Policy Tracking in a Pandemic: Lessons Learned

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SUMMARY. The COVID-19 pandemic gave rise to an extraordinarily high volume of legal activity in the United States. In addition to federal travel bans and economic stimulus legislation, states and localities enacted a variety of mitigation measures to combat the spread of COVID-19, including stay-at-home orders, business and school closures, and face mask requirements. Monitoring the state of the law in real time provides information about how government is responding to the pandemic and what rules currently apply. While the prompt documentation of policy change through conventional legal research is critical to the situational awareness of policy makers and the public, not all policy tracking creates the rigorous and reliable legal data required for research. Empirical legal data enables evaluations of the direct effects and side effects of legal measures on health and health equity. Now more than ever, law must be a primary target for health research. This Chapter describes the methods used to create credible data for evaluation research, discusses policy tracking efforts during the COVID-19 pandemic, and closes with reflections and recommendations for supporting scientific legal tracking in the future.

Introduction
The U.S. legal response to COVID-19 has been unprecedented in the volume, speed, and variety of measures deployed. While the federal government issued international travel controls and some policy guidance, most legal action took place at state and local levels. In March 2020 and April 2020, state and local governments began to issue and update emergency orders at a furious pace. By July 1, 2020, state governments issued more than 1,000 legal measures, including mandatory stay-at-home orders, gathering bans, business and school closures, and face mask requirements. See Chapter 1 in Assessing Legal Responses to COVID-19: Volume I for a detailed chronology of the federal, state, and local response. As reported in that Chapter, restrictions were relaxed, and the partial reopening of businesses began even as a second wave of COVID-19 cases surged nationally to a peak on July 24, 2020. The third and deadliest wave began in late October 2020 and persisted through the winter, prompting states and localities to postpone reopening plans and impose new restrictions. In January 2021, the Biden administration issued numerous executive actions to strengthen the federal COVID-19 response, including a mask mandate for federal property and all forms of public transportation, an executive order directing government agencies to facilitate the gathering, sharing, and publication of COVID-19 related data, as well as the establishment of the federal COVID-19 health equity task force. By February 15, 2021, the Centers for Disease Control and Prevention reported 485,164 deaths attributable to COVID-19 (CDC COVID Data Tracker, 2021).

As law emerged as the primary non-pharmaceutical “treatment” for COVID-19 prevention and control, questions about its necessity, effectiveness, and costs have been at the center of response efforts and pandemic politics. Researchers have been investigating these questions from the earliest days of the pandemic, drawing on many kinds of behavioral and health outcome data, from data tracking individual- and community-level mobility, to mortality records. However, the starting point for any evaluation of legal interventions is data accurately capturing the key features of the law being assessed. Key features that are essential for legal measurement include the people and places the law regulates, the specific behavior required, allowed, or forbidden, and the exact date the law went into effect. While many organizations jumped to compile and publish daily news of legal developments, which satisfied the needs of policy makers, the press, and the public, most of these resources did not provide the precise legal data required for evaluation research. This Chapter discusses law as a primary target for health research, describes the methods required to create data reliable enough for rigorous evaluation research, highlights various resources tracking COVID-19 mitigation measures, and concludes with reflections on the need for further investment in scientific legal mapping.

Law as a Primary Intervention in Health Research
With law central to the pandemic response, there was immediate interest in research that could assess initial efforts, like the Wuhan, China, lockdown and early border restrictions. There was even more interest in predictive modeling that used early infection
and movement data (and educated assumptions) to predict the course of the pandemic given various legal measures. As time passed, there was increased opportunity to use actual, rather than predicted, values to evaluate the impact of legal interventions on health outcomes. As more jurisdictions passed different legal interventions at different times, the potential for using strong quasi-experimental methods grew. Quasi-experimental designs require robust legal data that is granular (capturing key features of the law that are essential for legal measurement) and longitudinal (capturing the law in each jurisdiction as it changes over time).

The need for robust legal data was evident in preliminary legal evaluation studies that assessed the impact of the timing and/or presence of legal interventions on the virus’ spread by evaluating legal responses at the national and state level (Flaxman et al., 2020; Lurie et al., 2020). These preliminary studies relied on legal information from a variety of sources including news stories, press conferences, and government websites. Relying on legal information from these sources, as opposed to legal data created for research, can introduce inaccuracies and inconsistencies in the data, especially when it comes to collecting the effective date of a particular legal measure for longitudinal analysis. Inaccurately or inconsistently capturing the date of an intervention — even if the difference is a few days — can have a meaningful impact on the results, especially given the inordinate frequency of legal measures issued during the pandemic. Further, news stories and press releases often summarize the law, obscuring meaningful nuance within the legal text that is necessary for measurement. Granular features of the law, such as the type of school regulated (e.g., some countries kept elementary schools and preschools open while closing high schools and universities), or the precise size of a gathering ban (e.g., 50 people or 500 people) were not included or were miscategorized in these preliminary studies (Flaxman et al., 2020; Soltesz et al., 2020). Solely relying on information created for general public consumption, as opposed to legal data created for research, can lead to mismeasurement of the law, creating internal validity issues and skewing study results.

The methods used to create legal data for research have gained traction and attention in recent years, as the scientific legal mapping technique of policy surveillance has become a well-defined practice within the growing field of legal epidemiology (Burris, 2017; Horwitz et al., 2020; Kavanagh et al., 2020; Tremper et al., 2020). Policy surveillance — the systematic, scientific collection and analysis of laws of public health significance — tracks key features of laws across jurisdictions and over time, converting the text of the law into numerical data through an iterative process that emphasizes the importance of quality control (Burris et al., 2016). Use of rigorous quality control measures helps ensure accuracy of legal data. Further, good research builds quality and credibility through transparency. Therefore, legal data resources should be accompanied by a clear description of the scope, research methodology, coding rules used to create the data, and a detailed record of quality control measures. Ultimately, the policy surveillance process ensures reliability, replicability, and transparency in creating legal data for health outcomes research (see Figure 1.1).

Although the development of legal data through scientific legal mapping methods has become increasingly efficient due to well-honed methods and the reliance on innovative technology, tracking COVID-19 mitigation measures presents unprecedented challenges. These challenges include the volume of orders and the speed at which they have been issued and amended. In addition, many government websites did not publish historical orders (as they were habitually overwritten or removed) and current orders were often only accessible in PDF format, making the law difficult and time-consuming to collect. Further, with the variety of regulations during an evolving pandemic, the key legal variables changed rapidly, making it particularly difficult to track them consistently. Despite these challenges, many organizations began to track legal activity related to the pandemic in March 2020.

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**Figure 1.1: Core Tenets of the Policy Surveillance Process.**

**Reliability**
- Transforms the text of the law into structured quantitative legal data that can be used for modeling or evaluation
- Uses rigorous quality control measures, including redundant research and coding, to ensure validity and reliability

**Replicability**
- Details search terms, databases used, inclusion and exclusion criteria, and coding scheme decisions in a research protocol
- Emphasizes shared science through open-source data and the accompanying research protocol, allowing external researchers to update or expand upon the study

**Transparency**
- Details underlying methods used to create the dataset, including quality control measures in a research protocol
- Provides access to the full legal text (current and historical) with accompanying legal citations
Policy Tracking in a Pandemic

The rapid speed and ubiquitous nature of COVID-19 measures commanded significant interest in policy tracking from organizations around the world, resulting in many modes of tracking by diverse stakeholders. Universities, academic research institutions, news outlets, and advocacy organizations have compiled and published resources tracking emergency declarations, mitigation policies, and other topic-specific legal interventions in response to COVID-19 at various jurisdictional levels since March 2020.

The content, structure, and utility of COVID-19 policy tracking resources varies tremendously (see the sample of resources in Table 1.1). Policy tracking resources can focus comprehensively on multiple legal measures related to COVID-19, or on policies within a specific area of law and/or a specific population, including areas of law that disproportionately affect Black, Indigenous, and people of color (e.g., mandatory school closures, the regulation of correctional facilities, and paid sick leave laws). Though all of the resources in Table 1.1 provide useful information for policy makers, the press, and the public, not every tracker provided structured legal data, and the accompanying information necessary for researchers conducting evaluations (Center for Public Health Law Research, 2020).

Table 1.1 highlights some of the most important features for facilitating the use of legal data to evaluate law as a primary intervention when conducting health outcomes research.

**Jurisdictions.** Law and policy can vary tremendously from jurisdiction to jurisdiction, creating natural experiments across continents, across the United States, and across localities within a state. Identifying the jurisdictions selected for measurement is necessary since the location that is being regulated is an identifying feature of the law itself. All of the policy resources in Table 1.1 clearly noted the jurisdictions selected for measurement.

### Table 1.1: Sample of resources tracking COVID-19 law and policy measures.

<table>
<thead>
<tr>
<th>Resource</th>
<th>Jurisdictions</th>
<th>Effective Dates</th>
<th>Structured Data for Download</th>
<th>Links to Legal Text</th>
<th>Transparent Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston University COVID-19 U.S. State Policy Database</td>
<td>U.S. states</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Broadstreet COVID-19 Data Project</td>
<td>U.S. states and select cities and counties</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Kaiser Family Foundation State COVID-19 Data and Policy Actions</td>
<td>U.S. states</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Association of Counties County Explorer</td>
<td>Over 800 U.S. counties</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New York Times Coronavirus Restrictions</td>
<td>U.S. states</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Effective Dates. To understand the influence of a particular law on health, a researcher must collect the correct effective date — the date the policy officially went into effect and became enforceable. This allows for an accurate comparison between policies and health outcomes that may change over time. Some resources published a date associated with the measures they tracked; however, it was not always clear whether that date represented the date the measure became effective, the date the policy was announced in a press conference, or the date the order was issued. A research dataset should also contain the date the law ceased to be effective by virtue of repeal, amendment, or a sunset provision (or for current law, the date of the most recent observation verifying the data).

Structured Data for Download. Research use of data is greatly facilitated when laws are translated from unstructured, written text into structured numerical data. Structured, downloadable data equips researchers with quantitative legal data that can be easily merged with health outcome data using classical statistical software packages. Structured data can be cross-sectional (capturing the law at one point in time), or longitudinal (capturing the state of the law over a period of time).

Access to longitudinal data is important because it allows researchers to evaluate the effects of changes to laws and policies. Many resources did not comprehensively capture COVID-19 actions longitudinally and instead only provided the link to current COVID-19 measures, often overwriting older actions that were previously available. Several resources also shared their legal data through Github, which allows for the open-source sharing of information with version control to organize any prospective updates to the data in the future.

Links to Legal Text. Providing access to the underlying legal text used to create the reported data ensures transparency. Most COVID-19 policy trackers provided citations and direct links to the original written policies themselves. This allows researchers to go directly to the source to verify the findings. In fact, most resources included disclaimers encouraging data users to check the policy sources themselves.

Transparent Methods. Resources publishing data for research should be accompanied by detailed methods explanations describing how the data were compiled and manipulated, including coding decisions and discussion of quality control steps. Most resources provided an overview of the process used to collect the data, but very few actually defined coding decisions for specific variables. This lack of transparency and detail can lead to errors in measurement and incorrect conclusions in evaluation studies, as described above.

COVID-19 policy tracking resources serve different audiences with different needs. Aside from the sample included in Table 1.1, many resources did not include effective dates, structured data for download, comprehensive longitudinal data, or methods details. Without these key features essential for scientific legal measurement, the underlying information provided within these resources is not suitable for evaluation research. As described above, quasi-experimental evaluations of law call for longitudinal legal data, with great attention paid to the accuracy of the effective dates of the interventions, along with specificity and granularity when assessing the legal measures.

Reflections on Supporting Scientific Legal Mapping for Health Research

Scientific legal mapping techniques, like policy surveillance, were developed to create legal data suitable for empirical evaluation. The widespread use of these techniques requires core support in its infrastructure and funding. Infrastructure is not only created and sustained through guiding principles, texts, and methods literature, but also through the training and maintenance of a dedicated workforce. Ensuring that researchers who conduct scientific legal mapping are properly trained and have experience with these methods is crucial to building workforce capacity. With the emphasis on quality over speed, even a team of experts requires adequate time and funding to engage in scientific legal mapping. The health research field at large needs to recognize the value in robust legal data in order to demand resources required to maintain the necessary infrastructure. To garner the support needed to spread the use of scientific legal mapping, researchers, peer reviewers and consumers of scientific research on law must demand the same level of quality in legal data as they do in other kinds of data.

Scientific legal data can be difficult to create and time-consuming to maintain, particularly in real time. Scientific tracking in real time is possible with the necessary resources, but there are limits to how fast it can be done. It remains to be seen whether scientific legal mapping, including traditional policy surveillance methods, can meet the public demand for real-time information. The flexible methodology allows for slight tweaks (e.g., crowdsourcing parts of the research process), however, the core tenets of the policy surveillance process must be maintained, and any trade-offs impacting data quality (e.g., reduction in the level of quality control) should be carefully considered. Crowdsourcing parts of the research or legal coding process can leverage networks, build new relationships, and speed the data creation process. Self-reporting and other crowdsourcing methods could be especially useful in underrepresented communities or tribal territories, where policies may be more difficult to access. Machine-assisted research is another potential solution. These types of force extenders could be particularly helpful in gathering local data given the large number of jurisdictions that could be included.

The importance of evaluating law as a primary intervention in health research cannot be overstated, particularly amid a pandemic that gave rise to the rapid implementation of policy as a leading response effort worldwide. While the prompt collection and diffusion of legal change is critical to information sharing and situational awareness, legal evaluation studies demand rigorous legal data, which can be created using scientific legal tracking methods.

Sufficient infrastructure and funding are needed to support the widespread use of scientific legal mapping, particularly during a pandemic when timely and rigorous research is essential to
learning which mitigation measures help and which harm our health. This type of policy tracking is necessary to create the legal data required not only to effectively respond to the current pandemic using science and data, but also to bolster public health infrastructure in the future.

Recommendations for Action

- **For funders:** fund policy surveillance and legal evaluation research. As part of implementing President Biden’s Executive Order on Ensuring a Data-Driven Response to COVID-19 and Future High-Consequence Public Health Threats, federal agencies should fund policy surveillance efforts to create, update, and maintain longitudinal legal data related to the COVID-19 legal response in the United States. Health philanthropies like the Robert Wood Johnson Foundation, which supported the creation of a few of the policy tracking resources in Table 1.1, are critical to providing and maintaining the necessary infrastructure and resources to support ongoing scientific legal mapping. However, for law to be studied and evaluated with the same rigor as is used for other interventions of importance to population health, research centers and agencies like the National Institutes of Health must recognize, and invest in, law as a primary target for health research.

- **For state and local governments:** make laws and policies accessible for policy surveillance to facilitate legal evaluation studies, ultimately supporting evidence-based policymaking. When enacting laws or establishing policies in response to a public health crisis, consider ways to support the creation of longitudinal legal data by ensuring all legal text (including historical versions) is accessible to the public. The creation of legal data will provide researchers the foundation for legal evaluation studies, which can ultimately support evidence-based policy making at the state and local level.

- **For researchers conducting policy tracking:** Incorporate the core tenets of the policy surveillance process — reliability, reproducibility, and transparency — into your legal measurement methods.

- **For researchers evaluating the effect of COVID-19 legal interventions on health and health equity:** integrate variables that focus on equity and use rigorous legal data as the foundation for your analyses. COVID-19 has disproportionately affected Black, Indigenous, and people of color in the United States in terms of their health and economic wellbeing. It is essential that studies of policy responses to any public health crisis include measurements of equity. This could be done by choosing legal variables that could have a greater bearing on marginalized communities (e.g., business closures and eviction moratoriums), and by selecting jurisdictions that may be disproportionately impacted by the laws being tracked (e.g., Tribal jurisdictions and localities with a large Black population).
About the Authors

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References


