



## ACCOUNTABILITY FOR CANADA'S COVID-19 RESPONSE

### Canada's role in covid-19 global vaccine equity failures

**Adam R Houston and colleagues** argue that Canada needs to reverse its track record from covid-19 and prioritise public need over profits in its domestic investments and global leadership for health

Adam R Houston,<sup>1</sup> Joanne Liu,<sup>2</sup> Roojin Habibi,<sup>3,4</sup> Srinivas Murthy,<sup>5</sup> Madhukar Pai<sup>2</sup>

<sup>1</sup> Human Rights Research and Education Centre, University of Ottawa, Ottawa, Ontario, Canada

<sup>2</sup> School of Population and Global Health, McGill University, Montreal, Quebec, Canada

<sup>3</sup> Faculty of Law (Common Law Section), University of Ottawa, Ottawa, Canada

<sup>4</sup> Global Strategy Lab, York University, Toronto, Ontario, Canada

<sup>5</sup> Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada

Correspondence to: A R Houston  
ahous062@uottawa.ca

Cite this as: *BMJ* 2023;382:e075149

<http://dx.doi.org/10.1136/bmj-2023-075149>

Inequitable access to covid-19 vaccines<sup>1</sup>—as well as tests, treatments, and other tools—has cost millions of lives, prolonged the pandemic, and highlighted tensions between countries' domestic responses and their collective global responsibilities. Resolving such tensions has continued implications, including for the pandemic treaty currently being negotiated by the World Health Assembly.<sup>2</sup> These tensions are also witnessed within Canada, a high income country that frames itself as a global health leader<sup>3</sup> yet became one of the most prominent hoarders of the limited global covid-19 vaccine supply, despite itself being wholly reliant on importation.

The government of Canada has a history of providing financial support for global health programmes and initiatives, but its record of sharing scarce commodities is less impressive. In 2009, the government's reticence to share H1N1 vaccines led to Canada's absence from a multinational dose sharing arrangement.<sup>4</sup> In 2022, the government procured additional doses of the mpox vaccine it had been stockpiling for over a decade, while never publicly responding to the World Health Organization's calls to share doses during a global shortage.<sup>5</sup> More broadly, financial contributions are rarely complemented by support for systemic change to improve access to medicines and technologies. These patterns are reflected in the covid-19 response.

#### Lessons from the pandemic

Early in the pandemic Canada's prime minister, Justin Trudeau, alongside other world leaders, called for fair and equal access to vaccines once they were developed.<sup>6</sup> As vaccines became reality, however, the focus rapidly turned inward towards securing vaccines for Canadians. By December 2020, the government boasted of securing the most doses per capita of any country—up to 429 million doses of seven different vaccines, roughly 11 for each of Canada's 38 million inhabitants.<sup>7</sup> Although overprocurement may be understandable given initial uncertainty about which, if any, vaccine candidates would prove effective, the failure to equitably redistribute doses to other countries in need in a timely manner once it became apparent Canada would have more than enough is harder to comprehend.

By the end of 2022, Canada had administered almost 96 million doses while delivering fewer than 29 million abroad.<sup>8</sup> This poor performance on sharing doses when they were most needed resulted in domestic oversupply, with tens of millions facing

expiry by late 2022.<sup>9</sup> Meanwhile, over two years after vaccination began in Canada, not a single dose had been manufactured domestically, a shortcoming that directly affected the government's actions both at home and abroad regarding measures to increase vaccine supply.

#### Covax contributor and competitor

Engagement with Covax, the international pooling mechanism intended to promote equitable access to covid-19 vaccines, highlights the tension between domestic and global priorities. Financially, Canada was one of only three states to contribute its fair share to Covax in 2021 and 2022 (box 1).<sup>17</sup> Unfortunately, government procurement practices directly undercut these financial contributions. By making extensive bilateral deals with drug companies, Canada and other high income countries claimed most of the available vaccines and pushed Covax—and by extension low and middle income countries—to the back of the queue for receiving vaccines.

#### Box 1: Canada's Covax pledges

The government of Canada's relationship with Covax underscores its willingness to commit money but reticence to share actual doses. Closer examination of commitments to share "vaccines" reveals they might consist of physical doses, a financial equivalent, or a combination of both.

- Covax was originally designed without any mechanism for sharing physical doses. When a surplus global sharing mechanism was deemed necessary in December 2020, Canada announced a C\$5m (£3m; €3.5m \$3.8m) contribution to setting it up.<sup>10</sup> Canada made this contribution before it had publicly committed to sharing any of its secured doses
- Canada's initial commitment of 100 million doses to Covax, in June 2021, did not include any doses from its bilateral contracts. Instead, this commitment constituted declining Canada's remaining allocation of 13 million doses from Covax and 87 million "equivalent" doses in financial contributions<sup>11</sup>
- Canada's first commitment to share doses from its bilateral contracts was not until mid-July 2021, when it pledged 17.7 million doses of Oxford-AstraZeneca's vaccine (which Canada no longer recommended).<sup>12</sup> By the end of July, Canada had received enough doses to fully vaccinate every eligible Canadian<sup>13</sup>
- Over the next four months, Canada committed additional doses both in kind and in cash, culminating in a final pledge of a total of 200 million doses by the end of 2022.<sup>14</sup> Of these 200 million, just 50.7 million—37.7 million doses from bilateral

contracts, plus the 13 million remaining from Canada's Covax allotment—were physical doses

- On 30 December 2022, just before the deadline, Canada updated its donation webpage to claim 196 million doses had been donated towards its 200 million pledge. However, just 25.1 million physical doses had been delivered through Covax, less than half of the 50.7 million pledged
- Of the pledged 50.7 million surplus doses, at least 13.6 million AstraZeneca doses ultimately expired undelivered.<sup>15</sup> Furthermore, most of Canada's pledged Covax allotment was for the Novavax vaccine but the company ended its supply agreement with Covax before delivery, suggesting these doses would never be delivered either<sup>16</sup>
- Outside of its Covax pledge, Canada's donation webpage shows it shared fewer than four million doses through bilateral agreements, of which more than three quarters were through a single shipment to Mexico in July 2022.

Although Canada undoubtedly contributed money to Covax, the conversion of that money into tangible doses remains opaque, with the widely varying prices for different vaccines making it difficult to substantiate the precise number of financial "equivalent" doses. During global shortages, few vaccines were available to buy, raising questions about which doses were purchased and when. Given the eventual shift from global shortage to global oversupply, the value and fate of new "equivalent" doses at the end of 2022 similarly remains unclear. What is clear, however, is that Canada, the state that secured the world's most doses per capita, ultimately shared only a small fraction of them

Recognising the growing access divide, WHO called for a halt to such bilateral deals.<sup>18</sup> Canada nevertheless subsequently signed its eighth—with Serum Institute of India, the manufacturer that Covax was most reliant on to supply lower income countries.<sup>19</sup> Meanwhile, Canada became the sole G7 country to claim its allotted doses from Covax in the first round of distribution.<sup>20</sup> Although Canada had a legal right to receive Covax doses, doing so while competing with Covax through bilateral deals, and at a time many low income countries had yet to receive any doses, hardly exemplified the stated commitment to fair and equal access.

### Inconsistencies on intellectual property rights

As Canada's procurement minister noted in early 2021, the makers of all seven covid vaccines initially secured were asked to make their product in Canada, and all declined.<sup>21</sup> While many states reliant on importing vaccines supported measures to increase global supply—most notably, the proposal to temporarily waive certain intellectual property rights related to covid-19 products under the World Trade Organisation's agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)<sup>22</sup>—Canada did not. Despite regularly reiterating that it was participating in negotiations to identify consensus based solutions, Canada never adopted a public stance on the TRIPS waiver, even after the US government announced support for a limited waiver for vaccines.<sup>23</sup>

Despite no public stance, the Canadian delegation argued during WTO deliberations that the proposed waiver was unnecessary because existing flexibilities within TRIPS could be used instead.<sup>24</sup> In particular, Canada cited its experience using TRIPS article 31bis, which allows a state to over-ride patent monopolies to permit other companies to manufacture a medicine for export. Canada is the only country that has ever used this flexibility as an exporter (allowing a Canadian generic drug manufacturer to send an antiretroviral drug to Rwanda in 2008). However, when Bolivia attempted to use article 31bis to obtain a generic version of the Johnson & Johnson (Janssen) covid vaccine from a Canadian

company, the government would not even take the bureaucratic steps necessary to initiate the process.<sup>25</sup>

A similar inconsistency is reflected in shifts away from the government's initial willingness to remove domestic intellectual property barriers. In March 2020, its first piece of legislation targeting covid-19 contained provisions to temporarily sidestep patent monopolies during a public health emergency.<sup>26</sup> These measures passed well before effective vaccines emerged; they quietly expired, unused, in September 2020, by which time the government was negotiating contracts with drug companies. Its subsequent lack of support for similar measures on the international front<sup>23</sup> further strains Canada's credibility on vaccine equity.

### Transferring Canadian technology

Although no covid-19 vaccines have been manufactured domestically, Canada boasts its share of covid-19 innovations. The most important of these involve lipid nanoparticle technology, a crucial component of the mRNA vaccines. Key research on this originated at the publicly funded University of British Columbia before being spun off into multiple private companies.<sup>27</sup> However, public funding for this innovation has not been effectively leveraged into access, or even affordable pricing, either at home or abroad.

In turn, the government has done little to promote the global dissemination of this vital Canadian technology. For instance, its support for the WHO-led mRNA vaccine technology transfer hub in South Africa, intended to help build production capacity in Africa, has again consisted of writing a cheque rather than promoting transfer of what should be a proudly Canadian technology to the world.<sup>28</sup> Ironically, in the absence of tech transfer, the hub had to reverse engineer a vaccine.

### Revisiting domestic production

Lack of domestic covid-19 vaccine production left Canada vulnerable to problems such as price gouging, supply chain disruptions, export restrictions from manufacturing countries, and drug companies prioritising sales elsewhere. It also led to political sparring over the privatisation of Canada's Connaught Laboratories (birthplace of insulin in 1921, and former exporter of vaccines for diseases like smallpox) in the 1980s and subsequent administrations' failure to replace such public capacity. Both political and commercial considerations ultimately influenced Canada's actions on global vaccine equity (box 2).

#### Box 2: What factors separated Canada's rhetoric from reality on vaccine equity?

The reasons for the clear divide between what the Canadian government said regarding global vaccine equity and what it did are hard to establish. Public displays of support for global vaccine equity could have been driven by self-interest as Canada was wholly dependent on imported vaccines. However, the truth is likely to be more complex. At least two major factors seem to have influenced Canada's actions on vaccine equity.

##### Political climate

The first is the political climate, where the speed of vaccine access for Canadians was a major point of contention in federal politics.

The government was criticised when a high profile deal signed in May 2020 with the Chinese company CanSino Biologics to manufacture a covid vaccine at Canada's publicly owned National Research Council facilities fell apart. This was alleged to have left the government scrambling to procure alternatives.<sup>29</sup>

Once vaccines were approved, early delays in receiving shipments and unfavourable comparisons to the rollout in peer countries led Canada's procurement minister to declare Canada "will stop at nothing" to bring

in vaccines.<sup>30</sup> Ensuring sufficient access for all Canadians became a cornerstone of Canada's federal election in September 2021. The combination of electoral pressures domestically and finite supply globally makes it unsurprising that access beyond Canada's borders became a lower priority.

#### Industry relationships

The second factor, also directly related to the domestic vaccine supply, is the federal government's relations with the drug industry. In the years immediately before the pandemic the government had faced considerable industry opposition to its reforms of a regulatory body, the Patented Medicine Prices Review Board (PMPRB), aimed at lowering drug prices.<sup>31</sup> However, the need for access to innovative products in response to covid-19, and Canada's dependence on imports from commercial manufacturers elsewhere, seems to have shifted this relationship to be more congenial to industry.

Early in the pandemic, concerns were raised about industry conflicts of interest on Canada's opaque covid-19 vaccine task force.<sup>32</sup> Industry lobbying increased substantially during the pandemic, including around the TRIPS waiver negotiations.<sup>33</sup>

The demands of the covid-19 response were also invoked as a reason behind multiple delays in implementing PMPRB pricing reforms. However, despite ominous statements by drug companies and industry groups that these reforms would delay Canadian access to products including vaccines, the government downplayed any direct use of access to covid-19 vaccines as leverage.<sup>34</sup>

As of mid-2023, the pricing reforms, already scaled back considerably in the face of legal challenges, have come into effect on paper but stalled once again at the implementation stage, leading to upheavals within the PMPRB itself, including allegations the government has undermined the PMPRB's independence and added "its voice to that of industry."<sup>35</sup> Meanwhile, emerging government policies focus heavily on promoting intellectual property as an economic driver, without corresponding reference to public access, even for novel medicines filling global needs.<sup>36</sup>

The complexity of developing and maintaining capacity for producing vaccines should not be underestimated.<sup>37</sup> Nonetheless, covid-19 has spurred new policies and public investment to rebuild capacity in Canada.<sup>38</sup> Some of this capacity is publicly funded but privately held, such as Canada's C\$415m investment in Sanofi's (flu) vaccine plant.<sup>39</sup> Such investment has already been less successful than hoped; despite a sizeable government investment in building a manufacturing facility, and Health Canada approval for its covid-19 vaccine, Medicago's owners announced they were shutting the plant down before commercial production began.<sup>40</sup> This occurred even after the divestment of a tobacco company's minority ownership stake, which had underpinned a controversial WHO decision not to grant the vaccine an emergency use listing and make it eligible for distribution through Covax.

Other government investment is linked to public institutions, such as the Vaccine and Infectious Disease Organisation (VIDO-InterVac) at the University of Saskatchewan. Government owned capacity has increased too, including revitalising the National Research Council's Clinical Trial Material Facility and, importantly, constructing the Biologics Manufacturing Centre, which was completed in 2021 with the capacity to produce two million doses a month. However, by July 2023, the centre had not produced anything. This raises concerns about the government's approach of operating this publicly owned facility as a commercial venture being let out to private entities, rather than filling gaps left by the market. Thus far, the only project announced has been the Novavax (Nuvaxovid) covid-19 vaccine.<sup>41</sup> The fact Novavax accounts for a tiny fraction of doses administered in Canada, together with mounting questions about the company's future, raises further

questions about this allocation of the centre's capacity. The question now, with both domestic and international implications, is how Canada can use and maintain this renewed capacity for the future while placing the emphasis on healthy people rather than high profits.

## Rethinking domestic strategies and global health

Canada has the opportunity to translate overdue reforms into positive global health outcomes, not just for covid-19 but also for other serious public health threats. Exciting research is happening in Canada, but the country needs effective strategies to get research from the laboratory to the patient, and make resulting products affordable and accessible.

### Prioritise public benefits over private profits

One step is ensuring public investment in health research prioritises public benefits over private dividends. To this end, public research funding should come with strings attached.<sup>42</sup> An October 2022 parliamentary committee report on covid-19 vaccine equity recommends that Canada "ensure that its agreements to provide research and development funding include clauses that allow intellectual property resulting from that funding—including vaccines, therapeutics, and diagnostics—to be easily licensed to manufacturers serving low and middle income countries."<sup>43</sup> This is a useful starting point, particularly if the definition of intellectual property encompasses elements like clinical trial data and tech transfer. Concerningly, the government's response to this recommendation prefers commercial considerations and voluntary licensing, despite their demonstrated inadequacy during the pandemic, over including obligatory safeguards to ensure global access.<sup>44</sup>

### Use publicly owned manufacturing facilities to support underserved areas

Canada's revitalised approach to research and manufacturing must not overlook crucial areas where public health need outweighs commercial appeal, a longstanding problem even for diseases with pandemic potential. A prime example is the first licensed vaccine against Zaire species of the Ebola virus, developed at Canada's public National Microbiology Laboratory in the early 2000s. Unfortunately, lack of a development pathway and commercial interest led to delays that cost lives before the 2013 outbreak in west Africa finally prompted its completion.<sup>45</sup> In 2022, history repeated itself, with an outbreak in Uganda of another Ebola species still lacking an approved vaccine. A promising investigational vaccine for Ebola (Sudan species), using the same platform from the Canadian laboratory, has spent most of its existence on a shelf. Its inclusion in planned clinical trials was possible only because a drug company that had previously licensed it from Canada, but ultimately abandoned it for commercial reasons, found some investigational doses forgotten in a freezer.<sup>46</sup> Amid outbreaks in four countries since 2021, a nearly identical story holds true for a Marburg vaccine. Yet the government has been almost entirely absent from recent global developments around these promising Canadian innovations from a publicly funded laboratory.

This should change. For instance, a key issue in the Ugandan Ebola outbreak was the need for timely access to a sufficient supply of investigational doses. This is precisely the sort of contribution Canada's publicly owned facilities could make. Such an approach could also extend past the trial and approval phase, to post-market production at affordable prices; the Canadian developed Ebola (Zaire) vaccine, for instance, is highly effective but expensive. This would support Canadian innovation while ensuring public



manufacturing capacity is maintained, and put to good use, between pandemics.

### Use publicly owned or funded facilities for tech transfer

Covid-19 has also underscored the importance of tech transfer to producers elsewhere, a role Canada's new facilities, both public and publicly financed, could help serve. As Canada builds domestic production capacity to improve self-reliance, it must enable other countries wanting to do the same; being a global health ally means empowering lower income countries, particularly in the African region, to build the same means of preparedness for the next pandemic that Canada aspires to.

### Act internationally to encourage innovation and equity

Promoting innovation and equitable access to medical technologies at the international level also means adopting a principled Canadian position in ongoing negotiations to develop the proposed pandemic instrument,<sup>2</sup> as well as related processes such as amending the International Health Regulations.<sup>47</sup> These negotiations present a vital opportunity for Canada to advocate for and implement legal measures that promote equitable access to health technologies for all, including technology transfer, access to pathogen and benefit sharing mechanisms, and the primacy of public health over profits, particularly during public health emergencies. Unfortunately, the government has shown the opposite tendency in its proposed amendments to the pandemic instrument. For instance, it has not only proposed that tech transfer must occur on voluntary and mutually agreed terms, even during a pandemic, but attempted to embed this proposal within the instrument's definition of equity as a guiding principle.<sup>48</sup> Transparent disclosure of the positions that the government is actually taking on issues affecting access to medicines, and what influence underlies those decisions, is crucial.

As part of these strategies the government must increase its transparency regarding access to medicines more generally, including the terms and conditions of public funding for research and manufacturing, its interactions with the pharmaceutical industry, and its actions in international forums.

### Questions for a national covid inquiry

Governments that recited the adage that no one is safe until everyone is safe are still feeling the repercussions of their failure to follow through. This raises fundamental questions the Canadian government must ask itself. What can Canada do to achieve its desired role of global health leader, not only in its own eyes but those of the rest of the world? Will Canada be willing to take steps to ensure that public investment in public health research and pharmaceutical manufacturing capacity prioritises public benefits over private profits? And rather than signing cheques in support of the current trickle down, charity based model of pandemic response, how strongly is Canada willing to advocate to implement systemic change for global health?

#### Key messages

- Canada exemplified the tensions between domestic and international priorities in access to covid-19 vaccines, failing to follow through on its pledges and stated principles
- Canada hoarded vaccines during the most critical phase of the pandemic, while not supporting measures intended to increase global supply
- Lack of domestic vaccine production and subsequent reliance on importation left Canada vulnerable to pressures that directly affected its actions around global vaccine equity

- Canada's renewed domestic capacity can be harnessed to help it reinvestigate its role as a global health ally

Contributors and sources ARH is a legal scholar focused on access to medicines and legal tools in response to infectious disease, and does medical policy and advocacy on covid-19 vaccine equity in the medical humanitarian sector. JL is a professor at McGill University's pandemic emergency readiness laboratory. RH is an assistant professor at the Faculty of Law (Common Law Section), University of Ottawa, and an international law researcher with a focus on global health law and justice. SM is a paediatric critical care and infectious diseases specialist and clinical researcher whose focus is on acute infections and global health. MP is a professor of epidemiology and global health. All authors have worked on covid-19 vaccine equity in their professional capacities. This analysis draws on publicly available government data and statements, as well as media coverage and academic literature. ARH coordinated the analysis and wrote the initial draft; all authors contributed substantially to revision of subsequent drafts and finalisation of the article. ARH is guarantor.

Competing interests: We have read and understood BMJ policy on declaration of interests and have the following interests to declare: ARH is an employee of Doctors Without Borders/Médecins Sans Frontières (MSF) Canada but is writing in his personal capacity. RH serves as an independent expert of the WHO director general's review committee regarding amendments to the international health regulations. The views reflected in this article are hers, and not those of the committee. SM is an adviser for several non-profit global health agencies including WHO, Stop TB Partnership, Foundation for Innovative New Diagnostics, and the Bill and Melinda Gates Foundation.

Provenance and peer review: Commissioned; externally peer reviewed.

This article is part of a series commissioned by *The BMJ* ([www.bmj.com/canada-covid-series](http://www.bmj.com/canada-covid-series)). The lead editor was Jocelyn Clark.

- Moore S, Hill EM, Dyson L, Tildesley MJ, Keeling MJ. Retrospectively modeling the effects of increased global vaccine sharing on the COVID-19 pandemic. *Nat Med* 2022;28:23. doi: 10.1038/s41591-022-02064-y pmid: 36302894
- WHO. The World Together: Establishment of an intergovernmental negotiating body to strengthen pandemic prevention, preparedness and response. 2021. [https://apps.who.int/gb/eb-wha/pdf\\_files/WHASSA2/SSA2\(5\)-en.pdf](https://apps.who.int/gb/eb-wha/pdf_files/WHASSA2/SSA2(5)-en.pdf)
- Nixon SA, Lee K, Bhutta ZA, et al. Canada's global health role: supporting equity and global citizenship as a middle power. *Lancet* 2018;391:48. doi: 10.1016/S0140-6736(18)30322-2 pmid: 29483026
- Canada mulls options for H1N1 vaccine leftovers. CTV News 2009 Nov 27. <https://www.ctvnews.ca/canada-mulls-options-for-h1n1-vaccine-leftovers-1458861>
- Szklarski C. Canada's top doctor says talks underway to obtain more vaccine to fight monkeypox. CTV News 2022 Jun 30. <https://www.ctvnews.ca/health/canada-s-top-doctor-says-talks-underway-to-obtain-more-vaccine-to-fight-monkeypox-1.5970030>
- Trudeau J, Zewde SW, Moon J, et al. The international community must guarantee equal global access to a covid-19 vaccine. *Washington Post* 2020 Jul 15. <https://www.washingtonpost.com/opinions/2020/07/15/international-community-must-guarantee-equal-global-access-covid-19-vaccine/>
- Government of Canada. Supporting Canadians and fighting covid-19—fall economic statement 2020. 2020. <https://www.budget.gc.ca/fes-eea/2020/report-rapport/FES-EEA-eng.pdf>
- Government of Canada. Vaccines for covid-19. <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/vaccines.html>
- Auditor General of Canada. Covid-19 vaccines: independent auditor's report. Office of the Auditor General of Canada, 2022.
- Global Affairs Canada. Canada announces additional support for equitable access to COVID-19 tests, treatments and vaccines. 2020. <https://www.canada.ca/en/global-affairs/news/2020/12/canada-announces-additional-support-for-equitable-access-to-covid-19-tests-treatments-and-vaccines.html>
- Rabson M. Canada's vaccine donations to Covax to come only from its Covax supply: Gould. CTV News 2021 Jun 14. <https://www.ctvnews.ca/health/coronavirus/canada-s-vaccine-donations-to-covax-to-come-only-from-its-covax-supply-gould-1.5470027>
- Connolly A. Canada donating 17.7m AstraZeneca covid-19 vaccines amid global disparities. Global News 2021 Jul 12. <https://globalnews.ca/news/8020918/canada-covid-vaccine-sharing-as-trazeneca/>
- Prime Minister of Canada. Canada reaches major vaccine campaign milestone. 2021. <https://pm.gc.ca/en/news/news-releases/2021/07/27/canada-reaches-major-vaccine-campaign-milestone>
- Tasker JP. Canada promises 73 million more COVID-19 vaccine doses for the developing world. CBC News 2021 Oct 30. <https://www.cbc.ca/news/politics/canada-promises-covid-vaccine-doses-1.6231465>
- Dyer O. Covid vaccines: Canada to dispose of 13.6 million AstraZeneca doses owing to lack of demand. *BMJ* 2022;378: doi: 10.1136/bmj.o1700 pmid: 35803604
- Novavax ends COVID vaccine sale agreement with Gavi. Reuters 2022 Nov 21. <https://www.reuters.com/business/healthcare-pharmaceuticals/novavax-ends-covid-vaccine-sale-agreement-with-gavi-2022-11-21/>
- Government of Canada. Canada's aid and development assistance in response to the COVID-19 pandemic. [https://www.international.gc.ca/world-monde/issues\\_developpement-enjeux\\_developpement/global\\_health-sante\\_mondiale/reponse\\_covid-19\\_reponse.aspx?lang=eng](https://www.international.gc.ca/world-monde/issues_developpement-enjeux_developpement/global_health-sante_mondiale/reponse_covid-19_reponse.aspx?lang=eng)

- 18 Ghebreyesus TA. WHO director-general's opening remarks at the covid-19. Media briefing, 7 Jan 2021. <https://www.who.int/director-general/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-7-jan-2021>
- 19 Public Services and Procurement Canada. Canada to receive 2 million doses of AstraZeneca's COVID-19 vaccine manufactured by the Serum Institute of India. 2021. <https://www.canada.ca/en/public-services-procurement/news/2021/02/canada-to-receive-2-million-doses-of-astazeneca-covid-19-vaccine-manufactured-by-the-serum-institute-of-india.html>
- 20 Walsh M, York G. Canada the only G7 country to take vaccines from fund that helps developing countries. *Globe and Mail* 2021 Feb 3. <https://www.theglobeandmail.com/politics/article-canada-the-only-g7-country-to-take-vaccines-from-fund-for-developing/>
- 21 Rabson M. Every vaccine maker was asked to make their doses in Canada and all said no: Anand. *Ottawa Citizen* 2021 Feb 4. [https://ottawacitizen.com/pmn/news-pmn/canada-news-pmn/every-vaccine-maker-was-asked-to-make-their-doses-in-canada-and-all-said-no-anand/wcm/6cd5a9a0-1d5e-499d-a8b1-64b2307a2dda?utm\\_medium=Social&utm\\_source=Twitter#Echobox=1612461158](https://ottawacitizen.com/pmn/news-pmn/canada-news-pmn/every-vaccine-maker-was-asked-to-make-their-doses-in-canada-and-all-said-no-anand/wcm/6cd5a9a0-1d5e-499d-a8b1-64b2307a2dda?utm_medium=Social&utm_source=Twitter#Echobox=1612461158)
- 22 World Trade Organization. Waiver from certain provisions of the TRIPS agreement for the prevention, containment and treatment of covid-19. WTO, 2020. <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669R1.pdf&Open=True>
- 23 Kaplan T, Stolberg SG, Robbins R. Taking 'extraordinary measures,' Biden backs suspending patents on vaccines. *New York Times* 2021 May 5. <https://www.nytimes.com/2021/05/05/us/politics/biden-covid-vaccine-patents.html>
- 24 Government of Canada. Item 15 – Waiver from certain provisions of the TRIPS agreement for the prevention, containment and treatment of covid-19. 2020. [https://www.international.gc.ca/world-monde/international\\_relations-relations\\_internationales/wto-omc/2020-12-10-TRIPS-ADPIC.aspx?lang=eng](https://www.international.gc.ca/world-monde/international_relations-relations_internationales/wto-omc/2020-12-10-TRIPS-ADPIC.aspx?lang=eng)
- 25 Abbas MZ. Canada's political choices restrain vaccine equity: the Bolivia-Biolyse case. South Centre, 2021. [https://www.southcentre.int/wp-content/uploads/2021/09/RP136\\_Canadas-Political-Choices-Restrain-Vaccine-Equity-The-Bolivia-Biolyse-Case\\_EN-1.pdf](https://www.southcentre.int/wp-content/uploads/2021/09/RP136_Canadas-Political-Choices-Restrain-Vaccine-Equity-The-Bolivia-Biolyse-Case_EN-1.pdf)
- 26 COVID-19 Emergency Response Act. Sect. Part 12, (S.C. 2020, c. 5). 2020. [https://laws-lois.justice.gc.ca/eng/annualstatutes/2020\\_5/FullText.html](https://laws-lois.justice.gc.ca/eng/annualstatutes/2020_5/FullText.html)
- 27 Herder M, Gold ER, Murthy S. University technology transfer has failed to improve access to global health products during the covid-19 pandemic. *Healthc Policy* 2022;17:25. doi: 10.12927/hcpol.2022.26830 pmid: 35686821
- 28 Government of Canada. Canada's aid and development assistance in response to the covid-19 pandemic. [https://www.international.gc.ca/world-monde/issues\\_development-enjeux\\_developpement/global\\_health-sante\\_mondiale/response\\_covid-19\\_reponse.aspx?lang=eng](https://www.international.gc.ca/world-monde/issues_development-enjeux_developpement/global_health-sante_mondiale/response_covid-19_reponse.aspx?lang=eng)
- 29 Anderson S, Ward R, McKeown B. How a failed deal with China to produce a made-in-Canada COVID-19 vaccine wasted months and millions. *CBC News* 2021 Oct 14. <https://www.cbc.ca/news/canada/cansino-deal-canada-nrc-fifth-estate-1.6208241>
- 30 Canada "will stop at nothing" to bring in vaccines: procurement minister. *CBC Radio* 2021 Feb 5. <https://www.cbc.ca/radio/asithappens/as-it-happens-the-friday-edition-1.5902813/canada-will-stop-at-nothing-to-bring-in-vaccines-procurement-minister-1.5902815>
- 31 Health Canada. Government of Canada announces changes to lower drug prices and lay the foundation for national pharmacare. 2019. <https://www.canada.ca/en/health-canada/news/2019/08/government-of-canada-announces-changes-to-lower-drug-prices-and-lay-the-foundation-for-national-pharmacare.html>
- 32 Lexchin J. Covid-19 vaccine task force and conflicts of interest. *Healthcare Policy* 2022;17:7. doi: 10.12927/hcpol.2022.26732 pmid: 35319440
- 33 Barry-Shaw N. How Canada became a vaccine villain. *The Breach* 2021 Dec 2. <https://breachmedia.ca/how-canada-became-a-vaccine-villain/>
- 34 Kirkup K, Hannay C. Opposition parties want Pfizer, ministers to appear before Commons committee over drug regulation delay. *Globe and Mail* 2021 Jan 15. <https://www.theglobeandmail.com/politics/opposition-parties-want-pfizer-ministers-to-appear-before-commons/>
- 35 Vogel L. Resignations at Canada's drug pricing panel raise independence questions. *CMAJ* 2023;195:9. <https://www.cmaj.ca/lookup/doi/10.1503/cmaj.1096044>. doi: 10.1503/cmaj.1096044 pmid: 36918186
- 36 Government of Canada. A blueprint for the Canada Innovation Corporation. 2023. <https://www.canada.ca/content/dam/fin/publications/cic/cicb-cicpd-eng.pdf>
- 37 Plotkin S, Robinson JM, Cunningham G, Iqbal R, Larsen S. The complexity and cost of vaccine manufacturing—an overview. *Vaccine* 2017;35:71. doi: 10.1016/j.vaccine.2017.06.003 pmid: 28647170
- 38 Innovation, Science and Economic Development Canada. Canada's biomanufacturing and life sciences strategy, 2022. <https://ised-isde.canada.ca/site/biomanufacturing/en/canadas-biomanufacturing-and-life-sciences-strategy>
- 39 Government of Canada. The Government of Canada makes historic investment to strengthen Canada's biomanufacturing sector. 2021. <https://www.canada.ca/en/innovation-science-economic-development/news/2021/03/the-government-of-canada-makes-historic-investment-to-strengthen-canadas-biomanufacturing-sector.html>
- 40 Kirby T. Philip Morris ejected from Canadian vaccine collaboration. *Lancet Respir Med* 2023;11:e40. <https://linkinghub.elsevier.com/retrieve/pii/S221326002300053X>. doi: 10.1016/S2213-2600(23)00053-X pmid: 36773624
- 41 Novavax to make COVID-19 vaccine shots in Canada. *Reuters* 2022 Dec 7. <https://www.reuters.com/business/healthcare-pharmaceuticals/novavax-make-covid-19-vaccine-shots-canada-2022-12-07/>
- 42 Junod Moser D, Boulet P, Childs M, Shieh M, Pécoul B. Striking fair deals for equitable access to medicines. *Journal of Intellectual Property Law Practice* 2023;jpad025 doi: 10.1093/jiplp/jpad025
- 43 Standing Committee on Foreign Affairs and International Development. Overcoming the barriers to global vaccine equity and ending the pandemic. 2022. <https://www.ourcommons.ca/Content/Committee/441/FAAE/Reports/RP11968481/faaerp05/faaerp05-e.pdf>
- 44 Government of Canada. Government response to the fifth report of the House of Commons standing committee on foreign affairs and international development: overcoming the barriers to global vaccine equity and ending the pandemic. 2023. <https://www.ourcommons.ca/DocumentViewer/en/44-1/FAAE/report-5/response-8512-441-136>
- 45 Herder M, Graham JE, Gold R. From discovery to delivery: public sector development of the rVSV-ZEBOV Ebola vaccine. *J Law Biosci* 2020;7:lsz019. doi: 10.1093/jlb/lsz019 pmid: 34221434
- 46 Merck locates frozen batch of undisclosed Ebola vaccine, will donate for testing in Uganda's outbreak. 2022 <https://www.science.org/content/article/uganda-may-use-destroyed-ebola-vaccine-merck-fight-its-growing-outbreak>
- 47 WHO. Strengthening WHO preparedness for and response to health emergencies. 2022. [https://apps.who.int/gb/ebwha/pdf\\_files/WHA75/A75\(9\)-en.pdf](https://apps.who.int/gb/ebwha/pdf_files/WHA75/A75(9)-en.pdf)
- 48 World Health Organization. Zero draft of the WHO CA+ for the consideration of the intergovernmental negotiating body at its fourth meeting (INB drafting group version: 4 April 2023 at 18:25 hours CEST). 2023. <https://www.keionline.org/wp-content/uploads/Politi-co4April2023.pdf>