2021–2025

The Public Health Agency of Canada's OPEN SCIENCE ACTION PLAN

Public Health Agency of Canada
Agence de la santé publique du Canada

Canada

TO PROMOTE AND PROTECT THE HEALTH OF CANADIANS THROUGH LEADERSHIP, PARTNERSHIP, INNOVATION AND ACTION IN PUBLIC HEALTH.

—Public Health Agency of Canada

Également disponible en français sous le titre :
Plan d'action pour la science ouverte de l'Agence de la santé publique du Canada

Public Health Agency of Canada
Address Locator 0900C2
Ottawa, ON K1A 0K9
Tel.: 613-957-2991
Toll free: 1-866-225-0709
Fax: 613-941-5366
TTY: 1-800-465-7735
E-mail: hc.publications-publications.sc@canada.ca

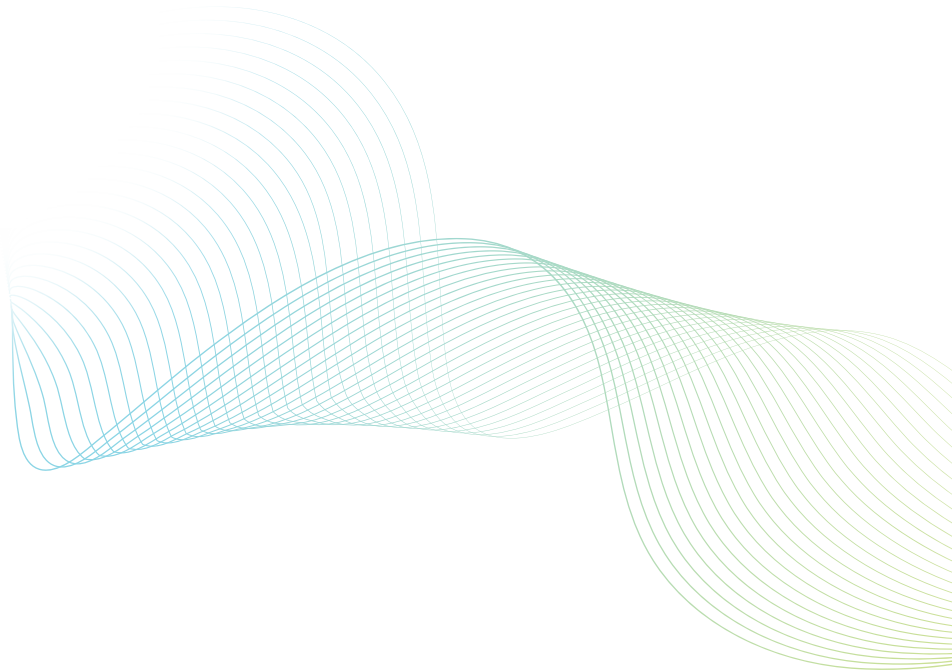
© Her Majesty the Queen in Right of Canada, as represented by the Minister of Health, 2021

Publication date: December 2021

This publication may be reproduced for personal or internal use only without permission provided the source is fully acknowledged.

Cat.: HP40-300/2021E-PDF
ISBN: 978-0-660-40929-0
Pub.: 210430

TABLE OF CONTENTS



EXECUTIVE SUMMARY

The Public Health Agency of Canada has committed to fostering scientific excellence and leadership through Open Science, and to implementing the recommendations arising from the Federal Roadmap for Open Science adopted in 2020.

This Open Science Action Plan details the priority actions needed to support a cultural shift to science that is open 'by Design and by Default' at the Agency by 2025. The development of this plan was informed by feedback received from the science and research community, and through engagement with key collaborators in federal Science-Based Departments and Agencies and our Health Portfolio partners.

PHAC's inaugural Open Science Action Plan has been designed not only to best support the delivery of our current mandate, but also to drive forward key steps that will contribute to raising trust and effective public health outcomes that are relevant to the evolving context of public health renewal in Canada.

Our 2021–2025 action plan is articulated around the following four priorities:

PRIORITY 1: Maximizing Open Access

- **Action 1:** Renew the PHAC policy on the dissemination of scientific and research publications in line with Open Science principles (March 2022).
- **Action 2:** Collaborate with the Office of the Chief Science Advisor and other federal organizations in the development and adoption of shared tools and infrastructure to support federal Science-Based Departments and Agencies in delivering their Open Science Action Plans (ongoing).

PRIORITY 2: Developing Strategies for FAIR Data Principles

- **Action 3:** Engage with PHAC Branches and key federal collaborators to assess needs, gaps and opportunities towards enhancing FAIR data principles (Findable, Accessible, Interoperable, Reusable) for science data at PHAC (target: March 2023).
- **Action 4:** Plan and design a user-centered digital platform for enhancing access to relevant public health data (target: March 2025).

PRIORITY 3: Enabling an Open Science Culture

- **Action 5:** Work with appropriate PHAC governance to develop agency-wide approaches to improve awareness and incentivise Open Science solutions in support of the delivery of PHAC's mandate and priorities (ongoing).
- **Action 6:** Review the career progression criteria for research scientists (SE-RES classification) to include considerations of Open Science activities (target: March 2022).

PRIORITY 4: Forward Planning and Measuring Progress

- **Action 7:** Establish an Open Science Steering Committee, led by the Office of the Chief Science Officer with collaboration and support from other key corporate functions, to provide oversight on the implementation of the PHAC Open Science Action Plan and its reporting to PHAC and the Office of the Chief Science Advisor (March 2022).
- **Action 8:** Pursue additional opportunities to spotlight Open Science successes, amplify PHAC science and the voice of scientists, and to promote knowledge equity and diversity within the Agency, across the federal government, and in the communities we serve (ongoing).

Achieving this program of work will require a whole-of-Agency commitment, from individual employees, to managers, and Agency leadership. Removing barriers to the widespread dissemination of federally-funded science thus represents an opportunity to mobilize PHAC expertise, to optimize uptake and transform public health on a national and global scale.

INTRODUCTION

Government of Canada Open Science Context

In joining the international Open Government Partnership (OGP) in 2012, Canada embarked on a global movement toward open, accountable, and transparent government. Since then, the commitment to those principles has been formalized through the release of four National Action Plans on Open Government (2012-2020). The commitments outlined therein set the direction for how Canada will share information and data, modernize operations, and build the culture and capacity for inclusive government. Through these action plans, Canada also committed to increasing the availability and discoverability of federally funded science and research.

In February 2020, in collaboration with representatives from federal and academic institutions, Canada's Chief Science Advisor (CSA) released the federal *Roadmap for Open Science*.[1] This Roadmap laid out the overarching principles and recommendations to make federal science openly available—maximizing benefits for the well-being, health, and economy of our country. Included among these was the recommendation that each science-based department and agency (SBDA) develop and implement an Open Science Action Plan that is informed by feedback from their science and research community, includes plans for a common, phased approach to make federal science freely and readily available to all Canadians, and respects privacy, security, ethical, and intellectual property considerations.

The Public Health Agency of Canada (PHAC) is committed to being a leader in this movement. This Action Plan outlines PHAC's initial actions in fostering science excellence and leadership through Open Science. It applies to all members of PHAC's scientific community, including all those who engage in, manage, support, communicate, or use science and research outputs.

---

[1] www.ic.gc.ca/eic/site/063.nsf/eng/h_97992.html

Vision

A cultural shift to an approach that is open 'by Design and by Default' means identifying meaningful opportunities to incorporate Open Science into our work early in the science development life cycle. Through investment in digital infrastructure, renewed policy and practical guidance, and the pursuit of internal and intramural knowledge exchange, this Action Plan will support PHAC's mandate to strengthen intergovernmental collaboration on public health, and to serve as a central point for sharing Canada's expertise with the rest of the world.

Why Open Science

Adopting an Open Science approach has clear advantages. These benefits apply to the knowledge producers, the scientific community, and society more broadly. Free and open access to scientific information, data, and dialogue can promote scientific integrity and rigour by ensuring accountability, increasing methodological reproducibility, and reducing the duplication of effort. Analytical capacity can be strengthened through accessible open datasets, allowing for linkage and timely insights to enable better evidence-based decision making. For knowledge producers, making scientific work more openly available can increase its visibility and broader impact, bolster citation rates, create new opportunities for collaboration and innovation, increase uptake by policymakers and ultimately foster trust in science among Canadians.

An Open Science approach frames taxpayer-funded science as a public good, leading to a democratization of knowledge by removing paywalls and other barriers to access. This can accelerate knowledge transfer, create opportunities for impact and public engagement, and enhance inclusion of diverse expertise and perspectives. Open Science approaches can support the co-creation and sharing of knowledge for and with the communities we serve. The development of accessible and innovative methods of information gathering and knowledge transfer can also support efforts to strengthen scientific literacy among the general population, and combat the proliferation of misinformation on science topics. Further, the global COVID-19 pandemic has made abundantly clear the potential benefits of open data sharing and rapid access to emerging evidence for scientific progress and Canada's public health response. Removing barriers to the widespread dissemination of federally funded science thus represents an opportunity to mobilize PHAC expertise, to optimize uptake and transform public health on a national and global scale.

Building on Early Successes

PHAC has a strong history of leadership in Open Science and public health knowledge mobilization. PHAC publishes two Diamond Open Access peer-reviewed journals, the *Canada Communicable Disease Report*[2] and *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice*.[3] In a recent analysis of federal publication practices from 2014–2019, PHAC authors had the highest proportion of Open Access publications across SBDAs. Agency scientists and researchers frequently engage in community knowledge translation and education activities, and publicly available resources such as the Public Health InfoBase[4] provide user-friendly options for Canadians to interact with public health data. More recently, PHAC's leadership in the development of a Pan-Canadian Health Data Strategy will help address key gaps in the open collection, sharing, and use of health data across federal, provincial and territorial governments, and ultimately ensure that health services and public health decisions are informed by the best and latest information.

Engaging the Science Communities

From February–March 2021, PHAC employees were invited to complete an online survey on Open Science. Questions were posed on the scientific community, publications, data, and knowledge mobilization to determine what activities were already underway, perceived opportunities and motivations for engaging in Open Science, as well as challenges and barriers to the implementation of the Roadmap for Open Science recommendations at PHAC. All employees were invited to participate, and an inclusive definition of scientists and science contributors was used—encompassing all those who engage in, manage, support, communicate, or implement science and research activities. A full summary of survey results is available on PHAC's Open Science GCpedia page.[5]

The Open Science priorities described in this Action Plan were informed by the feedback received from survey responses and targeted engagement sessions that followed. Members of PHAC's science and research community identified institutional supports that are required to enable achievement of these priorities. These included the need for clear guidance and

---

2 www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-ccdr.html

3 www.canada.ca/en/public-health/services/reports-publications/health-promotion-chronic-disease-prevention-canada-research-policy-practice.html

4 https://health-infobase.canada.ca

5 www.gcpedia.gc.ca/wiki/PHAC_Open_Science

approval processes, essential tools and technological supports, training and resources, as well as opportunities for network building and knowledge sharing. These elements will be leveraged in the adoption of an 'Open by Design and by Default' scientific approach at PHAC, and in the implementation of the specific action items detailed below.

Contribution of Open Science to PHAC's Science Excellence

PHAC's Open Science Action Plan was developed to support the implementation of various internal and external policies and guidelines, including the recently adopted *PHAC Scientific Integrity Policy*, as well to strengthen PHAC's position as a trusted and recognized voice of public health science in Canada and globally.

This cultural shift and the achievement of our Open Science objectives requires a careful balance in order to be "as open as possible and as secure as necessary". Determining the appropriate degree of openness while affording the necessary protections in light of impacts on Indigenous rights, Federal-Provincial-Territorial affairs, privacy and confidentiality considerations for individuals or businesses, and other security considerations will be critical to meeting all of our commitments. The creation, protection, and management of IP is essential to achieving PHAC's mandate, and in initiatives that can bring new diagnostics, therapies and vaccines to market. An 'Open by Design and by Default' approach does not mean that all science must necessarily be made open. The *Framework for Implementing Open-by-Default with Federal Government Science*[6] provides an overview of the above considerations, including appropriate exceptions to "Open by Design and by Default", a decision tree for releasing scientific information, details on the relevant legislation, as well as the roles and requirements for various occupational levels across organizations. PHAC's collaborative relationship with provincial and territorial health authorities is an important determinant of the extent to which Canadian health data can be made open, but it also provides unique opportunities for cooperation to address gaps in the collection, sharing and dissemination of public health data and scientific knowledge. Similarly, coordinated implementation of Open Science initiatives across federal SBDAs will be a critical enabler of the fundamental shift toward Open Science and knowledge dissemination in Canada. PHAC will continue to engage in the collaborative design and phased implementation of shared solutions across federal departments.

---

[6] www.ic.gc.ca/eic/site/063.nsf/eng/h_98201.html

PHAC'S OPEN SCIENCE ACTION PLAN

PRIORITY 1: Maximizing Open Access

To support the transition to an 'Open by Design and by Default' strategy for scientific and research publications (published in Open Access journals or made immediately and freely available through digital repositories) while respecting privacy, security, and ethical considerations, as well as appropriate IP protection and disclosure, PHAC will:

- **Action 1:** Renew the PHAC policy on the dissemination of scientific and research publications in line with Open Science principles (March 2022).
- **Action 2:** Collaborate with the Office of the Chief Science Advisor and other federal organisations in the development and adoption of shared tools and infrastructure to support federal Science-Based Departments and Agencies in delivering their Open Science Action Plans (ongoing).

Once adopted, the policy on the dissemination of scientific and research publications will replace PHAC's previous publication policy. Along with its associated guidance documents, the new policy will outline clear and simple processes to support Open Access (OA) publishing, and well-defined roles and responsibilities for authors and their managers as Crown employees. Tools and resources will be developed to educate authors on the types of OA (Diamond, Gold, and Green) and aid in the selection of reputable OA journals. Decisions on where to publish and whether to make individual publications OA ultimately lie with the author. Where exceptions are applied, these should be documented by PHAC authors and their managers. PHAC will continue to engage with SBDAs to find solutions for federal authors, including a collective approach to address issues of IP, retaining rights and licensing, and Official Languages requirements in OA publishing. We will also participate in the development of a centralized infrastructure solution to host scientific articles and publications, in the form of a digital publications platform, and help define persistent identifier and metadata standards to ensure consistency across departments.

Whereas our initial efforts focus on increasing access to scientific articles and publications, many groups at PHAC have already adopted Open Science practices across various stages of the scientific life cycle (e.g. involvement of stakeholders and partners in review processes, open registration of protocols and methods, community science data collection). Open Science leaders within the Agency will be engaged to establish best practices for groups wanting to adopt similar approaches, and the PHAC Library and Federal Science Library Network will collaborate with SBDAs on common ways to support those efforts, such as processes for internal peer-review and the publication of preprints.

PRIORITY 2: Developing Strategies for FAIR Data Principles

To ensure that scientific and research data are Findable, Accessible, Interoperable and Reusable (FAIR), PHAC will:

- **Action 3:** Engage with PHAC Branches and key federal collaborators to assess needs, gaps and opportunities towards enhancing FAIR data principles for science data at PHAC (target: March 2023).
- **Action 4:** Plan and design a user-centered digital platform for enhancing access to relevant public health data (target: March 2025).

PHAC's recently designated Chief Scientific Data Officer will coordinate with PHAC's Chief Data Officer, the Chief Information Officer and other key functions to ensure that scientific and research data (including surveillance data) are considered in the development and implementation of PHAC's Data Strategy. Federal interoperability of scientific and research data will depend on adopting a common understanding of data definitions across governmental departments. The Corporate Data and Surveillance Branch (CDSB) will work to develop an internal digital data platform to support surveillance programs where appropriate, and will explore and implement a solution for how best to share public health data appropriately for external access.

PRIORITY 3: Enabling an Open Science Culture

To sustain the long-term viability of Open Science efforts and promote meaningful culture change, PHAC will:

- **Action 5:** Work with appropriate PHAC governance to develop agency-wide approaches to improve awareness and incentivise Open Science solutions in support of the delivery of PHAC's mandate and priorities (ongoing).
- **Action 6:** Review the career progression criteria for research scientists (SE-RES classification) to include considerations of Open Science activities (target: March 2022).

The development of a single-window PHAC Open Science portal on GCpedia will serve as a hub for Open Science tools, resources, guidance documents, and learning events. The PHAC Library will partner with the Federal Science Library Network and our SBDA counterparts to pursue transformative agreements with scientific publishers. These types of agreements may be negotiated to include Open Access publication fees for authors, in addition to institutional subscription-based journal access. The Office of the Chief Science Officer will assess resource requirements and budgetary constraints associated with Gold Open Access Article Processing Charges (APCs), and will work with the Office of the Chief Financial Officer to identify potential financial solutions. To improve internal and stakeholder awareness of PHAC science, we aim to have 100% of scientists profiled on the Federal Science Directory and to feature science and research outputs, programs, and outreach activities across federal websites and social media platforms. To ensure that Open Science efforts are recognized and fostered, the valued outcomes and evaluation criteria for career progression assessments (SE-RES) and annual performance management objectives (managers and other science contributors) will be reviewed to identify opportunities for the inclusion of activities that increase access to or the impact of PHAC science, as well as the feasibility of integrating Open Science objectives into branch evidence strategies.

PRIORITY 4: Forward Planning and Measuring Progress

To develop appropriate baseline performance indicators to measure the effectiveness and impact of our Open Science efforts, and adapt to new Open Science action items and priorities beyond 2025, PHAC will:

- **Action 7:** Establish an Open Science Steering Committee, led by the Office of the Chief Science Officer with collaboration and support from other key corporate functions, to provide oversight on the implementation of the PHAC Open Science Action Plan and its reporting to PHAC and the Office of the Chief Science Advisor (March 2022).
- **Action 8:** Pursue additional opportunities to spotlight Open Science successes, amplify PHAC science and the voice of scientists, and to promote knowledge equity and diversity within the Agency, across the federal government, and in the communities we serve (ongoing).

The Government of Canada publishes an annual report measuring the progress of its Open Science commitments. The report uses a combination of core metrics designed to capture general progress across federal science and supplemental metrics to highlight individual SBDA efforts. The PHAC Open Science Steering Committee will provide oversight on the monitoring and reporting of the Agency's Open Science Action Plan implementation and progress. As the Agency embarks upon a period of transformation and renewal, we will prioritize opportunities to incorporate new ideas and initiatives that promote access to—and the impact of—PHAC science in light of emerging priorities.

NEXT STEPS

The Office of the Chief Science Officer will lead PHAC's Open Science Steering Committee in the development of an evergreen Open Science Implementation Plan to address the initial OSAP priorities and action items detailed above. Coordination and refinement of the Implementation Plan—including identification of future Open Science priorities and action items—will be achieved through ongoing engagement with PHAC's science and research community, policy and governance tables, and enabling centres and branches.

Intramural collaboration and the pursuit of shared solutions will continue through engagement with the Interdepartmental Open Science Working Group and our Health Portfolio partners. These networks will be leveraged to identify horizontal solutions, achieve economies of scale, and ensure harmonized approaches across the federal science landscape.

All employees are invited to be involved as we move forward in strengthening a culture of openness, transparency, and scientific excellence at PHAC.

For any questions or comments, or to get involved in Open Science initiatives or the Open Science Steering Committee, please contact the Office of the Chief Scientific Officer: chief.science.officer-conseiller.scientifique.en.chef@phac-aspc.gc.ca.

GLOSSARY

Diamond Open Access: Journals where all publications are freely and permanently accessible with minimal restrictions on reuse via the journal or publisher's website from the time of publication, authors do not pay a fee.

Gold Open Access: Journals where all publications are freely and permanently accessible with minimal restrictions on reuse via the journal or publisher's website from the time of publication, authors typically pay a fee. Gold OA articles may also be published in hybrid journals that are subscription-based but make individual articles OA at the time of publication when authors pay a fee.

Green Open Access: Subscription-based journals that allow authors to deposit a version of their publication in a repository or on their personal website (i.e. "self-archiving") to be freely available, sometimes after an embargo period set by the publisher.

Federal science articles: Scholarly articles authored or co-authored by federal scientist(s) or researcher(s) in peer-reviewed academic journals.

Federal science publications: Scientific communications that scientists and researchers use to share their work. These include research or scientific reports, monographs, edited books, book chapters, conference proceedings, conference papers, conference contributions, posters, plain language summaries, and technical science products. These publications have been validated by a peer-review process.

Open Science: The practice of making scientific inputs, outputs and processes freely available to all with minimal restrictions. Scientific research outputs include (i) peer-reviewed science articles and publications, (ii) scientific and research data and (iii) public contribution to and dialogue about science. Open Science is enabled by people, technology and infrastructure. It is practiced in full respect of privacy, security, ethical considerations and appropriate intellectual property protection.

Science: The pursuit and use of knowledge and understanding through application of one or more elements of the scientific methods. In the context of this Action Plan, it is understood to include both fundamental and applied natural, physical, biomedical, social, and behavioural sciences, nursing, medicine, and other healthcare disciplines, as well as engineering and mathematical modelling.

Scientific and research data: Data that include, but are not limited to, observational, monitoring, operational, modelling and simulation, risk-assessment, survey and surveillance, research, and development of technology innovation data.