# INVESTMENT IN CANCER RISK AND PREVENTION RESEARCH, 2005–2014

## HIGHLIGHTS

- During the ten-year period, there was a total of $581M invested in cancer risk and prevention research, which represented 12% of the overall cancer research investment. Much of the increased investment from targeted programs starting in the mid-decade was attributable to the investment made by the Canadian Partnership Against Cancer and provincial organizations in the Canadian Partnership for Tomorrow Project.
- On a per capita basis, there was a slight rise in the investment from 2005–2009 to 2010– 2014. More investment flowed to researchers in the provinces of Alberta, Nova Scotia, and British Columbia in the latter period.
- Ten organizations accounted for 74% of the investment in cancer risk and prevention research over the ten years. The Canadian Institutes of Health Research had the highest investment each year and accounted for 29% of the cumulative investment and the Canadian Cancer Society (CCS) had the second highest cumulative investment, accounting for 11% of the cumulative investment.
- There was virtually no change in the distribution of the investment by cancer site from year to year. Four cancer sites—breast, colorectal, lung and cervix—accounted for nearly sixty percent of the site-specific investment.
- There were changes in terms of the investment by risk factor and focus from the first to second quinquennial. The increase in intervention research funding was the most pronounced trend, with $32M more being invested in intervention research in 2010–2014 than 2005–2009.
- The number of PIs who had funding at some point in the last two years (N=277) was used as a proxy of current researcher capacity and 109 (39%) were funded for projects that involved intervention research.
- The strategic framework for cancer prevention research published by CCRA in 2012 made a call for additional investment, particularly in the areas of intervention research and capacity building. These continue to be priorities in CCRA's current strategic plan. The data presented herein suggest that progress has been made in terms of increased intervention research, but challenges continue on the capacity side. The investment in cancer risk and prevention research will continue to be tracked.

CCRA ACRC

Canadian Cancer Research Alliance • Alliance canadienne pour la recherche sur le cancer

We are an alliance of organizations that collectively fund most of the cancer research conducted in Canada – research that will lead to better ways to prevent, diagnose, and treat cancer and improve survivor outcomes. Our members include federal research funding programs/agencies, provincial research agencies, provincial cancer care agencies, cancer charities, and other voluntary associations.

We are motivated by the belief that, through effective collaboration, Canadian cancer research funding organizations can maximize their collective impact on cancer control and accelerate discovery for the ultimate benefit of Canadians affected by cancer.

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Primary cancer prevention is a critical component to stemming the rise in the number of cancers anticipated in the coming decades, largely due to the aging of the Canadian population, and is vital to lowering the associated personal, social and economic costs of cancer. On the basis of present knowledge, between a third and a half of cancers are preventable. Understanding the risk factors associated with cancer is important to the development of strategies to prevent cancer. While much is known about how to prevent cancer, research is needed to develop and test effective interventions at the system, organizational, and individual levels.

This summary report describes the trend in investment in cancer risk and prevention research in Canada for the decade 2005 to 2014. It updates a previous publication that covered the period 2005 to 2010. Data come from the Canadian Cancer Research Survey (CCRS). The CCRS was designed to help inform CCRA members on how to optimize their research investment by addressing gaps, capitalizing on opportunities to partner on funding, and reducing duplication.

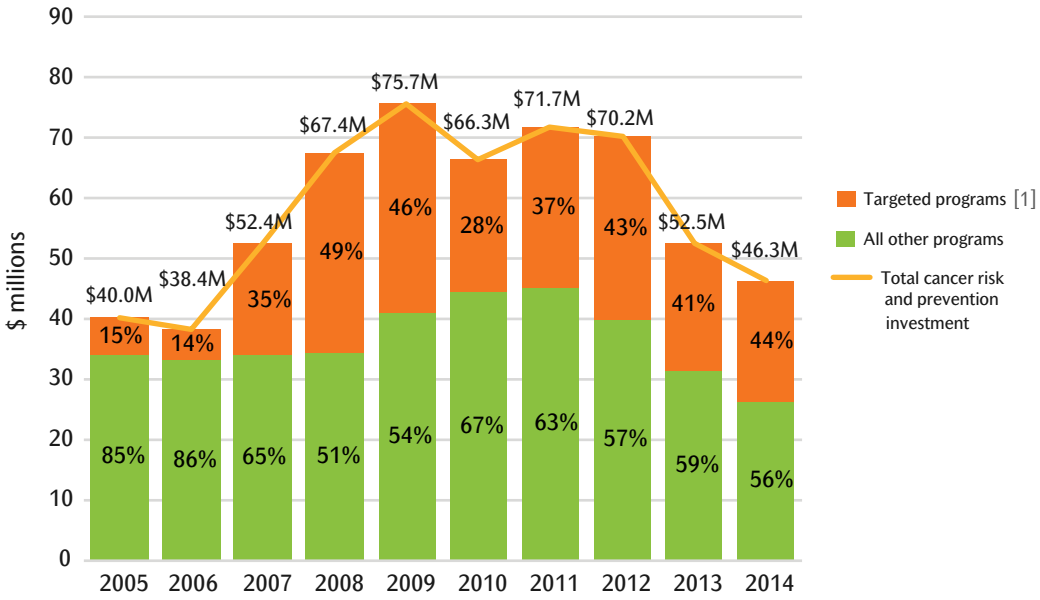
This report was made possible by the Canadian Partnership Against Cancer, an independent, not-for-profit organization funded to accelerate action on cancer control for all Canadians. The Partnership is committed to enhancing the cancer research environment in Canada through its support of the CCRA and CCRA's role in coordinating the cancer research funding system. As a member and funder of the CCRA, the Partnership collaborates with other member organizations to enable the strategy for cancer research in Canada. The Partnership is funded by Health Canada.

The views expressed herein are those of the CCRA.

CANADIAN PARTNERSHIP AGAINST CANCER
PARTENARIAT CANADIEN CONTRE LE CANCER

FIGURE 1

CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY PROGRAM FOCUS, 2005–2014



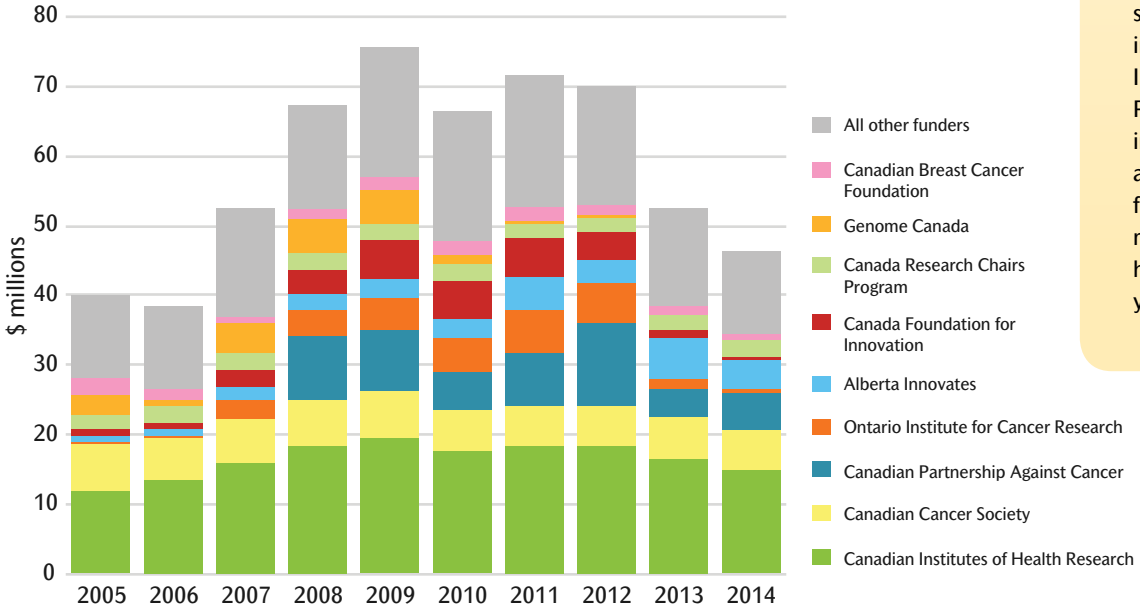

[1] Funding programs specifically designed for prevention, health promotion, and population health research and/or programs that are targeted to specific risk factors.

## DIMENSIONS OF THE CANCER RISK AND PREVENTION CUBE

- 15 risk factors
- three research foci: causes, determinants and interventions
- five research types: research involving model systems, human research, methodological measurements research, knowledge synthesis, and infrastructure and other support

FIGURE 2

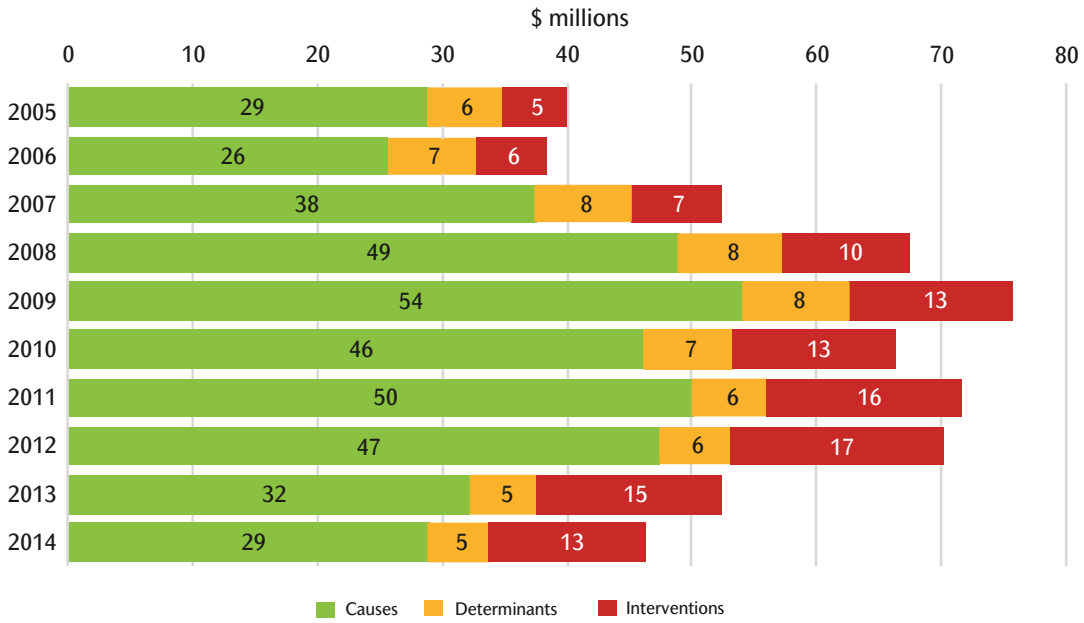
CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY FUNDERS, 2005–2014




- There were 2,587 projects and a total of $580.8M invested in cancer risk and prevention research over the decade. This represented 12% of the overall cancer research investment. The mid-decade bulge in targeted investments was largely attributable to the investment in the Canadian Partnership for Tomorrow (CPTP) Project by the Canadian Partnership Against Cancer and provincial partners (Figure 1). The CPTP investment formed 23% of the overall cancer risk and prevention research investment. Excluding targeted programs, the investment trend for other programs was similar to the overall cancer research investment trend with the maximum investments being made in the 2009 to 2011 period.
- Of the 42 organizations tracked in the survey, 37 had some investment over the decade. Ten organizations accounted for 74% of the investment (Figure 2). The Canadian Institutes of Health Research (CIHR) had the highest cumulative investment at $165.7M (29%) and the Canadian Cancer Society (CCS) had the second highest cumulative investment at $61.5M (11%). Investments by the Canadian Partnership Against Cancer's investment (described above) and the Canada Foundation for Innovation contributed most substantively to the higher investment levels in years 2008 to 2012.

FIGURE 3

CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY FOCUS, 2005–2014




**Causes:** Research that attempts to identify causes of cancer, factors associated with cancer risks, and possible mechanisms/modulators involved in carcinogenesis.

**Determinants:** Research on attitudes, behaviours, and genetic and societal factors that may influence adoption and maintenance of behaviours involved in cancer causation and risk reduction or that may influence the efficacy of risk reduction and cancer prevention strategies.

**Interventions:** Research that seeks to identify, develop, and test/evaluate interventions that may prevent cancer, including: behavioural change approaches, social, environmental, and regulatory changes, agents/drugs, nutraceuticals, and vaccines, prophylactic surgery and screening for precursor lesions/causal viruses.

- The investment in intervention research rose over the decade (Figure 3), with $31.6M more being invested in 2010–2014 than 2005–2009. Much of this increase was due to increased investment in infrastructure and other support in the Multiple/General risk factor, with one particularly large project administered by the Canada Foundation for Innovation contributing to this investment.
- The site-specific investment represented 60% of the cancer risk and prevention investment. The distribution by cancer site changed very little from year to year. Four cancer sites—breast, colorectal, lung and cervical—accounted for 58% of the site-specific investment (Figure 4).

FIGURE 4

DISTRIBUTION OF THE TEN-YEAR CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY CANCER SITE, 2005–2014

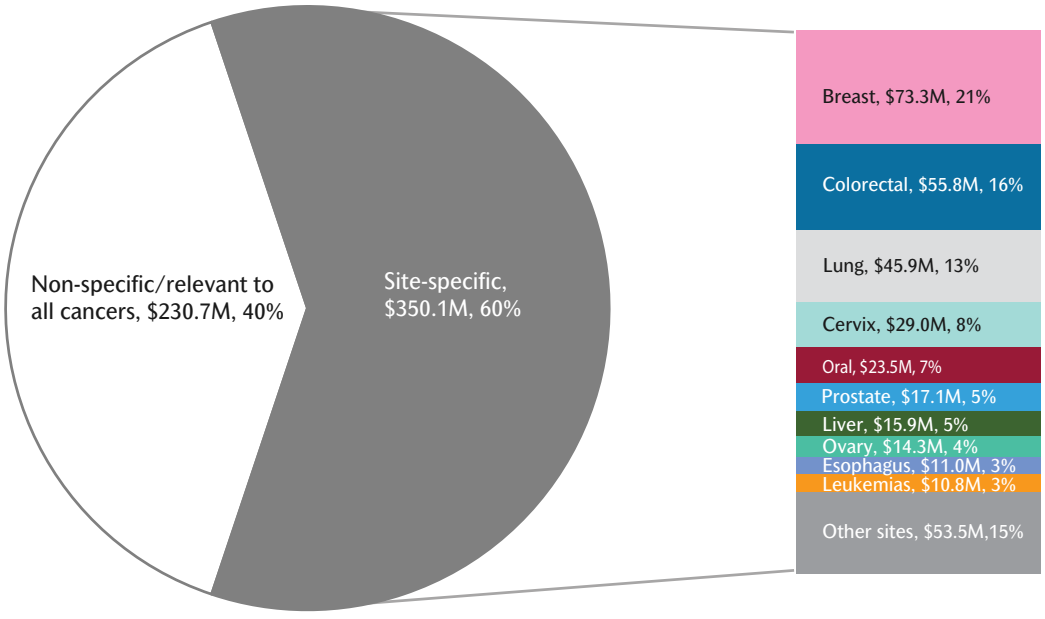
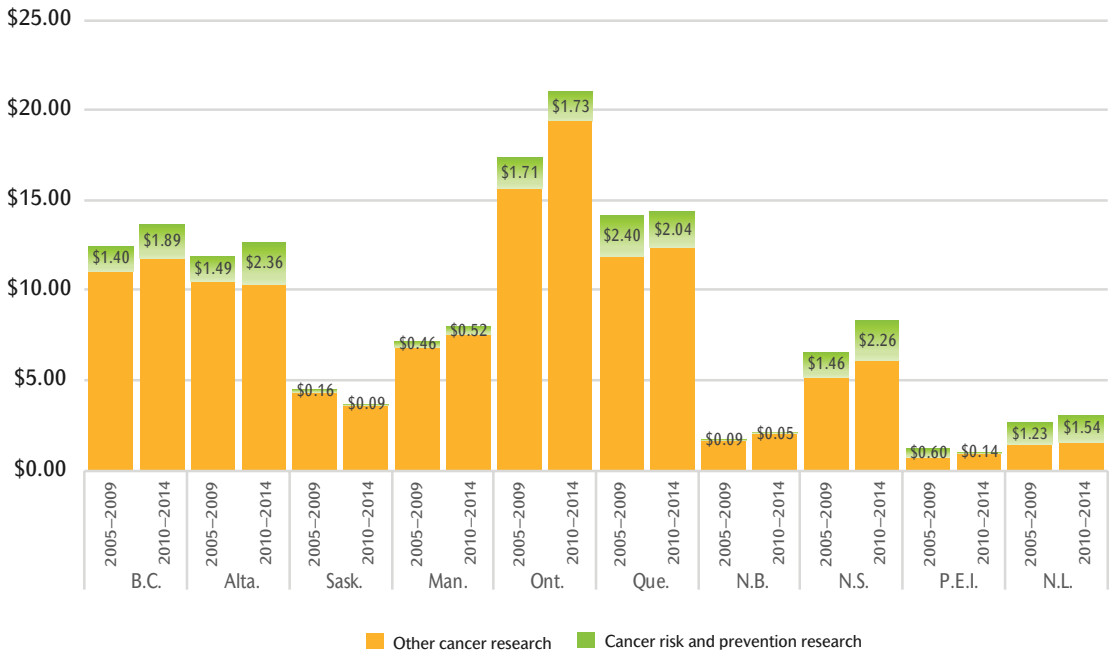


FIGURE 5

**PER CAPITA CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY PROVINCE OF NOMINATED PRINCIPAL INVESTIGATOR, 2005–2009 AND 2010–2014**




- Per capita investment in cancer risk and prevention research was $1.76 in 2010–2014, up from $1.65 in 2005–2009. Per capita investments per province were highly variable, but rose from the first to the second quinquennial for Alberta, Nova Scotia, and, to a lesser extent, British Columbia (Figure 5).
- Cancer risk and prevention research formed nearly one quarter of the overall investment in cancer research flowing to researchers in Alberta in the 2010–2014 period.

- The change in the investment in terms of the risk factors and focus of the research within those risk factors was variable (Figure 6). The risk factors, Multiple/General, Genetic Susceptibilities, Infectious Agents, and Tobacco accounted for 72% of the investment in cancer risk and prevention research over the decade. The most notable trend was the increased investment in intervention research from the first to second quinquennial, particularly for Multiple/General ($10.9M more), Activity Level, Body Composition & Metabolism ($5.2M more) Infectious Agents ($3.7M more), Tobacco ($3.5M more), and Diet & Nutrition ($2.1M more).

FIGURE 6

**CANCER RISK AND PREVENTION RESEARCH INVESTMENT BY RISK FACTOR AND FOCUS, 2005–2009 AND 2010–2014**

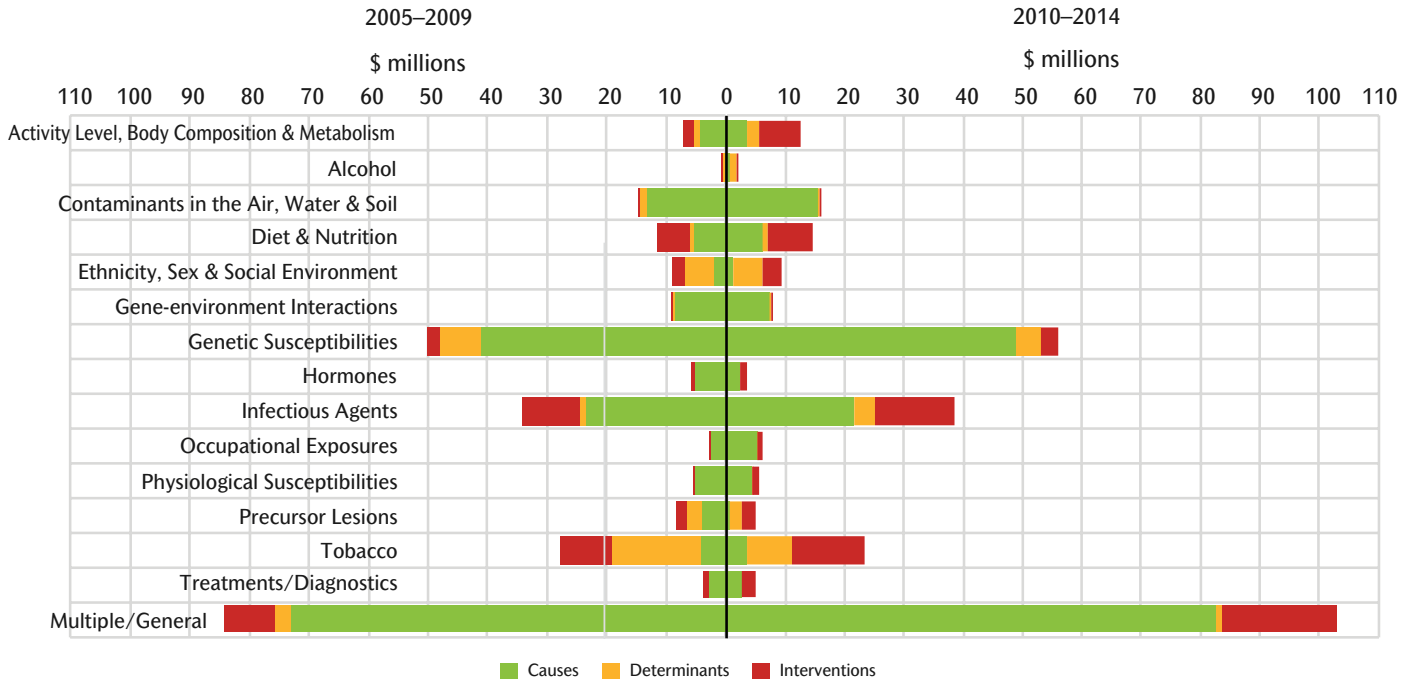
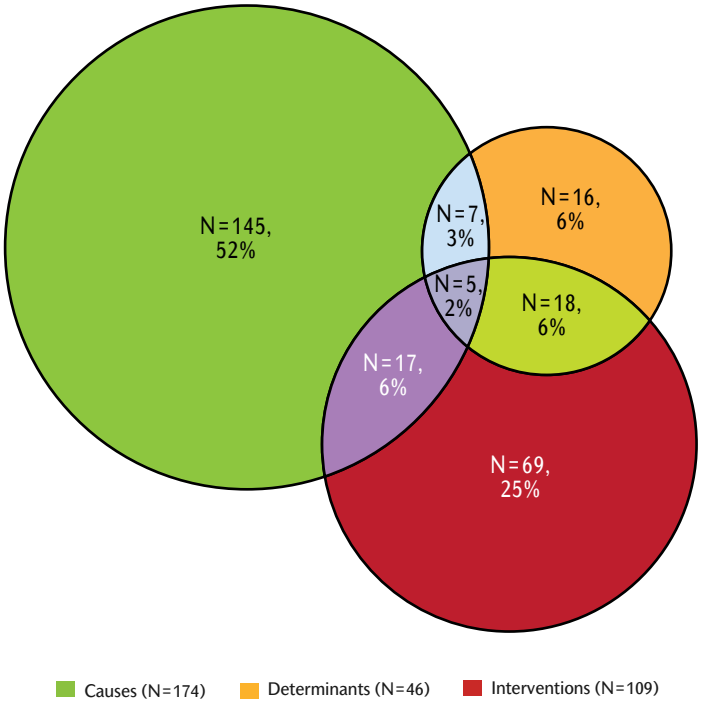


FIGURE 7

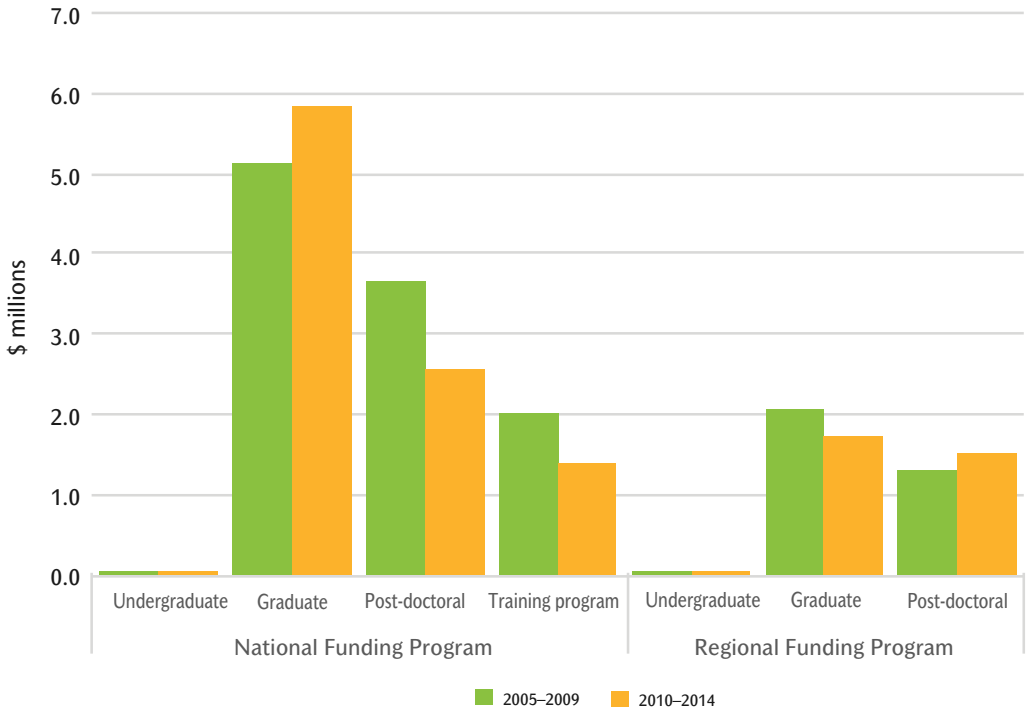
**NUMBER OF NOMINATED PRINCIPAL INVESTIGATORS (N=277) [1] BY RESEARCH FOCUS [2]**




[1] Number of PIs with funding in years 2013 and/or 2014 by research focus.
[2] Numbers and percentages shown apply to the specific parts of the Venn diagram and sum to 277 or 100%.

FIGURE 8

**CANCER RISK AND PREVENTION RESEARCH INVESTMENT IN TRAINEE AWARDS, 2005–2009 AND 2010–2014**




- There were a total of 544 nominated, non-trainee principal investigators (PIs) funded for cancer risk and prevention projects in the decade. This refers to researchers who were nominated PIs for at least one operating grant, equipment award, or career award that had a cancer prevention weighting of 50% or higher. Of these researchers, 249 were funded in both 2005–2009 and 2010–2014. This group represented 46% of the PIs, but accounted for 77% of the cancer risk and prevention investment in 2005–2009 and 74% of the investment in 2010–2014.
- The number of PIs who had funding at some point in the last two years (N=277) was used as a proxy of current researcher capacity. Most worked in the areas of genetic susceptibilities, infectious agents, diet and nutrition, and tobacco and 109 (39%) were funded for projects that involved intervention research (Figure 7).
- Over the decade, a total of 442 trainees received awards for projects with a cancer relevance of 50% or higher. Of these, 28 (6%) went on to receive one or more operating grant, equipment/ infrastructure grant, or career award within the decade. There was an 8% reduction in the investment in trainee awards from the first to the second period and this was largely due to a $1.1M reduction in post-doctoral awards through national funding programs (Figure 8).

# Our Members

Alberta Cancer Foundation

Alberta Innovates

Brain Tumour Foundation of Canada

Breast Cancer Society of Canada

BC Cancer Agency

C[17] Research Network

Canadian Association of Provincial Cancer Agencies

Canadian Association of Radiation Oncology

Canadian Breast Cancer Foundation*

Canadian Cancer Society

Canadian Institutes of Health Research

Canadian Partnership Against Cancer

CancerCare Manitoba

Cancer Care Nova Scotia

Cancer Care Ontario

Cancer Research Society

Fonds de recherche du Québec – Santé

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Prostate Cancer Canada

Public Health Agency of Canada

Quebec Breast Cancer Foundation

Research Manitoba

Saskatchewan Cancer Agency

The Terry Fox Research Institute

Affiliate member: BioCanRx

* As of February 1, 2017, the Canadian Cancer Society and the Canadian Breast Cancer Foundation merged operations. The data in this report reflects the investments made by these individual organizations prior to this merger.

For details on the methodology used for this report, please consult our brief report, *Investment in Cancer Risk and Prevention Research, 2005–2010*, at http://www.ccra-acrc.ca. A slide deck based on the results of this analysis is also available on our website under the Publications menu.

## ACKNOWLEDGEMENTS

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