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Maximizing research impacts on cancer prevention: An integrated knowledge translation approach used by the Canadian Population Attributable Risk of Cancer (ComPARe) study

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ABSTRACT

With a strong focus on end user, or knowledge user, engagement throughout the study, an integrated knowledge translation approach (iKT) is expected to enhance the quality, relevance and reach of research findings. From its initiation, the Canadian Population Attributable Risk of Cancer (ComPARe) study combined the expertise of the knowledge producers (cancer prevention researchers) and select knowledge users in an iKT approach. We describe in detail our iKT approach, including governance, outputs and early reflections. In our model, knowledge users were integrated as members of the research team or members of a KT Advisory Committee. The integrated knowledge users took a lead role on the KT activities for ComPARe, including developing the *KT Blueprint*, a four phase systematic approach to guide the planning and implementation of KT activities. This approach included planning, knowledge product development, dissemination and evaluation, with advisory committee engagement built in throughout. Our early reflections identified enablers and challenges of an iKT approach for this study. Enablers included co-investigators' commitment and attitude towards iKT, support for iKT from the funding agency, an established partnership early on, understanding of and experience in each other's area of expertise, dedicated funding, clearly delineated roles, advisory committee buy-in and existing tools. Challenges included anticipating all costs, continuity of involvement, competing priorities, relationship management and geographic distance. A future evaluation will determine the effectiveness and impact of the iKT approach and *KT Blueprint*. In the interim, the approach we describe here can be modeled by others interested in collaborative, action-oriented research.

1. Introduction

The Canadian Population Attributable Risk of Cancer (ComPARe) study brought together a pan-Canadian team of cancer prevention researchers to estimate the number and proportion of new cancer cases, in 2015 and in the future (to 2042), that could be attributed to preventable risk factors in Canada. This study, which examined more than twenty risk factors related to lifestyle, environment and infectious

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agents (Brenner et al., 2018), was conceptualized to provide evidence-based information that could inform cancer prevention policy and practice. To maximize the utility of the study results, the study implemented knowledge translation (KT) practices.

There are various definitions and synonyms of KT across disciplines, but KT generally refers to a set of activities and processes aimed at closing the gap between what is known from evidence and what is applied in practice and policy (Graham et al., 2006; Straus et al., 2009). One of the most commonly used definitions of KT in a healthcare context comes from the Canadian Institutes for Health Research (CIHR) (Straus et al., 2009), a major government funder of health research in Canada. CIHR defines KT as "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system" (Canadian Institutes of Health Research, 2016a). Further, they categorize KT into two approaches: end-of-grant KT and integrated KT (iKT) (Canadian Institutes of Health Research, 2015).

End-of-grant KT includes diffusion, dissemination or application of study results once the research is complete; whereas, iKT involves consideration of KT principles at the outset and throughout the research study (Canadian Institutes of Health Research, 2015). Moreover, the defining feature of iKT is the meaningful engagement of knowledge users in the entire research process as equal partners with the researchers, or producers of knowledge. Knowledge users are defined as stakeholders who can likely use the knowledge generated from the research to make decisions about health practices, policies or programs (Canadian Institutes of Health Research, 2016b). With a strong focus on end user engagement throughout, including defining the research question, an iKT approach is expected to lead to research findings that are more contextually relevant and therefore more useful to knowledge users. Through this collaborative approach, there exists an opportunity to benefit from both researchers' and knowledge users' expertise, resources, and networks to enhance the quality, applicability and reach of the study findings (Graham and Tetroe, 2007; Graham et al., 2014; Parry et al., 2015).

A central requirement of the funding for the ComPARe study was that the researchers work collaboratively with at least one Canadian Cancer Society (CCS) partner who was to be integrally involved in the study. Further, researchers needed to demonstrate in their application how the research would directly address cancer prevention priorities at CCS (Canadian Cancer Society, 2017). As such, the CCS-Partner Prevention Research Grant that funded the study was inherently designed to enable iKT research.

The ComPARe study brought together, from the outset, the *knowledge producers* (cancer prevention researchers) and a key *knowledge user* (CCS), in an iKT approach. CCS is a key knowledge user given the organization's mission to eradicate cancer, including through funding research, program delivery, public education and advocacy. Given CCS's expertise in cancer prevention, important networks within the cancer community and relationship with the general public, they are also uniquely positioned to participate in the production of knowledge as well as champion the study and its findings; thereby, enabling their lead role as *integrated knowledge users* in the ComPARe study (Box 1).

The integrated knowledge users took the lead on building and implementing an action plan (*KT Blueprint)* to guide the KT activities of the study and to enhance the relevance and uptake of the study results; thereby, maximizing the potential impact of the research on cancer prevention efforts in Canada.

The objective of this article is to describe the ComPARe study's iKT approach, including governance, outputs and early reflections to: a) contribute to the literature on iKT to further iKT science; and b) serve as a model for other research studies interested in implementing this approach.

2. iKT approach

The organizational and functional structure that underpinned ComPARe's iKT approach is illustrated in Fig. 1. The research team was composed of a group of co-investigators and their project staff. To capitalize on the research team's expertise, they were organized into five groups, or "Nodes", related to a focused area (methods, KT) or exposure group (lifestyle, environment and infections). The integrated knowledge users led the KT Node. The research team used an online collaborative space to share all study related materials. The research team had standing monthly teleconferences that provided an opportunity for updates, having discussions and facilitating feedback from each Node. Meeting minutes were saved in the online collaborative space. In addition, the full research team tried to meet face-to-face at least once a year to allow for more in-depth discussions. In between meetings, the research team communicated via email.

The KT Node included at least one CCS staff member throughout the course of the study.

The KT Node co-investigators held senior level positions at their respective organizations and had strong backgrounds in epidemiology, cancer surveillance and health policy analysis. The KT Node project team members had expertise in knowledge translation, health policy analysis and communications.

By being engaged at the outset, the integrated knowledge users helped shape the research questions and were involved in the joint submission of the grant proposal with the researchers. As integrated knowledge users, the KT Node played a key role in interpreting the study findings, framing the messaging around the results and implementing KT strategies to enable the uptake of results. Moreover, the scope of their role was extended to also advise on methods and data collection and, as such, went beyond the minimum requirements for iKT (Parry et al., 2015). Further, the integrated knowledge users participated in developing and reviewing publications for this study.

The KT Node took the lead on the KT activities for the study and developed a *KT Blueprint* (see below) to guide these activities. A key activity outlined in the KT Blueprint was the development of an advisory committee to engage other knowledge users. The KT Node developed and maintained the KT Advisory Committee, including brokering the relationship between the committee and the rest of the research team (see Section 4.1 Planning). The KT Node identified points in the research process where the KT Advisory Committee's input would be of greatest value and facilitated opportunities for their feedback.

3. KT blueprint: overview

To conceptualize the work of the KT Node, the team underwent two exercises: i) working through a popular template designed for KT planning for research called the *Knowledge Translation Planning Template* (Barwick, 2008, 2013); and ii) developing a specific action plan for the KT activities, referred to as the *KT Blueprint*.

The *Knowledge Translation Planning Template* was a practical tool that served as a useful starting point to assist with planning. The template is a brief checklist that facilitates an overall view of the KT work, including resources available for KT, KT expertise on the study, potential stakeholders and partners, anticipated key messages and possible KT strategies.

The *KT Blueprint* was developed to guide the work of the KT Node by specifying the phases of work, the objectives of each phase and the corresponding activities. A visual representation summarizing the *KT Blueprint* and major activities and outputs is shown in Fig. 2. The associated templates and tools used in each phase of the *KT Blueprint* are presented in Supplemental Table 1.

Box 1
Definitions of KT terms used for the ComPARe study.

Term	Definition
Knowledge translation (KT)	A dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system (Canadian Institutes of Health Research, 2016a).
Knowledge user	The anticipated end user of a research study who is likely to use the research results to make informed decisions about health policies, programs and/or practices (Canadian Institutes of Health Research, 2016b).
Integrated knowledge translation (iKT)	A KT approach that requires the meaningful engagement of knowledge users in the entire research process. This engagement is expected to produce findings that are more relevant and useful to the knowledge users (Canadian Institutes of Health Research, 2016a).
Integrated knowledge user	A knowledge user who becomes a partner, or is integrated, in the study and is involved in the production of knowledge during the research (Graham et al., 2014).

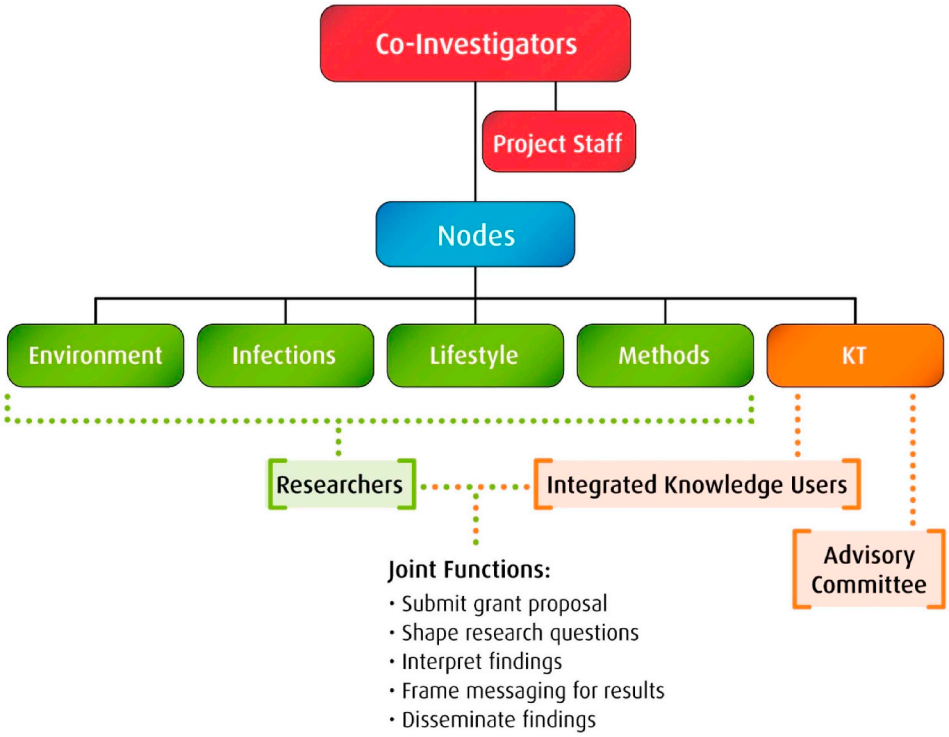

Fig. 1. Organizational and functional model for the ComPARe study
The research team was composed of a group of co-investigators and their project staff. To capitalize on their expertise, they were organized into five groups, or "Nodes", related to a focused area (methods, KT) or exposure group (lifestyle, environment and infections). In terms of functions, within the co-investigators team, there were researchers, who led the exposure-specific and methods nodes, and integrated knowledge users, who lead the KT Node. The KT Node also played a key brokering role by managing the relationship with other knowledge users represented by the KT Advisory Committee (see Section 4.1 *Planning* for more detail).

4. KT blueprint: activities

4.1. Planning

A logic model was developed to describe the explicit relationships between the KT resources, activities, outputs and the goals of the study (see Supplemental Fig. 1). Developing the model was a foundational exercise for the ComPARe research team, enabling a shared understanding of the desired study outcomes and the planned KT activities to reach these outcomes. As a visual tool that illustrates what the study plans to do and achieve, the logic model served as a useful communication instrument for describing the study to other stakeholders. In addition, as is common in evaluations, it was the first step in evaluation planning as it serves as a guide for developing evaluation indicators.

Next, an advisory committee was developed as a mechanism for engaging a breadth of knowledge users from ComPARe's target stakeholder community. To identify potential members, the *Knowledge Translation Planning Template* and the list of stakeholders who had provided letters of support for the study were key sources. ComPARe's KT Advisory Committee comprised 9 additional CCS members and 11 representatives from other stakeholder groups whose activities are relevant to chronic disease prevention, including provincial and federal government departments or agencies, charitable organizations, professional associations, healthcare providers, disease prevention networks and research programs. Together, they represented health promotion, advocacy, research, policy, and clinical practice. Where possible, there was representation from organizations related to exposure groups of interest (e.g. environmental risk factors) and major cancer sites (e.g. lung cancer). The membership term was for the duration of the study grant, which was approximately two years from the date the advisory committee was formed. The KT Node identified key points in the study where advisory committee input would be important and engaged them through teleconferences, two face-to-face workshops, and ongoing emails. The advisory committee was consulted on aspects of the research methods (for all study Nodes), framing of the messaging on the study results (from all exposure groups), identification and development of knowledge products and the dissemination and evaluation plans. The KT Advisory Committee did not interact directly with the researchers, except for with the co-principal investigators who participated in the face-to-face workshops. Instead, the KT Node relayed feedback from the advisory committee to the rest of the research team, thereby, championing the "voice" of these knowledge users.

The final component of the *Planning* phase was the development of a *KT Plan* (see Supplemental Table 2 for an excerpt of the plan). The KT

Fig. 2. *ComPARe Knowledge Translation (KT) Blueprint*
The *Blueprint* is structured into four phases—*planning*, *knowledge product development*, *dissemination and evaluation*—with advisory committee engagement built in throughout. The phases were sequential, with some overlap in activities, e.g. some dissemination planning necessarily overlapped with product development. Evaluative thinking throughout the study was a key principle of this *KT Blueprint* and the evaluation plan will be implemented after all dissemination activities are complete.

Plan describes the end-of-grant KT activities. Its purpose was to define the target audiences, the KT goals for engaging these audiences, the KT strategies to accomplish these goals and their anticipated timing. The first iteration of the *KT Plan* was co-developed during our first KT workshop with input from the advisory committee members. It then underwent several revisions. The final plan identified: 1) seven key stakeholder groups; 2) several KT goals for engaging these groups, from promoting awareness to impacting policy; 3) five KT strategies that reach multiple audience groups; and 4) three key points of audience engagement—during the study, immediately pre-publication and post-publication of the study results.

The *KT Plan* naturally led to the identification of priority knowledge products to facilitate the KT strategies and thereby was the reference document which informed the next two phases of our *KT Blueprint*: *Knowledge Product Development* and *Dissemination*.

4.2. Knowledge product development

The final suite of knowledge products took into consideration: an environmental scan of PAR products (e.g. reports, academic articles, bulletins, visualizations) (scan results available upon request); financial and people resources; the varying information needs of target audiences; and the breadth of ComPARe's findings. The products were developed to enable the wide scale promotion of the study and dissemination of its findings. The knowledge products can be broadly categorized as: an internal champion's toolkit and public facing knowledge products.

The champion's toolkit is a document that was developed for use by both the research team and select stakeholders, including members of the KT Advisory Committee, who could act as champions for the ComPARe's study. The toolkit would enable these stakeholders to promote the study and develop customized KT strategies, such as a media toolkit, to disseminate the findings within their networks. It provides in-depth information about the overall study, key messages, answers to anticipated questions and additional communication tools.

A website was built to serve as a single point of access for all stakeholders to learn more about the research study and its findings and to access the publically available knowledge products. The website was developed in both English (prevent.cancer.ca) and French (prevenir.cancer.ca). The knowledge products include: scientific publications, downloadable figures, infographics and a data dashboard. The data dashboard is the main mechanism for making available the large volume of statistics that were produced by ComPARe. The dashboard enables user-driven generation of custom statistics that can be downloaded in the form of various data visualizations. Although it is available publically, the dashboard was designed to meet the information needs of a subset of stakeholders, specifically researchers, policy analysts, public health practitioners and healthcare providers.

4.3. Dissemination

The third phase of the *KT Blueprint* involved building a stakeholder list and developing a dissemination plan. The list of stakeholders expanded on the audiences previously identified in the *KT Plan*, by specifying the names of targeted individuals and organizations. This information, coupled with the KT strategies identified in the *KT Plan*, informed the activities outlined in the dissemination plan.

The dissemination plan is a tactical document. It describes all the logistical details associated with a specific dissemination activity, including the target audience, the dissemination channel, required materials, timelines and the responsible person or group for the activity. The dissemination plan has the added benefit of allowing the study team to monitor the status of ongoing dissemination work and act as a record of completed activities.

An important consideration in building the dissemination plan was prioritizing activities that would apply to the broadest group of stakeholders while recognizing the available human and financial resources in the study. In addition, it was acknowledged that the KT Node would not be capable of implementing the full dissemination plan on its own since the level of knowledge and expertise required in some areas (such as in media relations) existed outside the team and the reach of the dissemination could be enhanced by engaging others. Therefore, a key aspect of the plan involved partnering with others to leverage both their expertise and networks.

The majority of dissemination activities were purposefully timed for implementation after publication of the study results in peer-reviewed journal articles. At the time of writing, dissemination planning was ongoing and an agreement was made by the KT Node and champions/partners to continue their engagement to support dissemination activities beyond their initial commitment date.

4.4. Evaluation

As evaluation planning early on is important and guides KT planning, during the *Planning* phase, the KT Node took the first step towards building an evaluation plan by developing a logic model. Several factors impacted completion of the full evaluation plan, including having a more concrete list of knowledge products, a complete dissemination plan and the onboarding of a dedicated resource to support this work. However, evaluation was still considered throughout KT planning. To ensure this, one KT node member was given the role of "evaluation champion." The full evaluation plan was finalized in the last phase of the study in consultation with the co-investigators. This plan will be fully implemented by the co-investigators approximately one to two years after the public release. The objective of the evaluation is to assess the effectiveness of the iKT approach and the *KT Blueprint*.

Although most of the evaluation plan will be implemented after study completion, it was important to consider evaluation planning alongside KT planning to identify the type of data that would be required for the evaluation. In so doing, time sensitive data that are most accessible during the research process could be collected and any necessary processes required for later data collection could be implemented. For the latter, this approach was particularly important to consider when building knowledge products and planning dissemination activities.

In terms of collecting time-sensitive data, one example is the assessment of the engagement of advisory committee members. As it would be difficult to engage with advisory committee members after study completion and participant recall would be a limitation, evaluation surveys were sent to the advisory committee members immediately after key points of engagement (e.g., in-person workshops) and at the completion of their term. Another example was collecting early reflections on the challenges and enablers of ComPARe's iKT approach. A survey will be administered to all members of the research team to gather their impressions at the end of study completion. In the meantime, the KT Node and co-investigators' early reflections on the challenges and enablers of the ComPARe's iKT approach was collected. The group was given a list of enablers and challenges for consideration. The final list was agreed to by consensus.

In terms of implementing processes for later data collection, evaluation metrics were considered during phases 2 (*Knowledge Product Development*) and 3 (*Dissemination*) of the *KT Blueprint*. In some cases, these metrics informed the development of certain products. For example, to gather usage data on the website in real time, it needed to be connected to a web analytics tool during its development. In terms of dissemination, an "evaluation metrics" section was added to the dissemination plan to ensure that relevant evaluation data could be collected for dissemination activities. For example, although the dissemination plan listed out conference presentations, a link out to a tracker for recording the details of each conference presentation was created to ensure this information was collected.

5. Discussion

The ComPARe study's iKT approach yielded a strong collaboration between knowledge producers (cancer prevention researchers) and knowledge users (end users), in which select knowledge users were integrated into the study and took a lead role on the KT activities. This lead role included brokering the relationship with the KT Advisory Committee – a representative group of other knowledge users – and leading the development of the *KT Blueprint*, a four phase systematic approach to planning and implementing the KT activities of the study. The ComPARe study's iKT approach capitalized on both researchers' and knowledge users' expertise, leading to research findings that are scientifically rigorous and contextually relevant, thereby enhancing their applicability. Furthermore, through this collaborative approach, there existed an opportunity to leverage both groups' resources and networks to enhance the reach and uptake of the study findings.

The benefits of iKT, many of which have been described here, are generally accepted and there is some evidence to support them (Graham et al., 2014). CIHR's evaluation of their knowledge funding programs found that generally, grants that supported an iKT approach were a "low-risk, high-return" investment for the funder that produced more impactful, action-oriented findings (McLean and Tucker, 2013). However, as Graham et al. (2014) discuss, although it confers many advantages, iKT can be resource-intensive and pose certain challenges. Thus, there are considerations for when this approach is appropriate (Graham et al., 2014; Kothari and Wathen, 2013).

In addition, there is an identified lack of research evaluating iKT impact and evidence on how best to conduct it in the health sector (Gagliardi et al., 2017; Graham et al., 2018; Kitson et al., 2013; Kothari and Wathen, 2017). As such there is a need for researchers to publish on their iKT approach in detail to help build the evidence base to enable iKT science researchers to identify factors that enable its success (Camden et al., 2015; Gagliardi et al., 2016; Gagliardi et al., 2017).

By reporting on our iKT approach in detail we describe the mechanisms by which we conducted iKT, the outputs associated with it, and our early reflections, including enablers and challenges. Accordingly, the findings described here are meaningful as they address two knowledge gaps in the literature. First, this information contributes to building the evidence base for iKT that can help advance iKT science research. Second, we provide a practical methodology for an iKT approach that others interested in collaborative research, especially in the area of population health, can consider and adapt for their own use. In addition, our early reflections on enablers and challenges of this approach provide important considerations to enable others' success in adopting this approach.

As Graham et al. (2014) indicate, there is no single governance model for an iKT approach. In ComPARe, knowledge users were both integrated into the research team and participated in an advisory capacity. This type of joint governance is described as "integrated" in the literature (Graham et al., 2014). To the best of our knowledge, ComPARe's application of the iKT approach is unique, whereby integrated knowledge users were both research team members involved in the production of knowledge as well as being entrusted with leading KT activities.

In our specific approach, we identified certain enablers to iKT but also experienced various challenges, similar to what has been identified by others (Camden et al., 2015; Gagliardi et al., 2016; Graham et al., 2014). These are discussed below in more detail.

5.1. Enablers

There were several enablers of the iKT approach.

First, CCS's inherent support towards iKT led to the establishment of a collaboration among knowledge users and knowledge producers at the outset of the study.

Second, the commitment and attitude of the co-principal investigators who championed KT was an important success factor. Their positive attitude and experience in KT practice was conducive to maintaining a partnership of respect, whereby this area of expertise was valued. This experience coupled with the integrated knowledge users' experience in cancer research, enabled a mutual understanding of each other's perspective. Further, it inspired an environment of trust, where the integrated knowledge users led the KT activities in a dedicated KT Node with its own budget.

Third, while the KT Node's expertise in cancer research helped garner the trust and respect of their peer investigators, the added expertise in communications, KT and health policy analysis positioned the Node as trusted leaders for effectively accomplishing the KT goals of ComPARe. It is important to note that even within the KT Node all members had a foundational understanding of each other's areas of expertise.

Fourth, the expertise of a broader group of knowledge users was facilitated through advisory committee buy-in which was important to successfully accomplishing the activities laid out in the *KT Blueprint*.

Finally, the availability of existing templates to guide our KT planning and project management were critical in meeting ComPARe's goals within the constraints of time and funding.

5.2. Challenges

A well designed iKT approach can be time consuming, as well as require significant human and financial resources to be done well. We experienced a few challenges pertaining to resources.

First, although the KT Node had a dedicated budget, it was difficult to anticipate all costs as these were dependent on an evolving list of knowledge products and dissemination activities, which were prioritized using knowledge user consultations. Therefore, it was important to ensure flexibility in the budget as information on the cost of KT tended to be fluid, and to communicate any changes to the rest of the research team in a timely manner so that funds could be allocated as required to support any newly identified KT efforts.

Secondly, in terms of human capital, for the integrated knowledge users, their role in the ComPARe project was secondary to their primary roles at their respective organizations; roles that made them appropriate knowledge users in the first place. Therefore, it was important for their organization to formally recognize and support their involvement in ComPARe to ensure their continued participation. Similarly, the KT Advisory Committee members were engaged as volunteers, reimbursed only for meeting-related travel.

Third, for all knowledge users, the dual function of knowledge users as organizational representatives posed two challenges to the study: competing priorities and turn-over of members. While turn-over poses certain challenges, in our case it also led to additional and new members joining the study; thereby, enhancing the diversity of input.

Finally, both ComPARe research team members and the KT Advisory Committee members were geographically distanced. This geographical separation further reinforced the need to have regular touchpoints with all stakeholders to ensure their connection to and meaningful engagement in the study. Beyond the monthly ComPARe research team's monthly teleconferences, the investments in face-to-face meetings for the ComPARe research team and the face-to-face workshops with the advisory committee were integral towards this goal.

5.3. Considerations

As per the *KT Blueprint*, the overall iKT approach and corresponding outputs cannot be evaluated until the dissemination plan is complete. Therefore, the full scope of the benefits, enablers and challenges of our approach has yet to be realized. A follow-up publication reporting on the evaluation results will provide a full summary of our KT outputs and associated outcomes, as well as reflections on our iKT approach encompassing the perspectives of a broader group of stakeholders.

5.4. Conclusions

Through an iKT approach, the expertise of the knowledge producers (i.e. cancer prevention researchers) and knowledge users (i.e. end users) was brought together to produce contextually relevant information that is useful to the knowledge users. The *KT Blueprint* provided a systematic and pragmatic approach to inform the KT activities of the study, including the development of a *KT Plan* and an advisory committee. A future evaluation of the KT practices of the ComPARe study is required to determine the effectiveness of the iKT approach and *KT Blueprint* and their impact on the utility of the findings. In the interim, our approach can be modeled by others interested in collaborative, action-oriented research.

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Conflicts of interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ypmed.2019.03.036.

References

Barwick, M.O., 2008. 2013. Knowledge Translation Planning Template. The Hospital for Sick Children, Ontario.

Brenner, D.R., Poirier, A.E., Walter, S.D., King, W.D., Franco, E.L., Demers, P.A., Villeneuve, P.J., Ruan, Y., Khandwala, F., et al., 2018. Estimating the current and future cancer burden in Canada: methodological framework of the Canadian Population Attributable Risk of Cancer (ComPARe) study. BMJ Open 8.

Camden, C., Shikako-Thomas, K., Nguyen, T., Graham, E., Thomas, A., Sprung, J., Morris, C., Russell, D.J., 2015. Engaging stakeholders in rehabilitation research: a scoping review of strategies used in partnerships and evaluation of impacts. Disabil. Rehabil. 37, 1390–1400.

Canadian Cancer Society, 2017. CCS-Partner Prevention Research Grants.

Canadian Institutes of Health Research, 2015. Guide to Knowledge Translation Planning at CIHR: Integrated and End-of-Grant Approaches. Government of Canada, Ottawa.

Canadian Institutes of Health Research, 2016a. About us: Knowledge translation Government of Canada, Ottawa.

Canadian Institutes of Health Research, 2016b. Knolwedge User Engagement. Government of Canada, Ottawa.

Gagliardi, A.R., Berta, W., Kothari, A., Boyko, J., Urquhart, R., 2016. Integrated knowledge translation (IKT) in health care: a scoping review. Implement. Sci. 11, 38.

Gagliardi, A.R., Kothari, A., Graham, I.D., 2017. Research agenda for integrated knowledge translation (IKT) in healthcare: what we know and do not yet know. J. Epidemiol. Community Health 71, 105–106.

Graham, I.D., Tetroe, J., 2007. How to translate health research knowledge into effective healthcare action. Healthc. Q. 10, 20–22.
Graham, I.D., Logan, J., Harrison, M.B., Straus, S.E., Tetroe, J., Caswell, W., Robinson, N., 2006. Lost in knowledge translation: time for a map? J. Contin. Educ. Health Prof. 26, 13–24.
Graham, I.D., Tetroe, J., Pearson, A., 2014. Turning Knowledge into Action: Practical Guidance on how to Do Integrated Knowledge Translation Research. Lippincott Williams & Wilkins.
Graham, I.D., Kothari, A., McCutcheon, C., Integrated Knowledge Translation Network Project Leads, 2018. Moving knowledge into action for more effective practice, programmes and policy: protocol for a research programme on integrated knowledge translation. Implement. Sci. 13, 22.
Kitson, A., Powell K Fau - Hoon, E., Hoon E Fau - Newbury, J., Newbury, J., Fau - Wilson, A., Wilson A Fau - Beilby, J., Beilby, J., 2013. Knowledge Translation within a Population Health Study: How Do you Do it? Implementation Science.
Kothari, A., Wathen, C.N., 2013. A critical second look at integrated knowledge translation. Health Policy 109, 187–191 (Amsterdam, Netherlands).
Kothari, A., Wathen, C.N., 2017. Integrated knowledge translation: digging deeper, moving forward. J. Epidemiol. Community Health 71, 619–623.
McLean, R., Tucker, J., 2013. Evaluation of CIHR's Knowledge Translation Funding Program. Canadian Institutes of Health Research.
Parry, D., Salsberg, J., Macaulay, A.C., 2015. A Guide to Researcher and Knowledge-User Collaboration in Health Research (Canadian Institutes of Health Research). .
Straus, S.E., Tetroe, J., Graham, I., 2009. Defining knowledge translation. Can. Med. Assoc. J. 181, 165–168.