How Do We Build the Human Capital for a True Learning Healthcare System?

Comment construire le capital humain pour un véritable système de santé apprenant?

COMMENTARY

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ABSTRACT

Our healthcare systems depend on human capital for effectiveness. The Canadian Institutes of Health Research – Institute of Health Services and Policy Research has prioritized building capacity for "solution-oriented research and evidence-informed health care system transformation" (CIHR IHSPR 2021a: 20) as a core strategic direction. In this commentary, we articulate strategies for positioning PhD-trained scientists at the forefront of this transformation, including refreshing a competency framework that outlines the skill set required for maximum impact, exploring opportunities to expand embedded research career pathways and considering new ways to support the evolution of learning health systems. We conclude highlighting the need to modernize how real-world research impact is recognized.

RÉSUMÉ

L'efficacité de nos systèmes de santé dépendent du capital humain. L'Institut des services et des politiques de la santé, des Instituts de recherche en santé du Canada, accorde la priorité au renforcement de « la capacité de recherche axée sur les solutions et la capacité de transformation des systèmes de soins de santé fondée sur des données probantes » comme orientation stratégique fondamentale (CIHR IHSPR 2021a : 20). Dans le présent commentaire, nous formulons des stratégies pour positionner les scientifiques titulaires d'un doctorat à l'avant-garde de cette transformation, notamment en actualisant un cadre de compétences qui décrit l'ensemble des compétences requises pour un impact maximal, en explorant les possibilités d'élargir les cheminements de carrière en recherche intégrée et en envisageant de nouvelles façons de soutenir l'évolution des systèmes de santé apprenants. Nous concluons en soulignant la nécessité de moderniser la façon de reconnaître l'impact de la recherche dans le monde réel.

Introduction

The COVID-19 pandemic has underlined long-standing problems with our healthcare systems. These problems range from inadequate human capital, inequities in access and outcomes, fragmented and siloed care, poorly coordinated healthcare and public health systems and evidence to policy and practice gaps, among others. None of these challenges should be a surprise to us. For years, we have had clear evidence of significant deficiencies in our healthcare systems. A recent Public Health Agency of Canada report published

the year before COVID-19 emerged highlighted pervasive and profound problems and inequities across the country (PHAC 2018). We have known about the capacity limits of our healthcare systems for a long time. At the start of the pandemic, Frances Wooley of Carleton University noted that "Canada has so few acute-care beds that even the flattest of curves will overwhelm hospitals" (Woolley 2020). As the pandemic has progressed, the consequences of these deficiencies have become increasingly clear.

As governments and institutions have struggled with the pandemic, the need for scientific information in all its forms in shaping our response and informing the public has become evident (Lemay and Fraser-Arnott 2021). The pandemic has also made clear the critical role played by the people who produce and work with this information. Across jurisdictions and different policy approaches, what has been evident is the need for interdisciplinary teams of scientists and health system leaders who can bring timely evidence to bear on pressing challenges and counter misinformation; communicate evidence clearly and transparently to build trust and ensure accountability; engage and collaborate with various governmental and non-governmental stakeholders to develop consensus and coordinated responses; and reconfigure healthcare systems to emphasize equity and adjust to changing contexts. The pandemic has also revealed the importance of agile mechanisms that enable scientists to engage with and inform those in charge of delivering policy responses.

As we recover from the pandemic, it will be important to take stock of the impacts and devastation, build on the lessons learned to address long-standing challenges and move toward healthcare systems that promote population health and well-being and provide excellent and equitable care for all. It will be critical to remember that our healthcare systems depend intimately on human capital for their effectiveness. The Canadian Institutes of Health Research (CIHR) – Institute of Health Services and Policy Research's (IHSPR's) *Strategic Plan 2021–2026* has prioritized building capacity for "solution-oriented research and evidence-informed health care system transformation" as a core strategic direction (CIHR IHSPR 2021a: 20). To do so, IHSPR has emphasized the following mechanisms:

- training researchers who can straddle the academy and the health system;
- embedding research capacity in our health system organizations;
- enriching traditional research training in health services and policy research (HSPR) with the professional competencies needed to lead change and collaborate effectively with diverse stakeholders; and
- building capacity for the interdisciplinary and intersectoral collaborations required to solve complex healthcare challenges.

This full suite of strategies is needed to build the human capital that can effectively advance what we are now calling learning health systems (LHSs) (Institute of Medicine [US] Roundtable on Evidence-Based Medicine 2007) and generate more effective and equitable care. In this commentary, we articulate the ways in which our PhD-trained scientists, with particular emphasis on PhD trainees, may be leveraged to ensure that highly trained human capital is at the forefront of evidence-informed healthcare system transformation.

The Initial Training Modernization Initiative

Prior to IHSPR's latest strategic plan, the Institute launched a pan-Canadian strategy development exercise focused on building an LHS for Canada (Terrence Sullivan and

Associates 2014). A training modernization task force of academic and health system leaders, trainees and research funding agencies was created to address the training modernization necessary to build LHSs. This task force produced a pan-Canadian strategy for modernizing HSPR PhD training (CHSPRA 2015). The strategy included an expanded set of core competencies that encompass professional skills to help PhD graduates have a greater impact on the health system (e.g., leadership, change management) (Bornstein et al. 2018) and open up new career avenues outside the traditional university setting, a plan to build an open-access pan-Canadian curriculum centred on these enriched core competencies and a map of potential career trajectories for PhD graduates in sectors and roles beyond the academy (Bornstein et al. 2018; CHSPRA 2015).

The training modernization strategy also identified the importance of including experiential learning in HSPR graduate training and, to this end, prioritized creating embedded research training opportunities for PhD trainees and graduates to apply their research skills to high-priority challenges identified by health system organizations. Accordingly, the Health System Impact (HSI) Fellowship program was created to address this priority and to increase research capacity within health system organizations and promote a culture of rapid learning and improvement (CIHR IHSPR 2021b; McMahon and Tamblyn 2019). Since its creation in 2017, the program has funded 200 PhD trainees and postdoctoral fellows who have been embedded in more than 100 health system organizations and connected to 24 university training programs across Canada (CIHR IHSPR 2021c). The program has been found to contribute to fellows' competency development, particularly in domains not currently emphasized in most HSPR doctoral curriculums (e.g., leadership) (McMahon et al. 2019).

HSI fellows are recognized for their wide-ranging impacts, including knowledge creation, building organizational capacity to conduct and use research and informing health system decision making (Blanchette et al. 2019; CIHR IHSPR 2021d). Although the aim of this training modernization initiative – to train a new cadre of research leaders with the skills to bring evidence to bear on complex health system challenges – was not new and built on previous Canadian innovations (Hamelin and Paradis 2018; Martens 2008) (https://www.mitacs.ca/en/programs/elevate), it can be seen as the first pan-Canadian effort to build the human capital required to advance LHSs. There is, however, more to be done.

Options for Building the Human Capital We Need

New competencies for stronger and more equitable impact

The COVID-19 pandemic has emphasized the importance and necessity of an even wider set of competencies among health and research leaders to address complex system challenges, engage intersectorally and integrate an equity lens in all facets of research, policy and practice. Three competencies to integrate within the enriched core competency framework and HSPR training programs spring to mind. To begin with, it is clear that an earlier focus on *equity, diversity and inclusion* (EDI) would have led to a stronger and more equitable response to the pandemic. The pandemic magnified long-standing systemic inequities in our health and social systems and catalyzed recognition of the importance of health system leadership with a commitment to equity, an understanding of the drivers of structural discrimination, the skills to engage with historically excluded communities and the tools to identify and implement equity-grounded solutions. The importance of EDI

is not limited to the effects of the pandemic; many, if not all, of the challenges facing our healthcare systems are tightly intertwined with problems of inequity and require a diverse workforce with the training and support to envision and build a more equitable and just future.

The pandemic has also emphasized the critical role of transparency and broad engagement in bringing about effective change. The importance of clear *scientific communication and public engagement* became evident as jurisdictions that possessed both were able to mount more effective responses to the pandemic with greater public support. The role of skilled scientific communicators in helping inform and generate pandemic responses was clear. We witnessed strong scientific communicators become regular and trusted fixtures in the media, while poor communicators became instruments of divisiveness and misinformation. At the same time, public engagement in all of its forms was the defining feature of a successful response to the challenges of the pandemic, including the ability to distill an overabundance of information and manage misinformation, organize coalitions of volunteers, crowdsource innovations, communicate on social media and manage corresponding risks such as harassment and maintain support for public health measures and vaccination. Science communication and public engagement may be new competencies to add to the PhD toolbox.

Reflecting on Canada's experience during the pandemic is likely to generate additional ideas on the competencies that will help our doctoral graduates contribute to stronger and more equitable healthcare systems. Thus, the training modernization task force has been reconstituted and is leading a community engagement exercise with the HSPR and population and public health (PPH) communities to garner input and advice. The training modernization task force is exploring which of the original competencies remain relevant, which should be removed or adapted and what competencies should be added for greater relevance and impact. This engagement will generate a refined and updated competency framework that encompasses the skills PhD trainees will need to address the health system challenges of today and the future.

Following this work, the training modernization task force will then shift its focus to the 2015 training modernization strategy's aspirational goal of building a pan-Canadian curriculum centred on the core competencies. Currently, the competencies have been incorporated in the HSI Fellowship program and are also available, to varying degrees, in some PhD training programs. A recent survey of the HSPR community indicated that the majority of university respondents (e.g., trainees, professors, administrators) felt their program provided little to no training in leadership, change management, project management and dialogue and negotiation (CHSPRA n.d.). A next step for the training modernization task force is to engage with universities across Canada on the scale and spread of the competencies to ensure that all PhD trainees in HSPR and PPH have access to impact-oriented training.

Embedded research and expanded career pathways

Under IHSPR's leadership, the HSI Fellowship program has grown quickly, receiving increasing demand each year from trainees interested in embedded research training opportunities and from health system organizations interested in building their internal research capacity. To date, a considerable cadre of embedded researchers has already been built. Graduates of the program have moved

into research-related careers that span several sectors other than academia, including public health, healthcare delivery and governmental and not-for-profit organizations (Kasaai et al. 2022). They are the change agents of the LHS, and it is worth considering how these embedded scholars, their career paths and the organizations involved can be supported moving forward.

Such support likely requires several changes in the health services and policy ecosystem. The early career stage that follows the doctoral and postdoctoral periods is recognized as a precarious and challenging time, and early career support thus far has focused almost exclusively on traditional career paths within academic settings. Innovative new funding programs are required to help early-career embedded researchers develop sustainable career paths in non-academic or hybrid health system–academic settings. Such programs would provide the time and resources needed to advance their maturity as embedded scholars, their network and relationships across the academic and health system communities and their competencies for health system impact. Such programs would also help to navigate and mitigate some of the potential tensions regarding research independence and academic publishing that could arise in an embedded research context when the researcher is employed by the organization and when the organization sets the priorities for research. Careful monitoring and attention to these potential tensions will be required along with risk mitigation strategies. The HSI Fellowship and embedded research programs in the US offer some insight into possible strategies, including negotiating protected time for independent research through a formal relationship with a university (Isaacson and Simpson 2021) and the use of agreements or contracts specifying the terms and conditions for the embedded research position (e.g., the right to publish, management of confidential information, intellectual property, protected time for independent research, university affiliation).

As demonstrated through the HSI Fellowship program, dual mentorship models that include both a health system and an academic mentor are highly valued (Bornstein et al. 2019). Moving forward, it may be worth considering a mentorship program that supports both the early career–embedded researcher and the mentor to ensure that the latter also receives resources needed to optimize success. This two-pronged approach would recognize the critical but often undervalued and under-rewarded role of mentorship in career progression and impact.

Considering ways of increasing the access of embedded researchers to research funding may also be needed. This could be achieved by revisiting the eligibility criteria for who can hold peer-reviewed grant funds to ensure that the scholars who pursue the embedded research career path are able to compete for and attract research funds within their health system organization.

Likewise, there may be a role for programs that deepen the capacity of embedded research within healthcare organizations, including developing staff expertise to understand and use evidence to inform decisions, strengthening their collaborations and partnerships with academic organizations and improving their internal receptor capacity for rapid learning and improvement. Evidence indicates that developing the capacity and infrastructure within healthcare organizations for the conduct and use of research requires substantial effort but translates into better outcomes and higher quality care (Kitzman et al. 2021). Academic organizations also stand to benefit from strengthened relationships with health system organizations,

including increased insight into health system priorities and opportunities for applied research, an expanded and enriched pool of professors with leadership and real-world expertise, experiential learning and employment opportunities for students and accelerated knowledge mobilization. A multi-faceted strategy that bolsters the capacity development of people (embedded scholars) and health system organizations, and strengthens relationships between universities and health system organizations, may help Canada build and retain the human capital for the "solution-oriented research and evidence-informed health care system transformation" articulated in IHSPR's strategic plan (CIHR IHSPR 2021a: 20).

Modernized concepts of research impact

Finally, to advance embedded research and support evidence-informed healthcare system transformation, universities, research institutes and funding agencies must appropriately recognize and reward impact. Impact in the context of an embedded researcher or embedded research unit within a healthcare organization centres on real-world impact, including bringing relevant evidence to bear on complex decisions, building organizational capacity for rapid learning and improvement and informing health policy and programs. Impact is not defined solely by, or limited to, the number of peer-reviewed publications. It includes the ability to contribute to real-world change that improves the health of people and the performance of healthcare systems. IHSPR and CIHR have identified the importance of working toward more inclusive concepts of research excellence and impact, but, for real change to occur, universities must do the same, particularly when considering promotion, tenure and recognition (Hunter 2019). For example, how does the university evaluate the work of an embedded scholar who has stimulated significant investments in new systems or processes by a health system? How does a peer review committee rank a curriculum vitae (CV) featuring policy impact and partnerships with health system decision makers compared to a CV featuring volumes of publications in high-impact journals? While some universities are making positive progress to recognize the value of engaged scholarship (University of Alberta School of Public Health 2017), widespread culture change is still pending. All partners must reconceptualize how to recognize, reward and value applied research innovations that lead to real-world impact if we are to continue advancing LHSs.

Conclusion

The IHSPR strategic plan envisions a future where researchers have the expertise, training and support for solution-oriented research that addresses complex health system challenges; where healthcare organizations embrace a culture of continuous learning and improvement, embed research expertise within their teams and use data and evidence to improve care; where the boundaries between the academy and the healthcare system are fluid; and where the academy and the broader research ecosystem recognize and reward scholarly contributions that lead to real-world impact. The original training modernization work (phase 1), its redevelopment (phase 2) and the HSI Fellowship program are starting points for generating the leadership and human capital required. However, we must also build a system wherein governments and healthcare providers embody a relentless commitment to data, measurement and accountability to truly establish solution-oriented research and evidence-informed healthcare system transformation.

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