

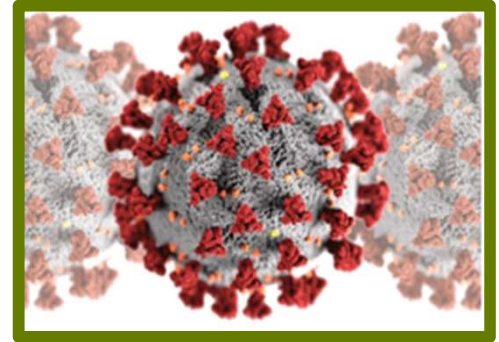
Open Science

and COVID-19

**Two-sided
Impact**

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COVID-19 impacts Open Science in Two (2) ways



- 1) Highlights need to share information - for Treatments and Policy
- 2) Fuels "Fake News" debates - stresses need for Trust in Science

Impact #1 : New level of openness



- 1) Flood of open access data and papers on corona virus
- 2) International nature of issues made obvious

Impact #2 : Public debates on science



- 1) Interest/questions about process and conflicting information
- 2) Some political agendas see benefit in undermining science

Canadian Commission for UNESCO

Open Science Paper

- Features both considerations
- and speaks to Canadian perspective

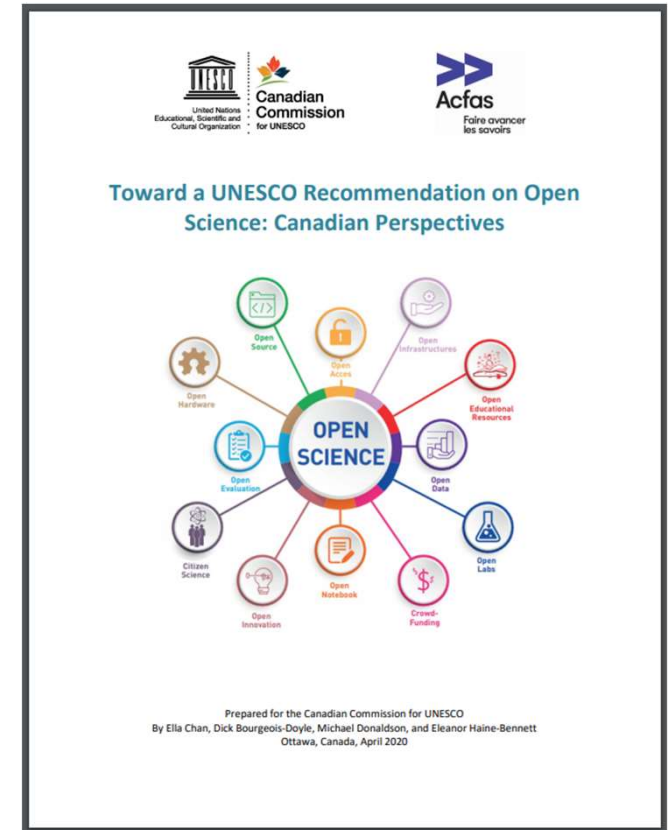


Our paper

- Reviews status of Open Science in Canada
- And opportunities to encourage Open Science

Promotes Openness

- To attack grand issues of climate, health, equality
- To encourage networking and collaboration



But also notes

- Issues raised by Open Science for science infrastructures
- And need for care in advancing Open Science agenda

Such as

- Makes it harder to control quality in content and access
- Encourages predatory publishing/unregulated pre-print

Limitations and Considerations

Though there are strong arguments for making the open release of data a default position for scientific research, certain issues suggest some caution should be exercised in the pursuit of such a policy and point to practical limitations to an Open Data regime.

1) Cost: One is the financial and human cost of time-intensive data management both for institutions and researchers. To be useful in the processes of assessment and reuse, data must be coupled with (1) rich metadata and preferably with associated text in a format that anticipates integration with other systems and (2) permanent digital identifiers that permit citation and verification of provenance long into the future. This requires high-level skills and capacities to manage deposition and long-term stewardship as well as a trusted data infrastructure. While investments in these systems and facilities might rightly be regarded as essential to the integrity of the scientific base, they challenge priorities and constitute an issue that all countries, institutions, and research communities will be compelled to consider. For example, the Open Government License for data is an attribution license. As datasets are combined the number of attributions, attribution types, and links to licenses increases, with associated increases in time and costs.

2) Ethics of Privacy and Confidentiality: While the sharing of datasets containing personal information empowers research in many fields of human concern from health care to economics, doing so in an Open Data format can threaten confidentiality, humanity's right to privacy, and the practice of ethical research. The Big Data paradigm, on the other hand, is characterized by uncontrolled and unconsented access to personal information. This is, in part, due to the increasing challenge of ensuring complete anonymization of personal records. Furthermore, anonymization procedures cannot erase the ethical concerns around all possible uses of personal data. For this reason, there is a strong public benefit to Open Data policies and strategies that, for example, require consent for data release or require deposition of data in secure repositories with limited access.

3) Commercialization: The trend toward Open Data in scientific research would seem to conflict with the inclination to protect and control intellectual property for commercial exploitation in a monopoly business model. For this reason, business firms are not normally expected to share proprietary data of economic value. Yet the route to greatest public benefit from research often lies in the development, production, and dissemination path of commercial enterprise. Questions thus arise when a scientific discovery has been publicly funded as part of a private-public sector collaboration or when data supporting a commercially important discovery, such as a medical treatment, relate to public risks. At the same time, some business activities have benefited from Open Data and shared understandings that provide the platform for further innovation and competition.

4) Safety and security: Some scientific discoveries hold the potential for harm as well as public benefit, and this advocates against publishing data related to national security, public safety, or health when such information could be misused though the research is publicly funded. While such work demands caution and care, Open Data proponents urge a balanced approach with case-by-case decisions and proportionate measures.

Canadian concern

about non-profit small publishers

- i.e - Leading national science publisher – Canadian Science Publishing
- Moving to Open Access – but needs revenues for transition
- Journals are cornerstones to scientific communities – venues for development



Other considerations

- National security
- IP for commercialization
- Privacy – Ethics



CCUNESCO Youth – More than just Journal Access

"Our concept of open science goes far beyond access to journals and data," says the paper's co-author Ella Chan, a University of British Columbia student and CCUNESCO Youth member. "It can include the movement to involve more non-expert citizens in the scientific process, the use of social media, and a range of science communications activities."



Bottomline - Open Science is Great

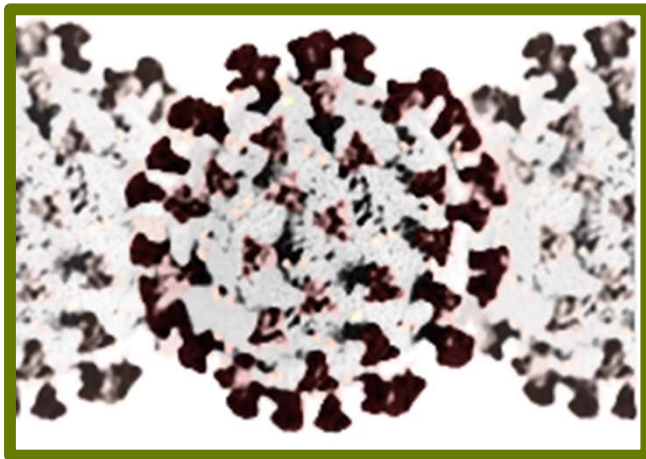
But UNESCO Recommendation should recognize

- There is a cost \$\$\$\$ to openness - producing and sharing *quality* science
- Must maintain and build infrastructure for “truly accessible” and useable science

This will also support public education

- instill public confidence – **Trust in Science**
- as well as supporting science-based policy





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