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Vancouver Coastal Health informed COVID-19 response by applying rapid review methodology: reply to Tricco

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1. Introduction

We read with great interest the commentary written by Tricco et al. (2020) [1] titled “Rapid review methods more challenging during COVID-19: commentary with a focus on 8 knowledge synthesis steps.” As members of a new research team deployed to support public health decision-making on COVID-19, we appreciated the succinct overview of challenges associated with employing rapid review methodology in the context of COVID-19. In this article, we present our approach to handling these challenges from the perspective of applied researchers working within a healthcare organization. We provide a specific example of a rapid review on the topic of how long individuals infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) may transmit virus [2] to demonstrate how we addressed these challenges. In doing so, this paper offers potential solutions and practical tips to other research teams supporting evidence-based COVID-19 decision-making.

Vancouver Coastal Health (VCH) is one of five regional health authorities operating within British Columbia (BC), Canada that provides healthcare and public health services to both urban and rural residents living in the Greater Vancouver area and along the Garibaldi coast. By March 16, 2020, BC had reached its 100th COVID-19 case, with increasing numbers of patient hospitalizations (Fig. 1). Restrictions on international travel, large gatherings, and business and public facilities were ordered by the provincial medical health officer at this time [3]. Urgent policy and practice decisions were required by public health to inform healthcare clinical operations and guide regulations to protect against the spread of COVID-19.

(Fig. 1, adapted by L. Dix-Cooper from CBC News, 2020) [4]

A key challenge to making evidence-based decisions were unprecedented knowledge gaps presented by the novel pandemic. In response, a COVID-19 integrated Knowledge Translation (iKT) unit was created on April 1 to rapidly collect and appraise available evidence to help inform decisions being made by public health leaders at

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**Abbreviations:** BC, British Columbia; BCCDC, BC Centre for Disease Control; COVID-19, Coronavirus disease-2019; iKT, integrated knowledge translation; MLIS, Master of Library and Information Studies; NC-CMT, National Collaborating Centre for Methods and Tools; SARS-CoV-2, Severe acute respiratory syndrome coronavirus 2; VCH, Vancouver Coastal Health.

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VCH [5]. The iKT unit was located centrally within the Office of the Chief Medical Health Officer (Public Health). The unit consisted of clinical and public health researchers with experience in knowledge synthesis, as well as information specialists, policy experts, and research assistants. Given the rapid deployment of this unit, individuals on the team were drawn from existing VCH staff who possessed relevant skills, with additional volunteers recruited as available. In the discussion below, we present our approaches to the challenges outlined by Tricco et al. [1]. A graphical abstract is also provided as a visual summary of our methods and operational timelines.

2. Discussion

2.1. Challenge #1: Conceptualizing the question and scope through stakeholder involvement

We addressed this challenge by having a central and ongoing, consistent point of contact between the iKT unit and public health stakeholders: specifically, between the iKT unit leader and two public health representatives, one operational (Director of COVID-19 Public Health Operations) and one medical (Medical Health Officer, Director of Communicable Diseases). The iKT unit leader and public health stakeholders met weekly and emailed or called as needed to streamline communications to the iKT group and to ensure research activities and outputs were directly relevant to the decisions at hand. Developing these relationships early was critical for understanding the context for the research questions that were requested of the unit, defining the scope of research questions and desired output, and enabled rapid shifts in priorities as needed.

Likewise, effective working relationships among stakeholders internal to the iKT unit were critical. Incoming research questions were conveyed by the unit leader to the team and discussions related to scope occurred collectively to ensure clarity. An agile management approach involved daily virtual team check-in meetings to review and plan activities and priorities, provide feedback and guidance from the knowledge users, update on progress, and to clarify any outstanding questions. Additional project-to-project-specific smaller group meetings throughout the day organized by each project’s lead allowed for multiple reviews to occur simultaneously. Biweekly, the team reflected together on iKT unit operations and made necessary process improvements.

Duplication of research questions with other KT groups was avoided by the iKT unit lead being part of an informal ‘BC COVID-19 rapid review network’ that included other regional and provincial teams. This network regularly reviewed each group’s current research questions to identify areas of overlap, and share approaches and tools. Where topics overlapped, decisions were made to either collaborate on a topic or delegate one group to pursue the topic. All groups kept each other abreast of their reviews in progress and publicly posted completed reviews from other groups and individuals (e.g. registered systematic reviews (PROSPERO), National Collaborating Centre for Methods and Tools (NC-CMT)) [6]. Finally, one of the network’s members was part of a national COVID-19 evidence review group which allowed for completed reviews and ongoing topics to be shared.

As an example from early April, we were asked, “How long can individuals infected with SARS-CoV-2 transmit virus?” to inform policies being established by Public Health on the duration of isolation for COVID-19-positive hospitalized patients. In the early days of the pandemic, minimal evidence existed to inform such decisions and there were critical shortages in lab testing materials. Results from this review would be used to inform policies on
the number of days patients were advised to remain under isolation protocols in hospital in-patient settings.

2.2. Challenge #2: Conducting a literature search for COVID-19 rapid reviews

Having Master of Library and Information Studies (MLIS)-trained information specialists and trainees in the iKT team was critical to being able to navigate the explosion of scientific literature related to COVID-19. Depending on the specific review question, searches were performed on three sources of information: academic literature (peer-reviewed and pre-print manuscripts), grey literature, and news media. As new research questions were introduced, we decided early in the search process on which information sources would be considered relevant and inclusive. Search strategies were then rapidly tested for relevance and quality of data, with revision of key terms as needed, across multiple sources (ie, PubMed, medRxiv, etc.) and in consultation with other team members. We aimed for an acceptable level of specificity and sensitivity in search results that yielded an amount of literature that was manageable for the team to review and synthesize within the required time frame.

Information specialists regularly consulted COVID-19 research guides, and best practices were shared and discussed through a provincial network of health science librarians who were involved in conducting COVID-19 reviews. We drew from COVID-19-specific repositories, and uploaded search results to share with others in the librarian network using public reference management software (ie, Zotero, version 5.0.85) [7].

Language barriers were overcome using Google translate (a built-in add-on in Google Chrome) for shorter pieces of online content typically from grey literature or news media; otherwise only English-language items were considered. On rare occasions, we reached out to public health colleagues working in other jurisdictions and countries to identify and translate key information sources (ie, guidance and policy documents).

For our review of the period of SARS-CoV-2 transmissibility, we conducted the first iteration of the search on April 5, 2020, and yielded 31 papers from pre-print and peer-reviewed health science literature databases and grey literature sources. We conducted the final iteration of the literature search on September 29, 2020 and retrieved 1,482 articles. Search terms and methods are fully described in Park et al. (2021) [2].

2.3. Challenge #3: Conducting screening, data abstraction, and assessment of methodological limitations for COVID-19 rapid reviews

We worked closely to rapidly screen content, abstract data, and in some cases, assess the methodological quality of information; tracking of progress across multiple individuals occurred in real-time through a shared Google Drive spreadsheet. Factors that enabled rapid progress were the use of centralized real-time communication channels (ie, The Slack platform, version 4.10.3) [8] to coordinate activities and share and store information in a transparent and organized way for each research question, as well as a clear understandings of the research question at the outset. Screening was primarily conducted by single review with ambiguous items flagged for second review; any disagreements about inclusion were resolved by discussion.

Data abstraction was more time-consuming given the heterogeneity of information we encountered across various sources. We developed a unique data abstraction template for each research question, and harmonized/modified data abstraction through an initial pilot test of a template on several information sources. After we finalized data abstraction templates, multiple team members simultaneously abstracted data from the full text of the included information sources.

Assessment of the methodological quality of the research did not occur comprehensively nor uniformly across research questions, given time constraints. This was an important limitation stated in the rapid response reports that we generated, especially as much of the academic literature on COVID-19 consisted of pre-prints. Where assessment of quality occurred, it used an adaptation of a mixed methods appraisal tool [9].

Out of the original search results obtained on the duration of SARS-CoV-2 transmissibility from April, 12 articles of 31 were included. From the final search of 1,482 results, 161 studies were included that met inclusion criteria of which 26 were pre-prints. A modified quality appraisal process of included manuscripts was conducted [9], and the data abstraction template underwent three rounds of modification.

2.4. Challenge #4: Synthesis and interpretation of results for COVID-19 rapid reviews

We analyzed data directly from the abstraction spreadsheet, synthesized results primarily through a narrative approach and interpreted findings in the context of the public health decision at hand. Meta-analytical approaches were not used due to significant statistical and clinical heterogeneity of the original research.

The format of all rapid reviews followed a consistent structure: the initial section provided a concise overview of the research question, context for the rapid review, methods including a description of information sources, and a summary of key findings (eg. maximum reported durations of positive COVID-19 tests across all studies), limitations, and recommendations. This was followed by a more detailed section describing key findings, including a high level overview of the types of data sources including by study country of origin, and tables that provided a breakdown of main results from individual studies, per
key finding. A full reference list was also provided with all online sources hyperlinked.

For our review on duration of SARS-CoV-2 transmissibility, we updated and generated multiple reports. With an increasing amount of data abstracted from new articles with each update, we analyzed the data using R [10]. After synthesis and interpretation of findings, we used the format above to generate internal reports; and modified it for publication purposes [2].

2.5. Challenge #5: Dissemination and reporting out of COVID-19 rapid reviews

Initially, rapid reviews were shared within VCH Public Health and via e-mail to interested stakeholders. As the unit’s activities continued, a broader knowledge dissemination strategy was developed in conjunction with the BC COVID-19 rapid review network. A provincial online internal platform was developed which included a repository of reviews that had been collated and generated by the rapid review network, with access provided for public health stakeholders province-wide. We posted reports from the iKT unit on the public NCCMT KT website [11] and published our example review on the duration of transmissibility of SARS-CoV-2 on a pre-print server (ie, medRxiv) [12] prior to publication [2]. This review was also presented to the Provincial Infection Control Network of British Columbia to inform the release of provincial guidelines related to required isolation measures in hospital settings. Other public health KT groups may benefit from establishing a dissemination strategy and network in advance with communication linkages setup within collaborative networks between relevant agencies and experts.

2.6. Challenge #6: Updating COVID-19 rapid reviews

Updating reviews was a significant challenge, as updating activities had to be balanced with addressing new emergent questions. Stakeholders identified research questions where updated evidence would be critical to policy and practice decisions, and these reviews were selectively chosen to be updated. From a personnel perspective, select individuals on the team updated searches weekly. Reports were updated and shared with stakeholders when new findings were identified.

As highlighted in the previous sections, the rapid review on the duration of transmissibility of SARS-CoV-2 was updated at continuous intervals from April 2020 onwards until it was accepted for publication in September 2020 [2].

3. Conclusion and additional considerations

In this paper, we present strategies taken at VCH to overcome the challenges of conducting rapid reviews during the COVID-19 pandemic, and present a concrete example of a published rapid review [2]. Success factors included the specific structures and operational supports already in place within VCH that enabled the iKT unit’s activities. While such conditions may not be uniform across other organizations, there may be elements of the strategies that we applied that may be applicable and beneficial for other research groups currently in operation or in development.

Structurally, the iKT unit was embedded within the public health department and as such, had close, direct, and ongoing relationships with knowledge users. Team members possessed strong research, knowledge synthesis, policy analysis, and information science skills combined with content expertise in various areas of public health.

Operational supports that enabled the iKT unit’s activities included strong teamwork, an agile management approach, real-time communication and information sharing tools including Slack [8] for working collaboratively in virtual settings. Combined, these mechanisms enabled the team to establish and maintain a positive and productive culture which was vital to its ability to sustain activities and deliver knowledge outputs to meet public health decision-making needs.

Our iKT unit operated for three months before it was disbanded on June 30 (Fig. 1), as the spread of COVID-19 in BC came under control, businesses and public facilities partially reopened [3], and staff members returned to their original positions. Currently, regions of BC, Canada, and internationally are again under wider lockdown restrictions especially given the threat posed by novel variants [13]. We believe there is value to investing in the development and sustainment of embedded iKT units, such as the one described herein, especially given the dynamic nature of the current pandemic but also for future challenges that public health will face. Doing so will require a vision for applying iKT into practice and operations, and strategic investments to make it happen: hiring dedicated personnel to conduct knowledge synthesis and translation activities, building ongoing relationships across researchers and knowledge users, and fostering collaborations across multiple research groups and agencies.

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CRediT authorship contribution statement

Linda Dix-Cooper: Conceptualization, Writing - original draft, Writing - review & editing. Martin Dawes: Conceptualization, Writing - original draft, Writing - review & editing. Mina Park: Conceptualization, Methodology, Writing - original draft, Writing - review & editing.
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