Considering the intersection between implementation science and COVID-19

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As we continue to understand and react to the ongoing challenges presented by the COVID-19 pandemic, there is much that the scientific community is doing to help, from improving understanding of spread, identifying strategies to prevent transmission and optimize treatment, and to inform surveillance, health care and public health systems. Given that so many interventions are being implemented at local, state/province, national and global levels, implementation science (IS) can add value by increasing our knowledge base and supporting the global response to the pandemic. And yet, there should also be no question as to the predominant principle going forward: Patient care and population health is (and should always be) paramount. While IS (as I discuss below) can play a role in supporting the global response, it is paramount that any efforts should adhere to this principle and not override it. We gain nothing, and contribute nothing, if our actions impede the ability to test, diagnose, treat, and support those directly affected by the virus. Within these important constraints, there are a number of ways in which the IS community can contribute to (and in turn learn from) the current pandemic. This commentary briefly touches upon three major areas of integration between IS and the COVID-19 pandemic.

How can IS concepts help understand COVID-19?

For most any health or health care topic, the pathway to optimal benefit for populations goes to the ability of community and clinical settings to effectively adopt, implement, and sustain evidence-based interventions. In the presence of the pandemic, a number of core IS concepts remain relevant both to assessing the impact of the virus and in working to respond to it.

Different stakeholders have different needs for information, interventions

Key stakeholder groups differ greatly in their need for evidence and for interventions. The impact of the pandemic extends across many different sectors, and effective implementation must account for how best to provide the information most relevant to different stakeholders (e.g., general public, patients, caregivers, providers, administrators, policymakers), and to ensuring interventions fit those who are targeted (Chambers et al., 2013). The pandemic presents an opportunity to apply lessons from dissemination research about the importance of effectively synthesizing, packaging, and transmitting relevant information, and about the many ways in which mass communication, traditional and social media, and peer networks interpret evidence and how it informs decision-making by the public. Recent recognition of the potential for "misinformation" (Chou et al., 2018) reinforces the importance of understanding how dissemination pathways are promoting or inhibiting response to the pandemic. That said, effective dissemination doesn't always lead directly to behavior change. Our dissemination efforts must be integrated with implementation of a range of evidence-based interventions, as described below.

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Implementation matters

A multitude of efforts to mitigate the direct impact of the pandemic are underway at local, state, national, and global levels. There are treatment interventions for those diagnosed in hospital and at home, and a range of public health interventions being employed to prevent infections among those not yet exposed, impacting an unprecedented percentage of the national and worldwide population. And yet, success lies in our attention to how well these interventions are being implemented, and as a result, whether the interventions were as beneficial as expected. How effective are our information dissemination strategies to explain what is being implemented and why? How successfully can we enable effective use of protocols designed to improve outcomes for patients and citizens alike? Knowing the barriers and facilitators to implementation of the many interventions, multi-level implementation strategies (e.g., training, workflow changes, use of available resources, outcome measures to inform subsequent implementation efforts) (Powell et al., 2017) must be considered hand-in-hand with the interventions themselves.

Context matters

IS has reinforced the importance of understanding the fit between interventions and the contexts in which they are delivered. Rather than assuming a one-size-fits-all approach, we must recognize that population needs differ across contexts, resources and health care capacity differ, and the benefit of interventions will differ as well. The better that we can understand the characteristics of the populations, communities, systems and what they need to respond to the pandemic, the more likely our actions are to be effective. This includes understanding the direct impact of the virus on the infected population, as well as the indirect impact of the response (e.g., mental health needs of patients, caregivers, clinicians, and the general population; delays in other health services). Particularly important is learning from the variation in needs and responses across cities and towns, states and provinces, and between countries. The implications for decision-making at local, national, and global levels rely on this understanding of context, as well as the cross-cutting impact of actions across different sectors (e.g., education, health care, transportation, etc.) (Sweet et al., 2014).

Implementation is multi-level, multi-sectoral, and complex

Finally, IS reminds us that implementation is a multi-level process (often involving individuals, teams, organizations, systems, communities, states, and countries) (Urquhart et al., 2014). Efforts to manage COVID-19 require careful consideration of how different interventions have implications for actions at each level and what strategies can be most effective for each target. Similarly, we know that interventions in one sector (e.g., closing stores to mitigate spread) will have knock-on effects on a range of other sectors (e.g., economic activity, salaries, food and clothing supply, etc.). Society's ability to effectively mitigate unintended consequences of implementing sweeping interventions will be very important and will likely require ongoing coordination of activity well beyond health care and public health, as well as ongoing evaluation of the direct and indirect consequences of implementing the many interventions (Walensky & del Rio, 2020).

How can implementation scientists help?

Studying ongoing efforts to provide care for those directly affected

The impact of the virus on health care settings has required many hospitals and clinics to rapidly modify how they are providing treatment to those with acute care needs, both those for whom the virus is the chief health concern and for those requiring care for other health conditions. In response, many changes to care are being implemented, and implementation scientists can help to study the impact of those efforts, what lessons can be learned not just about what to implement but how to effectively implement and sustain those interventions. As new insights emerge about the virus, implementation of a range of new approaches will likely expand, and with more experience should come new knowledge about optimal implementation, with a priority on distinguishing whether insufficient benefits to health result from ineffective interventions or from effective interventions that were ineffectively implemented. Implementation scientists have the expertise to help carry out these studies and give greater insights into the best way to implement effective interventions for those with COVID-19, as well as additional care needs (e.g., mental health care for those impacted by the societal changes, traumatic events caused by the pandemic).

Understanding impact of health system surges on ongoing health care needs

In the first few months of the epidemic, we have seen health systems prepare for the surge of patients with coronavirus needing acute care, and needing either to shift other health care services to telehealth appointments or to delay visits and procedures until after the peak of the crisis hits. In the presence of all these changes, it may be helpful to study whether certain interventions are being de-implemented (Norton & Chambers, 2020) while others are implemented in their place? What is the impact of de-escalation or delaying of care for some conditions? For many who have

comorbidities, how is care for COVID-19 integrated within other needed services? How are technologies best used to provide evidence-based care in different domains? With respect to cancer care, for example, what might the impact be of delays in receipt of evidence-based screening, detection, and treatment, and how are services being implemented with an eye toward people at greater risk for the virus? For a range of chronic diseases that typically require regular health care visits (e.g., diabetes, depression and anxiety, cardiovascular disease), how do patients and practitioners adapt this care so it can be sustained without compromising the health of patients? Implementation scientists can help determine effective implementation strategies and meaningful ways to learn from ongoing changes to health care delivery efforts.

Learning from variation in policy implementation

At every level of our system—federal, state, county, city— there has been a massive policy response to mitigate the effects of the virus on the US population, mirrored by similar efforts in every country touched by the pandemic. The population impact of these policies lies not just in their formulation and dissemination, but how well they are implemented, evaluated and enforced. Implementation scientists can help to learn from both the variation in what policies have been rolled out in different jurisdictions and how they have been rolled out. Implementation scientists can study these "natural experiments" to learn how different public health policies have been optimally integrated and what implementation strategies (e.g., information dissemination, financing, training) have supported policy adherence. One clear example of the variation of the policy response is the shift of many services from traditional institutions (school, primary care setting, mental health clinic) to home, and the increased responsibility for nontraditional practitioners (e.g., family members, volunteers) to cover typical services while many health care workers have shifted to direct services for patients needing acute care. While "task shifting" has been used in low-resource settings to extend provision of health care (Dorsey et al., 2020), the scale of these shifts seems unparalleled. Still more variation has been introduced as various jurisdictions have moved from in-person to online interaction for work, education, health, and commerce. Studying the impact of these short-term shifts, as well as what happens following the acute phase of the response (e.g., do the online educational and health services remain or disappear over time and how does this vary across different communities, states/provinces, and nations?) will help for future system planning, both in times and crisis and stability. This will be particularly important to avoid exacerbating health disparities in traditionally underserved populations, an ongoing priority for IS (Cabassa & Baumann, 2013).

What lessons can IS learn from COVID-19?

The rapid onset of the pandemic and its immense impact on all aspects of society have put into sharp focus a number of things that the IS community needs to consider, not just in optimally supporting the ongoing response to COVID-19, but as we continue to work to improve the quality of health and of health care for our population. These lessons are those that we should apply to our efforts to improve clinical and community practice going forward.

First, we must take great care to ensure that our implementation studies do not increase the burden on patients, providers and systems. Even in the absence of a population-level health crisis, we should never lose sight of the necessity of keeping the very people who implementation scientists are motivated to help at the center of the decision-making for our studies. While it is unavoidable currently, it should always be.

Second, the ever-evolving conditions of the pandemic and the large number of iterative decisions made to respond to it remind us of the need for our field to improve its ability to design and execute rapid cycle studies. While there have been calls for this in recent years, the current crisis shows that we risk missing valuable insights on implementation if we can't get there quickly enough, nor monitor the rapid change. Many of our IS frameworks (Nilsen, 2015) assume a lengthy process to identify an implementation opportunity and support adoption of an intervention, develop and execute an appropriate implementation strategy, and then track implementation outcomes and plan for sustainment. In this context, there is no lengthy preparation period, and thus we may find the need for alternative frameworks to better reflect the immediacy of implementation.

Third, so much implementation activity is ongoing that to prioritize the right questions cannot be done in isolation of the key stakeholders in the public, clinical and community practice and policy. Establishing durable processes of improving the engagement (and leadership from), these key partners is essential to maximizing implementation science efforts in all topics. If done well, it can help us not only on the front end, but to pave the way for the results from implementation studies to be more generalizable and more likely to be integrated into community and clinical systems.

Similarly, the current crisis has led to extraordinary collaboration and coordination across researchers and practitioners, across states and countries, across public and private sectors, unified in the desire to minimize the impact of the pandemic on the global population. In the midst of this crisis, we have seen rapid response to ongoing challenges of care provision (e.g., expansion of telehealth capacity, large-scale support for financing of virus testing), challenges that in the past have been significant impediments to evidence-based practice implementation.

The degree to which these examples can help us rethink what strategies can overcome other challenges (e.g., extending telehealth to support more mental health and substance abuse care) is something for implementation scientists to consider, both as we seek to generate evidence learned across implementation efforts, and as we build a more cohesive approach to disseminating that evidence to drive evidence-based practice and policy. While the course of the pandemic is still uncertain, the opportunity to both support and learn from the response should not be missed.

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