

The role of GPs and nurses in vaccination during the COVID-19 pandemic

Adriana Virginia Barros Faical^{a, b}, Nestor Lemos Ferreira^c

^a Department of Physical Therapy and Postgraduate Program in Medicine and Health, Federal University of Bahia, Salvador, Brazil

^b Bahiana School of Medicine and Public Health, avsbarrros@hotmail.com.

^c University of South Wales, Cardiff, South Wales, nestor_ferreira@hotmail.com.

Abstract. During the pandemic COVID -19 there were various challenges around the world. To address the health crisis, global leaders and health experts sought to contain the disease. Scientists and researchers strove to develop timely vaccines. Nevertheless, results varied across countries, given the procedures and strategies used. Nevertheless, all levels of health care were important to support and care for the population, especially primary care. This paper discusses the role of general practitioners and nurses in vaccination against COVID-19.

Keywords. Primary Health Care, Vaccination, and COVID-19

1. Introduction

The pandemic COVID-19 brought unequalled changes around the world. Governments, researchers and health providers addressed efforts to cope with the sanitary crisis.(1),(2) The development and deployment of vaccines was an important way to control the pandemic, and many countries adopted different policies to ensure efficient vaccination coverage. (3) In this paper, authors present the role of general practitioners (GPs) and nurses in vaccination during the COVID-19 pandemic in two countries on the American continent: Brazil and Canada.

Brazil is the fifth largest country in the world and has a population of around 216.532 million people with a gross domestic product (GDP) per capita of U\$\$ 7,507.2. In contrast, Canada is the second largest in area with a population estimated at 38,807.628 million, whose GDP per capita is U\$\$ 51,987.9.

Facing the pandemic, both countries implemented a centralized COVID policy. However, Canada registered less than half of confirmed deaths when compared to Brazil. That might be attributable to their healthcare systems and personnel attributions, which depict remarkable singularities, despite some correspondence. (4)

2. Methods

We searched 3 databases, MEDLINE, LILACS, and Web of Science, as well as manual searches in English, French and Portuguese. All study designs were considered, regardless of year of publication.

Search terms were vaccination AND COVID-19 AND health system AND general practitioners AND nurses. We also searched data on governments official platforms related to the countries analysed.

3. Results

3.1 Health System Information

For a deeper and more precise comprehension of such aspects, Toth typology was the chosen one due to its complexity and variety of themes. Having said that, both the Brazilian and the Canadian health financing systems are to be classified into the universalist definition. In that sense, the whole population is covered regardless of socioeconomic status, domicile, or occupational activity, thus diverging from other representations such as direct market and social health insurance. (5)

The former allows only those who have higher incomes to access health care services as health

professionals' payment is out-of-pocket and fees may be established individually whilst the latter covers only a fraction of society, usually the economically active population, including preceding workers. Since the 1970's it has become the most representative model among the Organisation for Economic Cooperation and Development (OECD) countries, representing an almost two-fold increase in 30 years.

In Canada, service arrangements are separated, that is, they are not necessarily managed by the public machine, hence GPs (also known as family physicians) may either individually work as self-employed persons or as a team running a clinic with peers and earn their incomes in a fee-for-service scheme. (6)

In Brazil, the provisioning system is integrated: the state both finances 100% and offers the services to the insured without co-payment. Still, all health professionals may be considered public workers since their monthly incomes are paid by the public machinery.

Regarding gatekeeping, Brazil and Canada in practice share the same gateway to specialised assistance: the GP refers the patient to secondary care. However, Canada is taken as a mixed mechanism for such referral is not a must like the Brazilian arrangement, although its population acts as if it were. To fill the gap concerning specialists, some Brazilians reach out to private insurance companies in order to meet their personal necessity for secondary care.

Tab. 1 - Comparison between health systems in Brazil and Canada.(6)

Health systems	Brazil	Canada
Financing	Universalist	Universalist
Provision	Integrated	Separated
Gatekeeping	GP refers patients to secondary care	Not GP centred, but population acts as if it were

3.2 Primary Care Information

Health systems around the globe encompass different levels of complexity. The concept of primary care involves accessible services that are accountable for addressing most personal healthcare needs and developing a sustained partnership with patients in the context of the community. (7)(8)

According to Ellner and Phillips, effective primary care services lead to better health outcomes.(9) In Canada, PHC services are performed by a nurse practitioner and a GP. This type of cooperation involves routine care, support with home assistance,

health promotion, nutrition counselling, and end-of-life care. (10)

The number of GPs and nurses for 100.000 habitants is 124 and 1235, respectively. For a better comprehension of GPs and nurses' roles in both countries refer to the table 2.

Concerning Brazil, a PHC single team comprises family physicians, nurses, nurse assistants, and community health workers who are employees in public facilities named basic health units (BHUs), where primary care in Brazil is carried out. (11)

Regarding professional competencies, GPs in Brazil exert most of the functions as do their colleagues in Canada in a person-centred approach, but with a slight difference worth mentioning. So, in Brazil, they neither dispense medication nor inoculate vaccines. Instead, nurses oversee such attributions.

In overall terms, babies' deliverance is performed by obstetricians while emergency care medicine by internists. Small surgical procedures like superficial wound treatment, sutures, abscess incisions, and drainage are on their accountability. (12) Out of that, one may notice that they are not to be found as hospital workers, but employees at BHUs or clinics run by the private sector.

About nurses in PHC service, apart from what they do in Canada, which resembles Brazil, they also supervise nurse assistants, and community health workers and they might also be able to become the head of BHUs. Still, all those health professionals periodically visit bedridden or with impaired mobility patients at their domiciles to provide home assistance. (11),(13)

The number of GPs and nurses for 100.000 inhabitants is 97 and 130, respectively. An important difference is that 94% of the family physicians in Brazil are employed by the public sector and 81% are below 30 years old. In 2020, the ratio between GPs and specialists was 0.64, maybe due to low perceived prestige in the country, despite growing efforts from both private and public medical schools in late years to draw attention to family and community medicine. (12),(14)

Tab. 2 - Overall comparison between the role of GPs and nurses in Brazil and Canada. (11),(15)

Professional roles	Brazil	Canada
Examine patients	GP	GP
Diagnostic procedures	GP	GP
Babies' deliverance	Secondary care	GP
Emergency care	Secondary care	GP
Vaccine inoculation	Nurse	GP
Pre- and post-natal care	GP	GP

Wound care	Nurse	Nurse
Triaging patients	Nurse	Nurse
Home care	Nurse	Nurse
Maternal and infant care	Nurse	Nurse
Health education	Nurse	Nurse

The integration of primary and secondary care in Canada is variable according to the province. The ratio between GPs and specialists is approximately 1:1, which lets one infer that GPs are seen with more prestige in the country and that might be the reason why junior doctors aim to become family physicians.(16)

In general, services are provided at home or at a community or institutional level (especially in respect of long-term or chronic treatment). There is no mandatory formal referral process. Hence, it may occur because of the patient's free will to seek those spaces or someone in charge of him (caregiver or family member) as well as by means of professional recommendation.

In Brazil, PHC has expanded in the last years with a decentralised pattern, supported by innovative programs.(11) Despite public policies created to improve the integration among different levels of complexity, there are many challenges to expanding care that remain unsolved.

For example, interfaces that integrate PHC and secondary assistance are limited to a referral piece of paper, in which the family physician briefly describes the patient's medical history and the reason why he is being referred to the second level of care.

However, countless times the GP does not have any feedback from the specialist, thus undermining the coordination and comprehensiveness of care. One of the underlying causes of such problems is the lack of a national integrated information system.

In many Brazilian cities, medical appointments are not digitally information but registered in traditional handwritten patient records. Provided that, if the specialist writes the patient's referral back to his registered GP (when they seldom do), individuals rarely hand it to their family doctors for they lost it, forgot it at home, or found it irrelevant to bring it to the medical visit.

The care network is limited to fragile referral and counter-referral mechanisms that result in an overloaded queue for specialised services. The inefficient communication between services and professionals at different levels of assistance has been impactful on the resoluteness and strength of the system. Differences between countries were summarized in the figure 1.

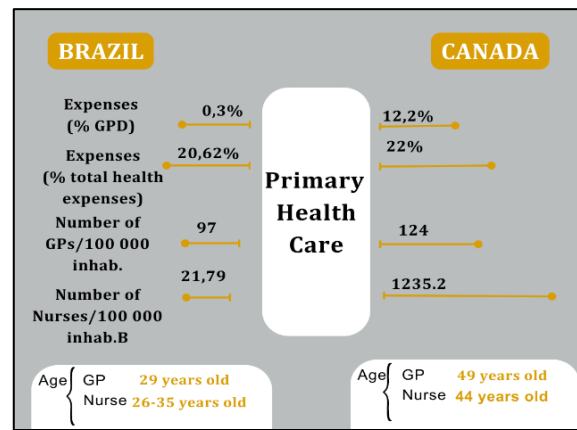


Figure 1. Comparison of Primary Health Care between Brazil and Canada(11)- (14)

3.3 Vaccination Information

The focus of this section is vaccination schemes and vaccination coverage first and second, the role of nurses and GPs in vaccination.

Immunization against Influenza is recommended by the Brazilian health authorities and is also universally subsidized. Its vaccination rate is 80,72% in contrast with Canada, while only 38% of its adult population is vaccinated against it. Last but not the least, Sars-Cov-2 immunization in both countries is recommended and financed with public resources and their coverage rate goes as follows in Figure 2.(17)(18)

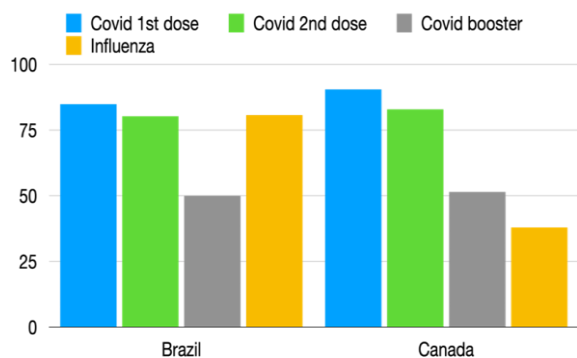


Figure 2. Sars-Cov-2 Immunization - Coverage rate in Brazil and Canada, 2023^{17,18}.

Considering professionals tasks involved in the vaccination process, in Brazil, nurses and nurse assistants play an exclusive role in promoting vaccination programs and inoculating vaccines at Basic Health Units and specialized referral centers. On the other hand, in Canada the administration of immunobiologicals is performed by a more broadened scope of health professionals, that is, family physicians, pediatricians, and pharmacists at local public health offices and some walk-in clinics. However, services may vary across jurisdictions.

In regard to vaccination monitoring, in Brazil it

occurs through protocols established by the National Immunization Program under the supervision of the Ministry of Health and its representative branches at state and municipal levels, the so called Health Secretariats. In Canada there is the adult and childhood National Immunization Coverage Survey conducted every two years by Statistics Canada on behalf of the Public Health Agency of Canada since 2011.

Facing COVID-19, the vigilance and monitoring of vaccination coverage change to ensure data and control security. Therefore, in addition to local health agencies, the World Health Organization (WHO) carries out this monitoring daily. This information is also available on platforms such as the ourworldindata.org. (19)

According to the WHO, potential sources for COVID-19 vaccination data are routine monitoring, periodic surveys, and surveillance. (20) Considering the social and economic repercussions of the COVID-19 pandemic around the world, immunization against Sars-Cov-2 played an essential role in reducing deaths, hospitalization, and emergency visits as well as enabling a return to the economic and labor market. Challenges concerning this scenario only have been overcome with the continued commitment and dedication of researchers, health providers, and policymakers. Maybe, one among many legacies of this pandemic.

Considering the above information, GPs and nurses in Canada seem to exert a more interdisciplinary responsibility in their daily PHC activities, thus varying from Brazil, where they play strict roles in their duties. However, in regard to the covid-19 vaccination campaign, both countries show little flexibility related to health professional accountability in the former vaccine inoculation is performed by GPs while in the latter only nurses and nurse assistants execute such task.

4. Conclusion

The aim of this study was to provide information about the role of GPs and nurses in vaccination during COVID-19 in Brazil and Canada, considering differences between the health systems in both countries. Similarities could be observed, but there are remarkable differences related to the system organization, delivery of care, and PHC professional duties. Although they belong in the American continent and possess large geographical areas, they branch to opposite sites speaking of socioeconomic development, thus impacting health outcomes.

High-coverage vaccination against Sars-Cov-2 was equivalent, nonetheless, mortality rates were higher in Brazil, despite the country's advances in public health, GDP and the percentual of investments are challenges to improve indicators in a country with a high population rate and lower level of education.

Many lessons are yet to be learned from this hard time. Given the direct contribution to technical excellence and the prevention, diagnosis, and management of diseases, strengthening the role of primary care and their staff represent a plausible strategy to face health crises at a worldly level.

Acknowledgement

The authors are grateful for the support and supervision of Professors Olga Angelovská and Zuzana Kotherová.

References

1. Mallah SI, Ghorab OK, Al-Salmi S, Abdellatif OS, Tharmaratnam T, Iskandar MA, et al. COVID-19: breaking down a global health crisis. *Ann Clin Microbiol Antimicrob* [Internet]. 2021;20(1):1–36. Available from: <https://doi.org/10.1186/s12941-021-00438-7>
2. Coccia M. Preparedness of countries to face COVID-19 pandemic crisis: Strategic positioning and factors supporting effective strategies of prevention of pandemic threats. *Environ Res* [Internet]. 2022;203(March 2021):111678. Available from: <https://doi.org/10.1016/j.envres.2021.111678>
3. Hasan T, Beardsley J, Marais BJ, Nguyen TA, Fox GJ. The implementation of mass-vaccination against SARS-CoV-2: A systematic review of existing strategies and guidelines. *Vaccines*. 2021;9(4):1–15.
4. Current world population by country.
5. Toth F. Classification of healthcare systems : Can we go further ? *Health Policy (New York)* [Internet]. 2016;120(5):535–43. Available from: <http://dx.doi.org/10.1016/j.healthpol.2016.03.011>
6. A profile of physicians in Canada, 2020 _ CIHI.
7. Bazemore A, Neale AV, Lupo P, Seehusen D. Advancing the science of implementation in primary health care. *J Am Board Fam Med*. 2018;31(3):307–11.
8. Pinto RM, Wall M, Yu G, Penido C, Schmidt C. Primary care and public health services integration in Brazil's unified health system. *Am J Public Health*. 2012;102(11):69–76.
9. Ellner AL, Phillips RS. The Coming Primary Care Revolution. *J Gen Intern Med*. 2017;32(4):380–6.
10. Hutchison B, Levesque JF, Strumpf E, Coyle N. Primary health care in Canada: Systems in motion. *Milbank Q*. 2011;89(2):256–88.
11. Paim J, Travassos C, Almeida C, Bahia L, MacInko J. The Brazilian health system: History, advances, and challenges. *Lancet*

[Internet]. 2011;377(9779):1778-97.
Available from:
[http://dx.doi.org/10.1016/S0140-6736\(11\)60054-8](http://dx.doi.org/10.1016/S0140-6736(11)60054-8)

12. Informações de Saúde (TABNET) – DATASUS.
13. van Stralen AC, Carvalho CL, Girardi SN, Pierantoni CR, Reis IA, Cherchiglia ML. The scope of practice of primary health care physicians in rural and urban areas in Brazil. *Cad Saude Publica*. 2021;37(9):1-16.
14. Brasil NO. Demografia 2020. 2020.
15. Lukewich J, Allard M, Ashley L, Aubrey-Bassler K, Bryant-Lukosius D, Klassen T, et al. National Competencies for Registered Nurses in Primary Care: A Delphi Study. *West J Nurs Res*. 2020;42(12):1078-87.
16. Public Health Agency of Canada - Canada.
17. Little N. COVID-19 Tracker Canada [Internet]. COVID19Tracker.ca. 2020. Available from: <https://covid19tracker.ca/vaccinationtracker.html>
18. CNS. Conselho Nacional de Saúde - Vacinômetro [Internet]. 2021. Available from: <https://conselho.saude.gov.br/vacinometro>
19. Our World in Data. Coronavirus Pandemic (COVID-19) - Our World in Data. 2022. Published online at [OurWorldInData.org](https://ourworldindata.org). Retrieved from: '<https://ourworldindata.org/coronavirus>'
20. World Health Organization & United Nations Children's Fund. Monitoring COVID-19 Vaccination. Monit COVID-19 Vaccin considerations Collect use Vaccin data interim Guid 3 March 2021 World Heal Organ. 2021;