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How publicly funded research preserves scientific integrity

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ABSTRACT

Government funding for science has been under threat. Corporations and private industries (who already make up the majority of research and development funding in Canada) are often the favourites to make up the deficit when public funding gets axed. However, private funding for science can introduce conflicts of interest, biases, and profit-motivated agendas, while public funding is proven to result in impartial, ethical, and people-first science full of long-term benefits. This article explores the implications of corporate funding on scientific integrity by examining the checks and balances of the public funding system, examples of funding bias, and the dangers of disinformation. It becomes clear that candid funding disclosures, transparency of research initiatives, and standards to regulate commercial-science interactions are needed to preserve scientific integrity, for our own good.

KEYWORDS: Government funding, Funding bias, Research & Development, Policy, Disinformation

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Who foots the bill for science? In Canada, the two biggest funding sources for scientific studies (research and development (R&D)) are the public sector (government), and the private sector (industry and corporations). This funding leads to technological breakthroughs and a return-on-investment of around 450%.[1] Sustaining funding for R&D is profoundly important. Loss of funding, even for a single year, has devastating effects on the knowledgebase and output of the scientific community.[2] However, not all funding is made equal. While private funding boasts 59%[3] of Canadian R&D to the government's 5%, research shows there are risks when combining corporate interests with the scientific method: biases, lack of governance, absence of transparency, and an overall strategy of profit over people.

Private studies preferentially emphasize "applied" research, that which relates directly to consumers, commercial products/techniques, and boundary-pushing initiatives.[4] Public science is more often "basic" research into fundamental principles and long-term discovery. Said "basic" endeavours, while not immediately profitable, are often curated to serve public interest and focus on preemptive actions - like decades of publicly funded development and clinical trials leading to millions of lives saved by Covid-19 vaccines.[5,6] Basic principles form the basis for all applied research. Fundamental research also results in benefits like establishing water, food, vehicular safety, and medical care standards.[7]

In Canada, publicly funded studies are rigorously reviewed and monitored for ethics and scientific integrity.[8] However, the Secretariat on the Responsible Conduct of Research (Canada's research ethics board) does not have jurisdiction to oversee

privately funded projects, even those involving human testing.[9,10] Private studies benefit from a lack of regulation, quality control, and responsible ethics monitoring, especially if their results are disseminated via the media rather than through scientific publications.[i] If misconduct, human rights violations, or other unethical activity is alleged in a privately-funded study, the options for those impacted to fight back are limited. Victims or claimants can only attempt to submit complaints or take court action, placing them at a significant disadvantage. These vulnerabilities were exposed[10] when a psychologist from Arizona tested controversial brainwave therapy on indigenous Canadian children, promising to make them smarter, happier, and claiming the therapy could make them "see angels" or "walk on water". The privately funded nature of the work meant that no government agency could step in to vindicate victimized patients, a risk the participants did not know they were taking.

The peer-review process is a pillar of publicly funded and published research in Canada and beyond. Peer review committees[11] are responsible for allocating funds through all the major government granting agencies. This means funding for scientific study is handed out equitably, based on the merit and importance of each potential program, determined by a committee of field-specific experts without conflicting financial motives. Private funding on the other hand, can be handed out at the whim of corporations and donors without public consultation or democracy, to whichever project is likely to be profitable. Private pharmacological research, for example, tends to focus on diseases prevalent in higher income countries, because privileged patients more often become paying customers.[12,4]

Interference from corporate interests exists in all stages of research.[12] The most straightforward manifestation of private funding bias is that companies are more likely to publish results showing their own product is best — even when publicly funded

studies have mixed (or even negative) results.[12] This is well-documented in pharmaceutical[13,12] and biomedical[14] fields; public research focuses more on health factors, while private emphasizes marketable products and processes.[12,15] Cutting public funding leads to a direct uptick in partnerships between academics and corporations.[16-18] This form of corporate interference creates rampant conflicts of interest, and aids in legitimizing industries among their potentially most damning critics: academics, policymakers, and the public.[19]

Research direction can also be swayed by profit interests.[20,21] Corporations can carefully evade responsibility and shift blame onto consumers for negative effects, as Coca-Cola did by funding studies on how health is related to physical activity, rather than how health is affected by consuming their products.[22,23] Organizations will hide their involvement to maintain an image of neutrality in the court of public opinion, while secretly churning out industry-supporting results that appear to come from a reliable source.[22-24] Industries are capable of reshaping entire research fields around their policies;[25,12] these are unethical strategies to control the narrative.

Private companies also hold the leash when it comes to publishing their study results: they can omit unfavourable results or deem entire studies unpublishable.[25] This constitutes a violation of research integrity (fraud) under the government of Canada's Responsible Conduct of Research[ii], which, of course, does not apply to private investors. Corporations have also used falsified and fraudulent studies to dissuade new safety or public health regulations.[26]

Disinformation brings science to its knees. Corporations with profit incentives *will* lie to promote their cause. The article *Science Has a Major Fraud Problem. Here's Why Government Funding Is the Likely Culprit* [27] by the Foundation for Economic Education, a free-market entrepreneurship organization, is a

prime example. Their article advertises that fraud exists in only publicly-funded science, but closer inspection of the evidence disproves their own point: fraud is *also* discovered in privately-funded trials.[28-30,iii] Misrepresenting the truth is a predatory media tactic to deceive readers. Be wary of where information is coming from — anti-government science "think tanks" likely do not have the population's best interests at heart, often opposing many institutions of public good, such as universal health care, labour unions, and child labour restrictions.[31-34]

So far in 2025, news headlines have been laden with announcements of diminishing government funding for science. While this is harrowing, especially for those of us watching our livelihoods and passions slip away, it presents an indispensable opportunity to re-affirm the benefits of public funding for research and development, and to raise awareness of the risks when corporations fill the funding gap, all in the name of scientific integrity.

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[i] Even in cases where companies running private studies are required to provide their own ethics board/product testing in order to bring a product to market or perform clinical trials, there are no enforceable government standards for these internal reviews in Canada, and recent reports[35] about the American FDA reveal the potential dangers of this loophole.

[ii] Subsections 2.1.2a,b

[iii] Examples include: Carlisle, J. B., 2017. Anaesthesia.[29] Appendix S1, NEJM: Trial 682, funded by pharmaceutical company Pfizer.