Revisiting Health Care System Data Priorities to Improve Population Health and Address Inequity

Chén C. Kenyon, MD, MSHP; Sonia A. Havele, MD; David M. Rubin, MD, MSCE

Coronavirus disease 2019 (COVID-19) has challenged our health care delivery systems in unprecedented ways, prompting adaptation and innovation in nearly every domain. In this environment of great uncertainty, the way to best leverage informatics capabilities to transform data into knowledge has become a central question for health care leaders. So far, rapid identification of relevant data using both national and local real-time dashboards has allowed health care systems to plan, evaluate, iterate, and then reevaluate institutional responses at remarkable speeds.1 Similarly, acclimating to the new normal has required organizational shifts from performance to learning mindsets across health care settings, emphasizing new ideas and workflows over existing clinician performance metrics.2-4

As we enter a new phase of the COVID-19 pandemic, cognizant of the unequal outcomes it has had in local communities, health care systems have the opportunity to revisit their priorities around what data can best support the ongoing surveillance and protection of the populations they serve. Reflecting on these priorities may allow better responses to subsequent cycles of disease and limit potential adverse consequences of the pandemic—and the pandemic response—particularly among those who are disadvantaged by disparities in health outcomes.

Revisiting Priorities and Defining New Data Needs

In areas where the rates of COVID-19 are rising fast and health systems are operating in triage mode, adequate testing and internal contact tracing may be all that is possible in the moment. For instance, our institution had an existing cohort of improvement advisors and data analysts charged with refining the safety and quality of patient care prior to the start of the pandemic. As COVID-19 cases emerged locally, this team quickly shifted its focus toward building dashboards that showed daily testing trends—both for patients and staff—as well as automated registries and databases to help our in-house contact tracing center more easily trace the contacts of individuals with positive cases.

Once caseloads start to wane, however, there may be greater bandwidth to consider broader commitments to patients and communities. A second priority includes refining standards of care and information provided to high-risk groups, including those living in institutional settings, those with serious chronic conditions, and underserved minority populations, given that evidence on the unequal outcome of the virus and foregone care is surfacing daily. As the health care system orients toward recovery and preparation for subsequent cycles of disease, understanding which populations are at higher risk of contracting COVID-19 or experiencing the adverse outcomes of COVID-19 mitigation policies becomes a primary concern.

To this end, health care systems with sufficient analytic and population health capacity can leverage their existing data systems to build tools that better serve these populations via reports and filters that highlight important demographic characteristics, such as age and race/ethnicity, as well as high-risk chronic medical conditions. For example, the asthma population health team at the Children's Hospital of Philadelphia reviewed the first 65 cases of confirmed COVID-19 among children with asthma, a condition that is more prevalent and severe in Black and some Latino populations. This review process has been automated into a registry on individuals with COVID-19 that crosslinks with existing registries for asthma, sickle cell anemia, and other chronic childhood conditions. These
preliminary efforts helped confirm reports from other health care systems that COVID-19 infection has a relatively mild outcome on many pediatric chronic diseases, including asthma. This infrastructure will allow ongoing surveillance of the outcomes of COVID-19 on children with the dual threat of chronic medical conditions and societal disadvantages.

Health care systems have also augmented existing data systems to serve patients directly affected by COVID-19. COVID Watch is a program developed at the University of Pennsylvania that provides home monitoring and automated text messaging to patients with COVID-19 to assess disease progression. The program is ordered directly through the electronic health record and has successfully focused on a mostly underserved minority population, allowing timely connection to a dedicated team of 24-7 telemedicine clinicians who advise and assist with care escalation when needed. A similar remote monitoring system at Geisinger Health System packages a digital thermometer, pulse oximeter, and automatic alerts with subsequent telehealth visits for worsening symptoms or data trends.

Health care systems also must share their evolving knowledge with institutional and community partners to mitigate the negative outcomes of disease and disease-associated policies on the health and well-being of their most vulnerable populations. For example, a recovery dashboard could provide data not only on COVID-19-associated morbidity but also on trends in mental health diagnoses, food insecurity, and child maltreatment, which have been reported as potential consequences of COVID-19-associated policies. Data could be aggregated at the neighborhood level and integrated with information on local outbreaks to create tools, such as one developed at our center, that allow clinicians to focus on those at highest risk. These data, which are often difficult to routinely procure or aggregate across health care systems, could complement data on trends from local and state agencies reporting changes in public health insurance enrollment and unemployment claims.

From Priorities to Dashboards and Beyond

These priorities are likely to play out in many different ways within local areas and across health care systems. Thus, health care systems must be well positioned to integrate data trends on key population health and well-being metrics that can inform COVID-19 policy making at the local level.

One important caveat is that health care systems require sound infrastructure to quickly create real-time care management dashboards that identify both patients with COVID-19 and those at high risk of adverse outcomes. Without this foundation, health care systems must rely on external data sources, which may not offer the granular and timely views that can be so useful in a rapidly evolving situation.

Subsequent cycles of COVID-19 and the downstream consequences of the pandemic are only starting to unfold. Our job now is to learn from experiences on the ground while doing the best we can to keep patients well and reduce pervasive systemic inequity. A meaningful first step is recommitting to mold the data infrastructure and capabilities of health care systems to meet the evolving needs of populations at risk for COVID-19.

ARTICLE INFORMATION

Open Access: This is an open access article distributed under the terms of the CC-BY License.

Corresponding Author: Chen Kenyon, MD, MSHP, PolicyLab and Population Health Innovation, Children’s Hospital of Philadelphia, Roberts Center for Pediatric Research, 2716 South St, Philadelphia, PA 19146 (kenyonc@email.chop.edu).

Author Affiliations: PolicyLab and Population Health Innovation, Children’s Hospital of Philadelphia, Philadelphia, Pennsylvania (Kenyon, Rubin); Department of Pediatrics, Children’s Hospital of Philadelphia and University of Pennsylvania Perelman School of Medicine, Philadelphia (Kenyon, Havele, Rubin).
Conflict of Interest Disclosures: Dr Kenyon reported a grant from National Institutes of Health (K23HL136842) during the conduct of the study. No other disclosures were reported.

Acknowledgement: The authors thank Shawna Dandridge for her thoughtful review of this article.

REFERENCES