

EXECUTIVE SUMMARY

# CANCER PREVENTION RESEARCH IN CANADA

A STRATEGIC FRAMEWORK  
FOR COLLABORATIVE ACTION



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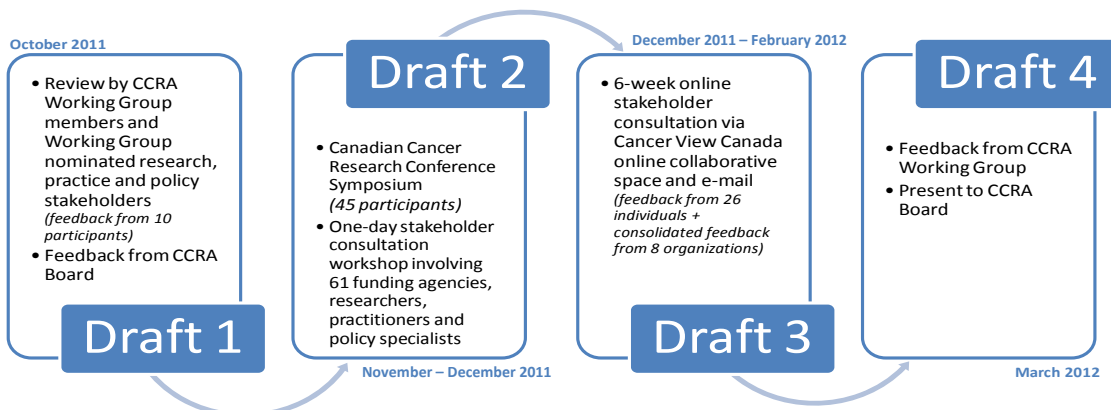
## EXECUTIVE SUMMARY

In May of 2010, the Canadian Cancer Research Alliance (CCRA) published the first ever *Pan-Canadian Cancer Research Strategy*<sup>1</sup> framework report. This overall framework is grounded in the strengths of the Canadian cancer research community and is highly connected to emerging priorities in the international research landscape which will guide cancer research investment in Canada. This strategic framework sets an agenda of new collaborations between research funding agencies and aims to provide a vision for Canadian cancer research achievement over the next five years. The first action item that was proposed in this strategic framework led to the publication of a report<sup>2</sup> on the scope and nature of the investments in cancer risk factor and prevention research in Canada by CCRA member organizations. This then was to serve as the foundation for developing a pan-Canadian cancer prevention research framework to inform future CCRA funding priorities.

*The purpose of this report is to provide a framework for collaborative action on and investment in cancer prevention research in Canada.*

This framework is intended to cover a broad scope of research activities from risk factor identification and reduction through to intervention research, including individual behavior change as well as research to influence evidence-based public health/clinical practices and policies. Figure 1 reflects the multi-stage consultation process informing this report that involved research, practice, and policy experts from across Canada.

**Figure 1: Stakeholder Consultation Process**



The primary audience for this report is cancer research funding organizations working individually and collectively through the Canadian Cancer Research Alliance (CCRA). A secondary audience for the recommended actions in the report is other chronic disease research funders interested in partnering on risk factor reduction and prevention research initiatives focused on common non-communicable disease prevention priorities (e.g., tobacco, obesity, the environment).

The framework identifies needs and articulates opportunities for cancer risk identification and prevention research in Canada. It is expected that individual CCRA member organizations may have an interest in leading, working together with other CCRA members to support, and/or collaborating with research funding agencies focused on other chronic diseases that share many risk factors with cancer (e.g., cardiovascular, diabetes, lung).

<sup>1</sup> [http://www.ccra-acrc.ca/PDF%20Files/Pan-Canadian%20Strategy%202010\\_EN.pdf](http://www.ccra-acrc.ca/PDF%20Files/Pan-Canadian%20Strategy%202010_EN.pdf)

<sup>2</sup> [http://www.ccra-acrc.ca/PDF%20Files/Prev\\_2005-07\\_EN.pdf](http://www.ccra-acrc.ca/PDF%20Files/Prev_2005-07_EN.pdf)

Thus, an anticipated outcome of the review and approval of this report by the CCRA Board includes the launch of new co-funded research funding opportunities in shared cancer prevention research priority areas.

### Implications from Research Funding Review

The detailed May 2010 report<sup>3</sup> of CCRA cancer prevention research investments from 2005-2007 was used to provide a benchmark of cancer prevention and risk reduction research activity in the country and served as a basis for some of the recommendations within the framework. An analysis of these research investment data indicated that cancer epidemiology is a relatively active field in Canada spanning a broad range of risk factors with provincially-based leadership indicated for a number of these known risk factors. The level of etiological investment in infectious agents suggests that this may be a particular area of strength in Canada that can help identify new viral agents and contribute to the development of new vaccines to prevent cancer. Conversely, the extremely low level of investment in alcohol research in Canada is a concern which may warrant further consideration by the CCRA.

Research on genetic susceptibilities (inherited and acquired cancer risk) represented the single largest investment (\$39.5M) among the 15 risk factors examined. Although genetic factors are not generally considered modifiable, understanding population variations in genetic predisposition to developing cancer and/or being affected by lifestyle and environmental/occupational risk factors may provide the foundation for more targeted prevention intervention approaches in the future.

Tobacco accounted for 40% of the total investment in intervention-related research. It has been argued that there is sufficient evidence to demonstrate that significant reductions in new cancer cases could be accomplished through lifestyle modification and population-based approaches to tobacco control. The relatively low level of investment in areas of cancer prevention research other than tobacco control substantiates previously reported research portfolio analyses conducted by the CCRA. Two examples where collective action by CCRA members might help address these funding limitations are in environmental and occupational exposure risk factor identification and risk reduction research and in obesity-related risk factor identification and risk reduction research focused on improved nutrition and increased physical activity.

With respect to environmental and occupational exposures, there was no funding from 2005-2007 for human intervention research and relatively limited funding for identifying new environmental and occupational exposures that may be causes of cancer. Thus, there is an opportunity for CCRA member organizations to expand prevention research funding to discover new environmental and occupational risk factors and develop and test interventions to reduce occupational exposures to carcinogens within the workplace. A multi-agency initiative by CCRA members to address this problem could have a substantial impact on this relatively understudied area, with only a relatively modest commitment of funds. Of note, the Canadian Cancer Society (CCS) and Cancer Care Ontario (CCO), in partnership with the Workplace Safety and Insurance Board (WSIB) have recently expanded their research investments in this area through funding the Occupational Cancer Research Centre (OCRC). CAREX Canada, largely funded by the Partnership, also has extensive surveillance data on environmental and occupational exposures. These provide valuable platforms upon which to build.

Turning to obesity-related research, intervention research funding was the largest category of spending among CCRA member organizations although it only amounted to \$2.7M over the three year period (2005-2007). While there were 18 CCRA member organizations which provided research funding for obesity-related research between 2005 and 2007, the Canadian Institutes for Health Research (CIHR) and CCS alone accounted for 46.8% of the \$9.7M invested. In order to address the growing problem of obesity in Canada, CCRA member

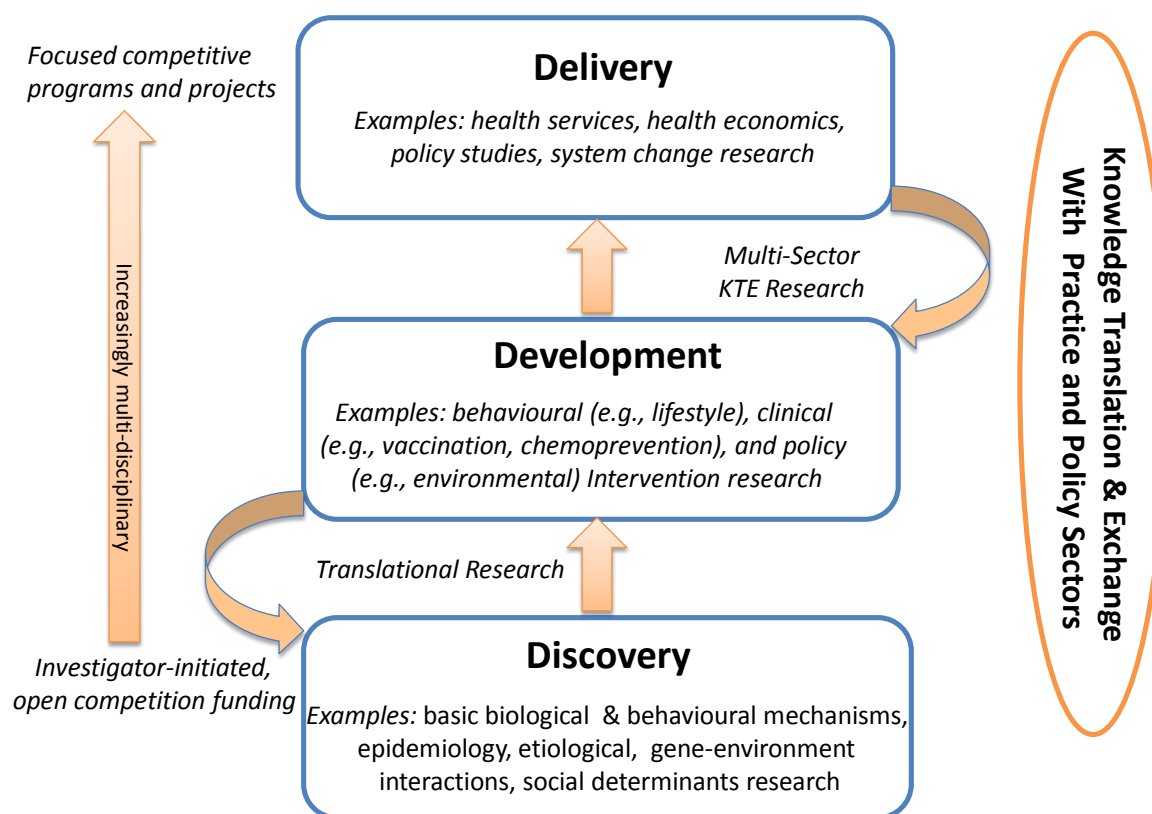
<sup>3</sup> [http://www.ccra-acrc.ca/PDF%20Files/Prev\\_2005-07\\_EN.pdf](http://www.ccra-acrc.ca/PDF%20Files/Prev_2005-07_EN.pdf)

organizations could consider substantially increasing translational and intervention research investments and actively seek co-funding opportunities with non-cancer research funding agencies (e.g., Heart and Stroke Foundation, Canadian Diabetes Association) to leverage cancer-specific research funding with other chronic disease research funding agencies interested in reducing obesity and its deleterious health effects.

The 2005-2007 CCRA investment survey data<sup>4</sup> suggest a significant barrier to progress may be limited research capacity due to the relatively small number of scientists engaged in cancer prevention research in Canada, particularly in intervention research. The importance of cancer risk reduction and prevention research is being recognized by Canadian cancer research funders and building scientific capacity in these gap areas is an overarching priority. In light of recent strategic investments in cancer prevention research by some CCRA member organizations, building prevention research capacity across Canada to take advantage of these new funding opportunities will be critical for their success. Future trend analyses of CCRA funding data will provide a valuable means to monitor the amounts and patterns of investment in this area.

A conceptual model for putting cancer prevention and risk research investment priorities in context is provided in Figure 2.

**Figure 2: Prevention and Risk Research Strategic Funding Paradigm**



This graphical description displays the progression of research from basic discovery through intervention development to health services delivery research. As research moves from a foundation of discovery research to the study of the implementation of findings on population and health systems levels, the funding opportunities become proportionally less 'open' and increasingly focused, as well as increasingly multi-disciplinary. The

<sup>4</sup> [http://www.ccra-acrc.ca/PDF%20Files/Prev\\_2005-07\\_EN.pdf](http://www.ccra-acrc.ca/PDF%20Files/Prev_2005-07_EN.pdf)

proportion of investigator-initiated research evaluated through open competitions versus more focused research investments will differ in particular research topic areas and for different risk factors depending on the level of discovery, development and delivery research completed and synthesized to date. In more mature areas of study in which there has been significant investment in discovery and intervention development research, a higher proportion of strategic investments in delivery research may be warranted (e.g., tobacco control). Conversely, where the bulk of the research investments to date have been in discovery, and where the translational potential remains elusive, continued investments in investigator-initiated discovery and development research may be more appropriate.

However, as the translational research and KTE research arrows suggest, research evidence generated in any part of this research paradigm could and should inform resulting research questions, and investigator-initiated research should always be considered an important resource for the generation of new knowledge. For example, natural experiments and “real world” observational research may raise new questions that need to be investigated in “back to basics” discovery research. Knowledge translation and exchange is a critical activity throughout all phases of research and research funding priorities can and should be influenced in part by observations from the public health and clinical practice and policy communities.

One issue of concern raised during the framework consultation process, particularly among basic and etiological researchers, was the perceived trend that the proportion of research supported through open competitions relative to more focused investments by CCRA member organizations has been declining. Across the continuum of discovery, development and delivery research, open investigator-initiated grant opportunities are more frequently used for basic science and observational discovery research studies, with intervention (development), implementation and health services research (delivery) usually seeing a higher proportion of focused funding mechanisms (e.g., topic targeted requests for applications).

The CCRA investment data from 2007-2009<sup>5</sup> indicate that while overall research dollars have grown by 27.4%, more focused research investments have only grown by 18.6%. Open competition funding for biology (31.5%), etiology (41.2%), early detection, diagnosis and prognosis (54.1%), and treatment (31.7%) have all grown more during the same time period. Only open competition funding for prevention intervention research (17.1%) and cancer control, survivorship, and outcomes research (13.0%) have grown by a lower percentage than the overall growth in more focused investments.

It should be noted that this concern regarding an appropriate balance between open and more focused funding extends beyond prevention and risk factor identification and reduction research across the cancer control continuum. As cancer research activities grow and evolve in Canada, more recent investment data will enable the CCRA to continue to monitor this important funding balance issue. The extent to which the collective investment by CCRA member organizations across the discovery, development, and delivery continuum is appropriate may be best understood in the context of the knowledge gained and the lessons learned from the research completed to date. Thus, the determination of an appropriate balance for different areas of research will depend in part on the ability to synthesize the emerging science.

### Implications from Literature Reviews

There are a number of different sources that provide reviews of research evidence, including the peer-reviewed literature as well as organizational and expert opinion documents that make up what is often termed the grey literature. The number of reviews in the peer-reviewed literature alone is large and growing. For example, a

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<sup>5</sup> Based on analysis of recent data (unpublished) from the Canadian Cancer Research Survey



simple search of the U.S. National Library of Medicine Pub Med website<sup>6</sup> using the search terms ‘cancer prevention research’ yielded 10,240 review article citations dating back to 1970.

There are also well-recognized international and national organizations that lead the way in contributing to the systematic review of the research literature in general and the cancer research literature in particular. These include the WHO International Agency for Research on Cancer (IARC) monographs on the evaluation of carcinogenic risks to humans,<sup>7</sup> the Cochrane library,<sup>8</sup> The Canadian Task Force on Preventive Healthcare,<sup>9</sup> The UK National Institute for Health and Clinical Excellence,<sup>10</sup> The US Preventive Services Task Force,<sup>11</sup> and the US Community Preventive Services Task Force<sup>12</sup>. All of these groups conduct regular reviews of the scientific literature and publish, update, and disseminate their findings and recommendations on a regular basis. While much of this work focuses on the practice and policy implications of the research reviews, a portion of some reviews is also devoted to elucidating research issues that remain to be addressed.

Recognizing that a systematic review of all the published documents, in addition to the many and varied grey literature documents, was beyond the scope and resources of this strategic framework development effort, the Canadian Partnership Against Cancer with its CCRA working group partners supported and worked with the Propel Centre for Population Health Impact at the University of Waterloo and the Canadian Cochrane Centre at the University of Ottawa to conduct a review of four sets of documents focusing on research issues or questions that need to be addressed in the future:

1. selected published and unpublished research strategy reports related to cancer risks and prevention (University of Waterloo)
2. cancer prevention relevant systematic reviews in the Cochrane Library (University of Ottawa)
3. cancer prevention relevant reviews in the Guide to Community Preventive Services (the Partnership)
4. cancer prevention research relevant policy documents in the Prevention Policies Directory (the Partnership).<sup>13</sup>

A number of potentially important research issues and questions were identified by this exercise and are described in the full report. However, while the effort to consider this information was appreciated by many of the reviewers of the earlier report drafts, particularly among the practice and policy reviewers, a number of research reviewers in the consultation process raised serious concerns about the inherent bias introduced by variable approaches to document identification and inclusion in the aforementioned review efforts. For example, almost all the documents reviewed focused on development or delivery related research issues and as such were largely silent on the important discovery research questions that remain to be addressed. Had it been possible to systematically review the over 100 WHO IARC monographs on the evaluation of carcinogenic risks to humans, more discovery relevant research funding recommendations would no doubt have been identified.

A key recommendation in the framework that addresses the limitation of any ad hoc literature review process is that shared support by CCRA members should be garnered for cancer prevention research-focused knowledge synthesis efforts in order to conduct systematic reviews of risk factor and cancer prevention research review reports to inform future collectively funded request for proposals (RFPs). In this regard, there are a number of

<sup>6</sup> <http://www.ncbi.nlm.nih.gov/pubmed> (accessed February, 2012)

<sup>7</sup> <http://www.iarc.fr/en/publications/list/monographs/> (accessed February, 2012)

<sup>8</sup> <http://www.thecochranelibrary.com/view/0/index.html> (accessed September, 2011)

<sup>9</sup> <http://www.canadiantaskforce.ca/> (accessed February, 2012)

<sup>10</sup> <http://www.nice.org.uk/> (accessed February, 2012)

<sup>11</sup> <http://www.uspreventiveservicestaskforce.org/index.html> (accessed February, 2012)

<sup>12</sup> <http://www.thecommunityguide.org/index.html> (accessed November 2011)

<sup>13</sup> <http://www.cancerview.ca/cv/portal/Home/PreventionAndScreening/PSProfessionals/PSPrevention/PreventionPoliciesDirectory> (accessed December 2011)

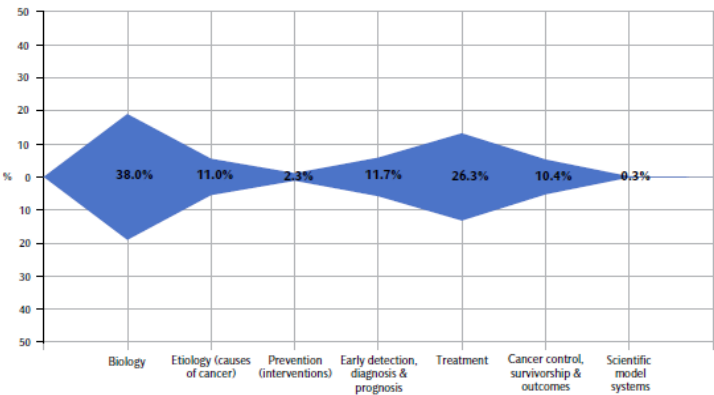


centres of knowledge synthesis excellence in Canada that could respond to RFPs to the CCRA to carry out such work on a timely and effective basis. This could dramatically increase the level of knowledge applied to the development of future cancer prevention research RFPs, and could help inform prevention research adjudication panels with the most up to date syntheses of findings relevant to the research proposals being reviewed. Moreover, once developed and evaluated, such an operation could be expanded to carry out similar knowledge synthesis efforts across the cancer control research continuum.

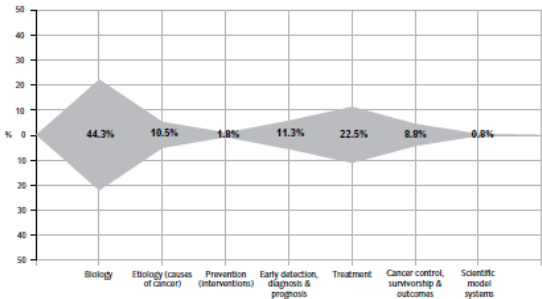
Where is Canada Taking the Lead in Cancer Prevention Research?

As can be seen from Figure 3 below, published in the most recent CCRA cancer research strategy investment report<sup>14</sup>, there has been an 8.3% increase in the total cancer research investments by CCRA members from 2007 to 2008, while there has been a 6.3 % relative percentage decrease in basic science biology investments in the same time period (a reduction of just under \$13M from 2007 to 2008).

FIGURE 3 DISTRIBUTION OF 2008 CANCER RESEARCH INVESTMENT BY CSO CATEGORY (\$446.2M)



DISTRIBUTION OF 2007 CANCER RESEARCH INVESTMENT BY CSO CATEGORY (\$412.0M)



While this reduction in basic science investments may reflect a change in priorities among some CCRA member organizations, basic science followed by treatment-related research remain the two largest areas for cancer research investment in Canada. Compared with the overall growth observed for cancer research funding, the relatively small 1% increase in the combination of etiological and prevention intervention research from 2007 to 2008 highlights the importance of reviewing where Canada’s risk factor identification and prevention research investments are being made and how both scientific opportunity and prevention practice and policy needs may inform prevention research priorities in the future. The importance of increased investment in cancer prevention and risk reduction research has been recognized by several CCRA member organizations, and

<sup>14</sup> Canadian Cancer Research Alliance (2011). *Cancer Research Investment in Canada, 2008: The Canadian Cancer Research Alliance’s Survey of Government and Voluntary Sector Investment in Cancer Research in 2008*. Toronto: CCRA. (Figure 3.2.1, page 20)

examples of more current strategic investments not captured in the most recently available CCRA funding data are described in Appendix 1.

As previously noted, the cancer risk/causation component of Canada's cancer prevention research investments is relatively large. However, CCRA funding for genetic research accounts for a much larger share than the combined investments in lifestyle (e.g., alcohol use) and occupational/environmental risk factors. There are also significant opportunities to link basic science with population-based biomarker identification and molecular epidemiology. The multi-jurisdictional Canadian Partnership for Tomorrow Project represents an example of a collective investment where CCRA member organizations pooling resources can lead to a dramatic increase in our knowledge about cancer and other chronic disease risk factors.

Within Canada, there are prevention research capacity issues and recent CCRA data on the number and location of prevention scientists has revealed that there are very few researchers engaged in prevention research generally, and in intervention research specifically. Expanded capacity building resources should be considered by research funders to increase the field of qualified investigators in cancer prevention, risk reduction and intervention research. Above and beyond increased investments in training grants or nodes of research expertise, one model that may be worth examining to quickly attract new scientists into the field of cancer prevention research is the U.S. NIH career development K-awards.<sup>15</sup> With respect to cancer prevention research, the NIH's National Cancer Institute has made and continues to make a significant investment in K-07<sup>16</sup> five-year career development awards, which include significant salary support for research as well as training and travel funds. These investments led to significant growth in the number of cancer prevention and population scientists in the U.S.

With respect to risk factor reduction and cancer prevention intervention research, a number of research recommendation documents and systematic reviews highlighted the dearth of cost data for interventions being collected as well as little or no cost effectiveness analyses in the intervention research conducted and published in the peer-reviewed literature. From the perspective of practice and policy, the absence of such data may make the decision to adapt or adopt a research-tested cancer prevention intervention more difficult. Program resources for health promotion and disease prevention in Canada are very limited in comparison to healthcare services for those who are already diagnosed with a disease. As such, CCRA member organizations that develop and disseminate RFPs for cancer prevention intervention research should consider including a requirement for the collection and analysis of intervention implementation cost data in relation to intervention effectiveness data. This may be particularly important in natural experiments, where the context in which a program or policy is being implemented may have profound cost implications for other jurisdictions considering a similar approach.

Research priorities for knowledge translation and exchange (KTE) research were under-developed from the documents reviewed and there was very limited risk factor or cancer prevention research funding focused on these topics. Given that these areas are critical to integrating the lessons learned from research with the lessons learned from policy and practice, and were identified as high priorities in many of the policy documents reviewed, another opportunity for collective CCRA research investment is in KTE research training and the support of pilot studies in this area. This would increase the number of Canadian cancer prevention researchers who may become interested in and capable of successfully competing for existing KTE research funding mechanisms both from Canada (CIHR) and the U.S. (NIH).

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<sup>15</sup> <http://grants.nih.gov/training/careerdevelopmentawards.htm>

<sup>16</sup> <http://grants.nih.gov/grants/guide/pa-files/PA-09-078.html>

Finally, given the diversity of populations and the variation in risk factors and disease burden across Canada, both research recommendation/policy documents and systematic reviews identified research to help reduce cancer health disparities as high priorities. However, there are three conundrums that CCRA member organizations will need to consider should they choose to increase research investment in this important area. First and foremost is the role that social determinants play as “upstream” conditions that contribute greatly to health disparities across many diseases, including cancer. Given that many of these social determinants are endemic and, if modifiable, will only be changed looking outside of a health lens, it’s often difficult to address health disparities through a disease-specific research funding initiative.

Second, many vulnerable populations and underserved communities that have experienced cancer and other health disparities are reluctant to participate in research. From their perspective, research often represents simply another effort to “describe” what has been known to them for generations rather than studying how to “address” the problems. Research through the lenses of discrimination and deprivation may be viewed as exploitative rather than supportive. Should CCRA member organizations choose to invest in health disparities research, they should carefully examine the lessons learned from community-based participatory research approaches<sup>17</sup> to better understand how to constructively engage those populations and communities being studied, and how best to share research design, analysis, and knowledge exchange responsibility and authority with the leaders of those communities in which the research is conducted.

Third, the cultural and socioeconomic diversity of underserved communities often moves research and practice into the development, delivery, and evaluation of targeted interventions tailored to the particular needs and circumstances of specific vulnerable populations. From a research perspective, it’s often difficult to generalize the lessons learned from these community-specific intervention studies. Even communities that share the same cultural heritage or socio-economic conditions may view the research findings as not relevant their particular community needs. From a program and practice perspective, the resources needed to implement multiple intervention programs and policies tailored to each community’s needs may be beyond the resources available for disease prevention and health promotion. The CCRA member organizations and other non-communicable disease research funders with program and policy arms (e.g., health charities) should explore sharing best practices and results in rigorous program evaluation of community-specific practice and policy interventions. This will help increase our knowledge base of what works for whom without trying to sort this out solely through the lens of intervention research.

### Recommendations for Key CCRA Prevention Research Funding Priorities

The following recommendations represent the 10 highest priorities for prevention and risk research in Canada based on current strengths, gaps, and opportunities for coordination and collaboration among CCRA member organizations. They are presented in order of infrastructure, discovery, development and delivery research investment opportunities and, as such do not imply any funding priority order.

1. CCRA member organizations should individually and/or collectively support initiatives that will build capacity in gap areas of cancer prevention and risk reduction research including multi-disciplinary intervention development, KTE and health services delivery research. These initiatives may include training awards, mentorships, deliberate networks, nodes of expertise, career awards or other funding mechanisms to encourage existing researchers in Canada to apply their research acumen to cancer prevention. The success of these capacity building initiatives will result in an increase in the pool of excellent Canadian investigators in these under-represented fields who can successfully compete for both open competition and more focused investment RFPs.

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<sup>17</sup> Israel, B. A., Eng, E., Shulz, A. J., & Parker, E. A. (Eds.). (2005). *Methods in Community Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass.

2. With respect to expanding prevention research infrastructures, CCRA member organizations should work together to: a) network existing centres of excellence in risk factor and prevention related research across Canada to increase knowledge exchange across disciplines, sectors and jurisdictions, and b) expand investments in new centres of excellence in cancer risk factor and prevention research, particularly in jurisdictions where additional research expertise can expand the effectiveness of cancer prevention practice and policy initiatives.
3. A number of CCRA member organizations are heavily invested in investigator-initiated, open-competition discovery research, recognizing it as the foundation upon which intervention development and service delivery research are based. Where more focused investments in development and delivery research are needed, this growth should not lead to a decline in funding dollars for the critical foundation of discovery research.
4. Where substantial investments have and continue to be made in discovery research areas (e.g., genomics and cancer) CCRA organizations funding this research should take advantage of the opportunities for working together to provide strategic funding to explore the translational potential of discovery research to inform new prevention intervention development and testing.
5. Where evidence-based prevention interventions have shown limited impact on specific high-risk populations (e.g., heavy smokers), collaborative and targeted funding for multi-disciplinary discovery research should be increased to elucidate the mechanisms by which some people and populations benefit from evidence-based interventions and others do not.
6. The collective investment in prevention intervention development and testing research should be increased, particularly in areas where the population attributable benefit of reducing the risk factor (e.g., tobacco, obesity) and/or the prevalence of risk factors (occupational and environmental exposures) remains high. Common risk factor intervention research studies also provide a significant opportunity for CCRA members to leverage their funding with other non-communicable disease research funders and benefit the field through collaborative investments.
7. Health economics research and the routine collection of cost data should be considered a very high priority in all future intervention development and delivery research strategic investments.
8. CCRA member organizations should share resources to strategically fund ongoing knowledge synthesis efforts of published systematic reviews and unpublished research strategy reports to inform the development and the adjudication of future cancer risk identification and reduction RFPs. The CCRA secretariat should coordinate this shared investment initiative.
9. CCRA member organizations with at least two mission priorities of research, practice and policy should evaluate and share best practices for integrating development and delivery research (e.g., natural experiments, cancer health services research) with evidence-informed program implementation and policy change work.
10. For complex cancer prevention and control issues where endemic societal determinants play an overarching role (e.g., health disparities among culturally diverse and underserved populations), CCRA members should co-invest with government and non-government agencies in rigorous program and policy evaluation, linked with KTE research, to inform future research funding opportunities and program/policy actions.

It should be noted that increased investments in prevention intervention development research carry with it some special issues that may have contributed to the relatively low levels of past funding in Canada and will need to be considered as new intervention development research initiatives are planned in the future. The first is that, for comparative studies testing an intervention to reduce cancer cases, large numbers of subjects are required and long follow-up needed before answers are obtained. Thus, these types of trials can be quite costly, require multiple participating investigators and institutions, as well as involving a substantial infrastructure to manage. While the use of intermediate or surrogate endpoints (such as reduction in precancerous lesions or reduction in risk factor measures) can address problems of sample size, cost and time to complete studies, these approaches have their own complexities.

The second issue centres on studies where interventions are intended to modify the process of carcinogenesis and are evaluated by measuring intermediate pathological endpoints (such as the development of pre-neoplastic lesions like polyps). Here the challenge is whether the endpoint chosen is a necessary step in carcinogenesis or whether other pathways and steps can bypass it. If the former, its reduction should lead to reduction in invasive cancers; if the latter, its reduction may not have the anticipated impact on invasive cases. These methodological issues have made the field of prevention intervention research both challenging and complex, and initiatives in this area will need to include funding on methodological improvements in research design and endpoint specification.

Finally, the complexity of cancer prevention intervention research (e.g., outcomes measurement and multi-factorial designs) combined with the diversity of populations and service delivery contexts in which cancer and chronic disease prevention programs are targeted highlight the importance of building research, practice, and policy partnerships. This applies not only to the use of cancer and chronic disease prevention research knowledge (KTE), but also to the importance of the practice and policy communities working with research funders and scientists to help identify the highest priorities and opportunities for future cancer prevention research in Canada.

## The Path Forward

This report was prepared for all CCRA organizations by a working group of representatives of several CCRA member agencies in response to Action Item #1 of the 2010 Pan-Canadian Cancer Research Strategy.<sup>18</sup> The well documented observation that levels of funding for cancer prevention research in Canada have been and remain low relative to other areas of research led to the recommendation that a comprehensive review of cancer prevention research in Canada should be documented followed by a multi-agency effort to develop a cancer prevention research strategic agenda for Canada.

To solicit specific organizational interest and commitments to follow-up with the collective funding recommendations described herein, the CCRA should agree to sponsor a meeting in 2012 of CCRA member organizations interested in playing a leadership role and/or serving as funding partners. This should then lead to new collaborative RFPs beginning in 2013. In addition, in order to ensure continued relevance of the proposed framework for future cancer risk factor and prevention research funding in Canada, a regular review and update of this framework report, including an analysis of progress against the above priorities and funding trend data, should be conducted with support from the CCRA and should be presented at each biennial Canadian Cancer Research Conference beginning in 2013.

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<sup>18</sup> [http://www.ccra-acrc.ca/PDF%20Files/Pan-Canadian%20Strategy%202010\\_EN.pdf](http://www.ccra-acrc.ca/PDF%20Files/Pan-Canadian%20Strategy%202010_EN.pdf)

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