding legal data for quantitative evaluation research (Ramanathan, Hoss, and Penn, forthcoming). The CDC went on to support projects to convene expert panels that defined criteria for selecting policies for surveillance (Presley and Burris 2014a), technical standards for conducting surveillance (Public Health Law Research 2014), and competencies for the practice of policy surveillance (Presley et al. 2015).

Table 1 summarizes the coverage of six policy surveillance resources. These were identified in a 2014 scan as the only regularly updated US health policy surveillance portals that provided data for download (Presley and Burris 2014b). Though broadly similar, these resources are diverse in methods, information management systems, and missions. Americans for Nonsmokers' Rights (ANR), LawAtlas, and APIS have, as a primary purpose, the creation and publication of policy data for evaluation and other scientific research purposes. The ANR site, however, keeps its data behind a pay wall, while APIS and LawAtlas provide detailed information on variables and the research process. The CDC's STATE methods page links users to the entities that originally produced the data, which may or may not provide detailed methods information. All of these resources are designed to make policy information publicly accessible, but they differ in the kinds of access offered. The ANR site provides visitors with access to pdf summaries; all of the others offer web visitors some opportunity to customize queries and reports. The APIS and LawAtlas sites offer longitudinal data

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Table 1 Health Policy Surveillance Resources Providing Downloadable Data

Resource	Website	Topics Covered	Period Covered
Alcohol Policy Information System (APIS)	http://alcoholpolicy.niaaa.nih.gov/	Laws related to all aspects of alcohol regulation, including taxes on all types of alcoholic beverages, sales restrictions, insurance exclusions for intoxication, BAC limits, and retail/wholesale distribution systems requirements.	1/1/1998 to 1/1/2014
Classification of Laws Associated with School Students (CLASS)	http://class.cancer.gov/profiles.aspx	Laws associated with school students on topics including school meal standards, vending machine requirements, physical education curricula and time requirements, and joint-use agreements between communities and schools for school facilities.	2003 to 2012
LawAtlas	www.lawatlas.org	State and local public health laws on topics including prescription drug overdose prevention, oil and gas drilling, medical professional scope of practice, medical marijuana, occupational health and safety, distracted driving, and civil commitment.	Includes a mix of cross-sectional and historical legal data, with updating dependent on topic area

(*continued*)

Table 1 Health Policy Surveillance Resources Providing Downloadable Data (*continued*)

Resource	Website	Topics Covered	Period Covered
State Tobacco Activities Tracking & Evaluation (STATE) System	http://www.cdc.gov/statesystem/	Laws related to tobacco regulation, including smoke-free indoor air laws, excise taxes on tobacco products, youth access to tobacco, and state preemptions of local tobacco laws.	12/1/2012 to 9/30/2015
Americans for Nonsmokers' Rights (ANR) Smoke-free Lists, Maps, and Data	http://www.no-smoke.org/goingsmokefree.php?id=519	State and local tobacco control laws, including smoke-free laws, advertising and permits for tobacco sales, e-cigarette use, and state preemption of local tobacco laws. Also, smoke-free rules at public facilities, such as stadiums and airports.	Early 1980s to 10/2/2015
Guttmacher Institute	http://www.guttmacher.org/datacenter/	Reproductive health laws including abortion counseling and waiting periods, minors' access to abortion, restrictions on funding and insurance for abortion, sexually transmitted infection services, emergency and non-emergency contraception, sex education, and Medicaid coverage of family planning services.	Current policies as of 12/1/2015

Table data valid through December 1, 2015.

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and allow users to see trends over time. The Guttmacher Institute offers interaction with current law. The National Cancer Institute's Classification of Laws Associated with School Students (CLASS) organizes its data within a normative classification system that scores states on the content of their laws. The scan identified more than 150 other websites and pages providing fifty-state information about laws of health significance, most of which were one-time, cross-sectional efforts that did not provide access to data for download.

The Case for Policy Surveillance as a Core Public Health Function

Developing and adopting shared policy surveillance standards, methods, and tools would address at least three needs in public health research, practice, and policy making. First, scientific collection and coding of important laws and policies creates data suitable for use in rigorous evaluation studies. Since its launch, more than 140 peer-reviewed papers have drawn on APIS for reliable legal data (*Peer-Reviewed Publications Using APIS Data* 2016). The diffusion and adoption of rigorous, transparent, and reproducible methods of collecting and coding legal texts means that more legal research will meet scientific standards of quality. Coding the text of the law or policy for important attributes supports more nuanced analysis and evaluation than simple observation of whether a law on a certain topic exists or not. Detailed policy surveillance coding schemes can facilitate the creation of summary policy measures for evaluation (Wakefield and Chaloupka 1998). Surveillance datasets can be created in longitudinal form, or naturally evolve into longitudinal data through ongoing monitoring and updating in which successive versions of the law are added to the database rather than replacing existing information. The use of written research and coding protocols enhances the accuracy and efficiency of updating. Longitudinal policy data supports quasi-experimental and other more rigorous observational designs that afford greater confidence in causal inference than cross-sectional studies capturing only one point in policy time (Wagenaar and Komro 2013). Because the important attributes of legal texts are objectively and reliably measurable, overall efficiency in health research is served by having important laws collected and coded once, rather than repeatedly by different teams studying the same laws. Propagation of public-domain legal datasets will lower the cost and potentially speed the conduct of research evaluating important policies.

Second, policy surveillance addresses the chronic lack of readily accessible, nonpartisan information about status and trends in health legislation and policy. Local policy information is particularly difficult to collect because there are so many localities and local bodies with policy-making authority and because many forms of local policy are not available in general legal databases. Even state laws and regulations, which are accessible to people with legal training, can be difficult and costly for others to obtain or analyze. Although a considerable amount of legal mapping is performed and posted on the Internet, very few sites provide trend information or access to legal text that has already been analyzed and categorized for a general audience. Policy surveillance that highlights important issues or categories, breaks legal texts into component variables, takes advantage of data-visualization tools, and provides full text or links to text, can make it much simpler for public health stakeholders to find and understand existing laws and policies.

Accessible legal trend data is important to the accountability of the public health system, because laws and policies are frequently used as measures of progress, or defined as goals in themselves in health policy guidance like the *Guide to Community Preventive Services* and *Healthy People 2020*. If a government agency recommends the adoption of a law, or even just endorses it as evidence-based, those who make the recommendation, policy makers, and the public should be able to see where such legislation already exists, where it is still needed, and whether the recommendation is being followed. For example, when *Healthy People 2020* recommends the adoption of bike helmet laws, we should all be able to quickly determine which states or cities have adopted them, what those laws look like, and how fast we are progressing to the stated 2020 goal of having such laws in 27 states and the District of Columbia. A review of major sources of federal health policy advice found that such information is not consistently provided (Presley and Burris 2014c). The lack of policy adoption information is even more acute in global health policy, though, as Box 1 describes, this is beginning to change.

Box 1 International Dimensions

Investment in health law capacity generally, including policy surveillance, is relatively low in global health institutions, but there are bright spots that demonstrate the good work that could be done. The WORLD Policy Analysis Center at UCLA uses scientific research methods to create data and monitor policies at the national level, including key human rights provisions, and regularly publishes detailed analyses (Cassola et al. 2014; Cassola, Raub, and Heymann 2016; Heymann et al. 2013; Heymann, McNeill, and Raub 2014). The International Labor Organization maintains an exhaustive compendium of labor legislation, some of it downloadable (www.ilo.org). The Campaign for Tobacco-Free Kids tracks tobacco control legislation and litigation (www.tobaccocontrollaws.org/). The WHO's road safety program collects legal information from 180 countries and produces a biennial report (Toroyan 2015).

The benefits of policy surveillance may, if anything, be greater on the global level. Simple access to legal information is a challenge for many countries of the world, while the need for effective health policy interventions and infrastructure at the national and subnational levels is even greater than in the United States. The WHO's International Digest of Health Legislation, an effort to share the "important laws [and] regulations . . . pertaining to health" that member states are required to report to WHO under Article 63 of its constitution, is moribund (quoted in Attaran et al. 2012: 284). The 2014–15 Ebola outbreak was only the most recent instance in which greater attention to and support for effective national legal capacity could have been useful (Marks-Sultan 2016). Policy surveillance can provide better access to legal information in a more actionable form, bring more attention to issues of implementation/enforcement, and support evaluation and reform (Heymann et al. 2012).

Accessible legal data can inform policy making in other important ways. All participants in the process of translating knowledge and evidence into laws and regulations—researchers, health professionals, community members, policy makers—benefit from knowing where the need (and onus) for acting lies, what the trends are, how jurisdictions compare in individual policies and their overall policy portfolios, and what forms current policies are taking. Policy surveillance facilitates diffusion of

innovation as jurisdictions seeking to address a particular public health issue may use surveillance data to learn what others are doing. Detailed coding of the attributes of policies makes it far easier to identify important differences in policies across jurisdictions, differences that become extremely important as evidence from the evaluation of varying policy models and components emerges.

A third important benefit of policy surveillance is the opportunity to build policy capacity in the public health workforce. Legal competencies for the public health workforce are nearing completion. Public Health Accreditation Board (PHAB) standards for accreditation recognize that "public health laws are key tools for health departments as they work to promote and protect the health of the population," and should be evidence-based and current with knowledge, practices, and emerging issues in public health (Public Health Accreditation Board 2013: 156). In order to meet PHAB standards, health departments must have the capacity to review laws, assess them for recommended changes, and collaborate with appropriate entities to effect needed reforms (Public Health Accreditation Board 2013). A competency model is currently being developed to teach policy surveillance methods that ensure transparency, replicability, and the production of quality legal data to a wide range of public health professionals with varying goals and resources. Policy surveillance work gives health practitioners the opportunity to identify, define the key elements of, and then code and share policies, and may in fact be an introduction to developing competency in interpreting legal information. Developing a local policy surveillance project (defining key elements of the law to monitor), for example, requires detailed discussion of the policy evidence base (or lack thereof), potential policy elements that impact implementation and enforcement, typical statutory or policy structure, definitions, and the overall legal context (e.g., state and federal mandates, preemption, and local or other policy maker's authority). Local policy surveillance studies, if published, can then also make policy language and comparative analysis more accessible for day-to-day use (Ibrahim 2015) by governments and communities, a form of data democratization. Particularly for departments covering multiple governmental subdivisions (cities, school districts, special purpose governments) and institutions, where authority to effect change lies outside of the health department's direct authority, surveillance and collaboration support a policy assurance role not formerly possible, as illustrated by the experience of Seattle-King County (see Box 2).

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Box 2 Policy Surveillance at a Local Health Department

The experience of Public Health—Seattle & King County (PHSKC), an early local government adopter of policy surveillance, illustrates many of the uses described in this paper. PHSKC catalogued local tobacco policies in its LawAtlas Policy Tracker system (www.kingcounty.gov/healthservices/health/data/PolicyTracker.aspx) to capture institutional and governmental policies. PHSKC examined tobacco-related policies for thirty-nine cities' parks, thirty-one higher-education institutions, and nineteen school districts. Analysis of policy change over time demonstrated successful work by the agency and others to increase the number of cities with tobacco-free parks policies from five in 2010 to fourteen in 2013. The mapping, however, also revealed previously unnoticed differences in coverage across the county: fewer tobacco-free or even tobacco-limited policies were in place in parks in cities with higher smoking rates among adults and youth, a regional health equity concern. The surveillance system also found that while all nineteen school districts in King County follow minimum state law requirements for tobacco policies, almost 30 percent of the districts had not explicitly prohibited electronic smoking devices, despite emerging evidence of increased use by youth. In addition, districts varied in the sanctions for violation of a tobacco policy, specificity of prohibited places, and the way that "alternatives to suspension" were stipulated in policy (which related to a model of attempting to 'treat' tobacco use, rather than punish it). All of these findings suggested targets for policy improvement. Creation of the system, training of staff, frequent dissemination, and planned datasets for healthy planning (comprehensive plans' provisions for active transportation, such as bicycling and pedestrian uses), and healthy housing (looking at city code property maintenance requirements, including abatement of hazards such as mold, and lead and tobacco prohibitions) are expected to allow the health department to monitor and respond to not only key health conditions, but also their specific policy drivers. Future research can also include dose-response to multiple policies' coverage, where a web of policies may be needed to protect population health.

Future Directions and Challenges

Scientific methods and better technology have made it feasible to collect and publish legal data in a timely way. At reasonable cost and largely with existing resources, policies of significance can be tracked, datasets can be made available to researchers, and tracking information can be published to websites. The same tools can be used to support other legal mapping work not intended to create scientific data, like one-time legal assessments (sometimes called fifty-state surveys) and policy compilations designed for non-lawyers, such as the health law profile the state of Nebraska has developed on LawAtlas (Ibrahim 2015). It may even be possible to use these methods and tools to allow state and local health officials to fulfill accreditation requirements and advance cross-sector collaboration in Health in All Policies models.

If all that we have described has made the case for policy surveillance, the remaining question is what stands in the way of making policy surveillance a part of standard public health practice. We see three main challenges: culture, cost, and coordination. The "culture" problem arises, in different ways, in both law and public health. Policy surveillance reflects a "transdisciplinary" model of public health law in which tools, methods, and professional values of law, scientific research, and public health practice are integrated and valued across disciplinary boundaries (Burris et al. 2016). Policy surveillance requires lawyers to apply scientific methods and appreciate scientific values in legal research, and, more broadly, to appreciate the importance of data, monitoring, and evaluation to effective public health law practice. Policy surveillance and the transdisciplinary model must also overcome the residual belief in pockets of public health research and practice that law is somehow different than other modes of intervention: unpalatable, unmeasurable, dangerously political, and the exclusive domain of lawyers and advocates. The best way to address this cultural challenge is to demonstrate that law can be comprehended within a scientific public health framework. Policy surveillance itself represents such a demonstration, and we are confident that this and other efforts are building a space for law "within" the culture of public health.

Building and maintaining a robust policy surveillance system will require investment in leadership and coordination, but not necessarily substantial new resources. Important health organizations are already investing in policy surveillance. The National Institute on Alcohol Abuse and Alcoholism funds APIS; the National Cancer Institute funds CLASS; and the National Institute on Drug Abuse has recently supported the development

of a Prescription Drug Abuse Policy System (Legal Science, LLC 2015b) and a Drug Abuse Policy Surveillance System. The CDC maintains the STATE System and other policy databases in areas like vaccines, and the PHLP is a major producer of mapping studies. On the foundation side, RWJF is currently supporting the wider use of policy surveillance through a program at Temple University, and the RWJF-supported Network for Public Health Law continues to lend staff to policy surveillance and rapid legal assessment projects. Together with RWJF, the CDC Foundation is supporting the Healthy People 2020 Law and Health Policy Project, intended to highlight important health policy goals. The de Beaumont Foundation is supporting a project to map the uptake of the ten most important public health laws in the nation's forty largest cities (Cityhealth 2016). Some surveillance data providers, notably ANR, are supported at least in part through fees charged to researchers for data access. The nearly fourteen hundred resources identified by Presley and colleagues (Presley and Burris, forthcoming) represent a significant investment in conducting and sharing legal research that could, with policy surveillance methods, provide much greater value.

Leadership and coordination are keys to building an efficient and effective network of policy surveillance practitioners and resources. The existing funding for legal research and policy surveillance comes from many silos in many organizations. A good deal of legal research is inefficient because it is either duplicative or conducted in a way that does not maximize its utility and accessibility. While there is not necessarily a need for a single source for surveillance data in the Internet age, there would be many advantages to actively networking new and existing portals. Aside from avoiding duplication, better coordination of policy surveillance providers could produce: common data standards to increase the sharing and wide use of data; more rapid development of new tools and methods; and easier consumer access to existing data. Shared methods, explicit protocols, and open-source data would allow researchers to update datasets that have not been maintained by their creators. If large numbers of states and cities begin to use policy surveillance tools and methods to monitor or inventory key health laws, a common coding system would allow ready comparison across jurisdictions. All these efficiencies focus attention on the bigger picture of legal data integration. The market and the currently dominant technologies for legal information are ripe for innovation, from drafting new laws to be machine readable through search methods to changing how legal results are visualized. Just as we can aspire to interoperable medical

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records, we can begin to work toward a day when major policy data hubs can "speak" to each other and through other data systems (Burris 2015).

Coordination is also needed among the funders of legal mapping, evaluation research, and evidence translation. Not all laws are worth monitoring or evaluating: like any other form of surveillance, selectivity is important for efficiency and utility. An expert panel convened by PHLR for the CDC's PHLP identified several criteria supporting surveillance of a particular law, including the significance of the health problem targeted by the law or policy, the extent to which the legal intervention is under active consideration by policy makers, the need for evaluation research, and whether the law is an identified national priority in a source like *Healthy People 2020* (Presley, Reinstein, and Burris 2015). If data, once created, are not used in evaluation or to support and monitor translation into practice, an important part of the value proposition is lost. While policy surveillance and portals for publishing policy surveillance data need not and probably should not be primarily maintained within government, state and federal agencies can play a strong leadership role in convening stakeholders and supporting the design and operation of a disseminated policy surveillance network.

The Cochrane and Campbell Collaborations provide a model that the growing community of policy surveillance practitioners might emulate. These collaborations consist of networks of researchers who write systematic reviews that meet specified standards of quality and are available in a central portal. The work of establishing standards, writing reviews, and peer reviewing is conducted largely by volunteers (i.e., professionals whose compensation is not coming from the Collaborations). Most of the direct cost of the enterprises is spent on the administrative hubs that support the network, maintain the content management systems, and disseminate the work (Starr et al. 2009). The Collaborations have had important support from funders, and this has been sustained because of the value they provide to a range of users. Importantly, however, these collaborations began with "grassroots" effort and depend on the continued commitment of researchers to the work (Petrosino 2013). Policy surveillance has many of the necessary ingredients. Along with a global group of dedicated practitioners, there are several excellent websites that demonstrate the feasibility of web publication of information and data, a growing library of methods and standards (Anderson et al. 2013; LaFond et al. 2000; Presley and Burris 2014a; Presley et al. 2015; Tremper, Thomas, and Wagenaar 2010), and at least one software content management system designed specifically for policy surveillance (Legal Science, LLC 2015a).

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Conclusion

Current methods and technologies for policy surveillance present opportunities within the reach of the public health community. There is a chance to drastically "up our game" in policy monitoring and evaluation, doing better work more efficiently. There is a chance to bring law and policy information into the public health datasphere, where it can be used in ways we have just begun to explore. Indeed, as leaders in public health point ever more urgently to social determinants of health (Plough 2015), better understanding of the many ways laws shape environments and behaviors is more crucial than ever (Burris, Kawachi, and Sarat 2002; Komro, Burris, and Wagenaar 2014). Seizing the opportunity still requires some hard changes in how lawyers and policy researchers collect and analyze policy data, in how major funders like the CDC and NIH allocate policy research funding, and in norms and expectations of what and how basic policy information is made available to the profession and the public; but never before have we had so clear an opportunity to transform public health law as we know it to address the public health problems of the twenty-first century.

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Scott Burris is a professor of law and public health at Temple University, where he directs the Robert Wood Johnson Foundation's policy surveillance program. Burris was the editor of the first systematic legal analysis of HIV, *AIDS and the Law: A Guide for the Public* (Yale University Press, 1987), and spent several years lawyering on behalf of people with HIV at the American Civil Liberties Union. Since joining the Temple faculty in 1991, his research has focused on how law influences public health and health behavior. He has served as a consultant on public health law with organizations ranging from the World Health Organization to the producers of the Oscar-winning film *Philadelphia*. Burris is a graduate of Washington University in St. Louis and the Yale Law School.

Laura Hitchcock is the staff lead for Public Health—Seattle & King County's legal epidemiology and policy surveillance program, as well as overseeing gun violence, child death review, and the county's response to legal recreational marijuana in Washington state. An attorney by training, she has over twenty years of experience in comparative law analysis domestically and internationally. She has been lead researcher on a Public Health Law Research mapping study on local city and county policies related to legal marijuana, and a Public Health Systems and Services Research study of local health department capacity to conduct violence and injury prevention programming, and is the recipient of an American Public Health Association policy innovation award. Through her leadership, the health department systematically monitors the policy environment in thirty-nine cities, nineteen school districts, and other local institutions that affect the public's health, with an orientation toward eliminating health disparities in the nation's tenth largest county.

Jennifer Ibrahim is a tenured associate professor in the Department of Health Services Administration and Policy, the associate dean for academic affairs for the College of Public Health, and the associate director of the National Program Office for Public Health Law Research at Temple University. Jennifer has been recognized by her peers as an outstanding teacher as evidenced by the awarding of all of Temple University's teaching awards, including the highest honor, the Great Teacher Award, and multiple national awards. In addition to her achievements in teaching and mentoring graduate students, she has maintained a funded research agenda in the area of health policy, including work on legal infrastructure, the dynamic relationship between public health lawyers and practitioners, and tobacco control policy making.

Matthew Penn is the director of the CDC Office for State, Tribal, Local and Territorial Support's Public Health Law Program (PHLP). The PHLP works toward a public health community that understands how the law impacts the public health system and the public's health. In his role as PHLP director, he leads a team of legal analysts responsible for the agency's efforts to support the use of law as a public health tool at the state, tribal, local, and territorial levels. Prior to entering federal service he was a staff attorney serving South Carolina's Department of Health and Environmental Control for nine years as an adviser in the areas of public health practice, emergency preparedness, and environmental health. He received his law degree with honors from the University of South Carolina. He began his legal career with the South Carolina Supreme Court in the Staff Attorney's Office and the University of South Carolina's Office of General Counsel.

Tara Ramanathan serves as a public health analyst and staff attorney with the CDC's Public Health Law Program, where she specializes in state and local government law related to emerging public health issues. She leads the program's research initiative to promote the use of legal epidemiology in the field. She has published and spoken extensively on the use of law to address healthcare quality, health system transformation, and health information technology. Most recently, she participated in the Ebola response as a policy advisor in the Atlanta Emergency Operations Center and as a CDC advisor to USAID in Guinea. Ms. Ramanathan received her JD from Emory University School of Law, MPH from the Johns Hopkins Bloomberg School of Public Health, and BA from Wellesley College. She began her government service as a Peace Corps volunteer supporting rural health programs and community development in Senegal.

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