SciELO Preprints

Publication status: This preprint has been published elsewhere.
DOI of the published preprint: https://doi.org/10.1590/1413-812320263110.16232026en

The political context of COVID-19 vaccination in Brazil: evidence from a nationwide population-based study

Romina Buffarini, Cesar G Victora, Pedro Curi Hallal, Mariângela Freitas Silveira

https://doi.org/10.1590/SciELOPreprints.17941

Submitted on: 2026-09-03
Posted on: 2026-09-04 (version 1)
(YYYY-MM-DD)

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941

The political context of COVID-19 vaccination in Brazil: evidence from a nationwide population-based study

Romina Buffarini[1], Cesar G Victora[2], Mariângela F Silveira[1], Pedro C Hallal[3]

[1] Post-Graduate Program in Epidemiology, Federal University of Pelotas, RS, Brazil

[2] International Center for Equity in Health, Federal University of Pelotas, Pelotas, Brazil

[3]Department of Health and Kinesiology, University of Illinois Urbana-Champaign, Urbana, Illinois, USA

Romina Buffarini
ORCID: https://orcid.org/0000-0002-6905-8767

Cesar Gomes Victora
ORCID: https://orcid.org/0000-0002-2465-2180

Pedro Curi Hallal
ORCID: https://orcid.org/0000-0003-1470-6461

Mariângela Silveira
ORCID: https://orcid.org/0000-0002-2861-7139

Corresponding author (for publication): Pedro Curi Hallal. Department of Health and Kinesiology, College of Applied Health Sciences, University of Illinois Urbana-Champaign, 906 S. Goodwin Ave., Urbana, IL 61801, USA. Email: prchallal@gmail.com

Keywords: SARS-CoV-2; Vaccinations; Covid-19 vaccines; Politics; Public Health; Brazil

Abstract

We examined the association between political context and COVID-19 vaccination in Brazil by linking individual vaccination data from 33,320 participants in the nationally representative EPICOVID-19 II study with municipal electoral data from the second round of the 2022 presidential election. Municipal political context was measured by the proportion of valid votes for the Partido Liberal (PL) presidential candidate in the second round. Complete COVID-19 vaccination was defined as receipt of two or more doses.

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941

Higher municipal support for the PL candidate was associated with lower vaccination coverage (r = -0.37). Each 10-percentage-point increase in PL vote share was associated with lower odds of complete vaccination (OR 0.76; 95% CI 0.72–0.81). A weaker association was also observed for influenza vaccination (OR 0.88; 95% CI 0.82–0.95). These findings suggest that political and informational environments may influence vaccination behaviors and should be considered in future public health communication strategies, particularly in politically polarized settings.

Comment

During the COVID-19 pandemic, vaccination became not only a public health issue, but also a political and social debate [1]. In many countries, political polarization appeared to influence health behaviors, including adherence to vaccination campaigns [2, 3]. Understanding these dynamics may be important for future public health emergencies, especially in highly polarized societies such as Brazil.

Studies from the United States, reported substantial differences in vaccination coverage between politically distinct communities, suggesting that political affiliation may be an important predictor of vaccine behavior [4, 5]. The evidence also suggested that conservative political beliefs were associated with lower trust in health authorities and government institutions, lower perception of disease severity, and greater concerns about vaccine safety and side effects [2]. In addition, social norms may also contribute to these patterns, since people living in politically similar environments may reinforce shared beliefs and behaviors related to vaccination [6, 7].

A previous Brazilian ecological study reported an inverse association between municipal support for the PL presidential candidate and a COVID-19 vaccination index based on the number of doses administered (at the municipal levels) in municipalities with lower human development index[8].

Our study builds on this evidence by using individual vaccination data from EPICOVID-19 II[9], a large nationally representative population-based survey. The availability of standardized individual-level information on the complete vaccine scheme provides a robust source for estimating vaccination coverage across the surveyed municipalities[8]. Therefore, we aimed to examine the relationship between political context and vaccine uptake in Brazil in the second round of the 2022 presidential election, which involved only two opposing candidates. The election took place in a context of intense political polarization and public debate regarding COVID-19 vaccines and pandemic-related policies, during the administration of former right-wing president from Partido Liberal (PL) party. The analysis combined individual-level health data with aggregate municipal-level electoral data. Political alignment was measured as a contextual municipal-level exposure using official data from the Brazilian Superior Electoral Court, based on the

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941

percentage of valid votes cast for the PL presidential candidate in the second round of the 2022 presidential election. The outcome was COVID-19 vaccination status, defined as having received two or more doses). To account for the hierarchical structure of the data (individuals nested within municipalities) and the complex sampling design of EPICOVID-19 BR II, data were analyzed using survey-set logistic regression models (svy). Models were adjusted for municipal-level sociodemographic and economic characteristics obtained from the Brazilian Institute of Geography and Statistics (IBGE), using 2022 Census data and official municipal indicators. These covariates included sex composition, age structure, racial/skin color composition, and mean nominal monthly household income per capita (municipal household income per capita).

We observed an inverse association between municipal support for the right-wing PL candidate and COVID-19 vaccination coverage (linear correlation r= -0,37). Municipalities with higher proportions of votes for the PL candidate tended to show progressively lower vaccination coverage levels (**Fig1 (A)**). Because the association was not linear, we used a logit transformation for vaccine coverage. **Fig 1(B)** shows that each 10-percentage-point increase in the PL vote share was associated with lower odds of complete vaccination scheme (OR 0.76, 95% CI 0.72; 0.81). PL vote share was also associated, albeit less strongly, with influenza vaccine coverage (OR 0.88, 95% CI 0.82-0.95), suggesting that COVID-19 vaccine hesitancy had a spillover effect on other immunizations. Although our analysis does not allow conclusions at the individual level, the ecological approach provides important insights into how social and political environments may influence health behaviors at the population level. Brazil represents a particularly interesting setting for this discussion because political debates around COVID-19 vaccines were intense during the pandemic [8, 10]. Conflicting public messages, misinformation, and distrust in institutions may have contributed to differences in vaccination behavior in the population. In this sense, political environments may function as local contexts shaping collective perceptions/attitudes about vaccination.

Our findings have potential implications for future vaccination campaigns and health communication strategies. Public health interventions may need to consider not only access to vaccines but also the political and informational environments in which people live. Strategies based on trust-building and community engagement could be especially important in politically polarized settings. Monitoring political factors of vaccine uptake may help strengthen responses to future health crises.

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941

Authors Contributions:

Romina Buffarini and Cesar Gomes Victora: Methodology.

Romina Buffarini: Formal analysis, Writing – original draft.

Mariângela Freitas da Silveira: Methodology, Investigation

Cesar Gomes Victora and Pedro Curi Hallal: Conceptualisation, Methodology, Investigation, Project administration.

Pedro Curi Hallal: Funding Acquisition

All authors: Interpretation of the findings, Writing – review & editing, and approval of the final version of the manuscript

Funding: Ministry of Health, through Decentralized Execution Agreement No. 25/2023.

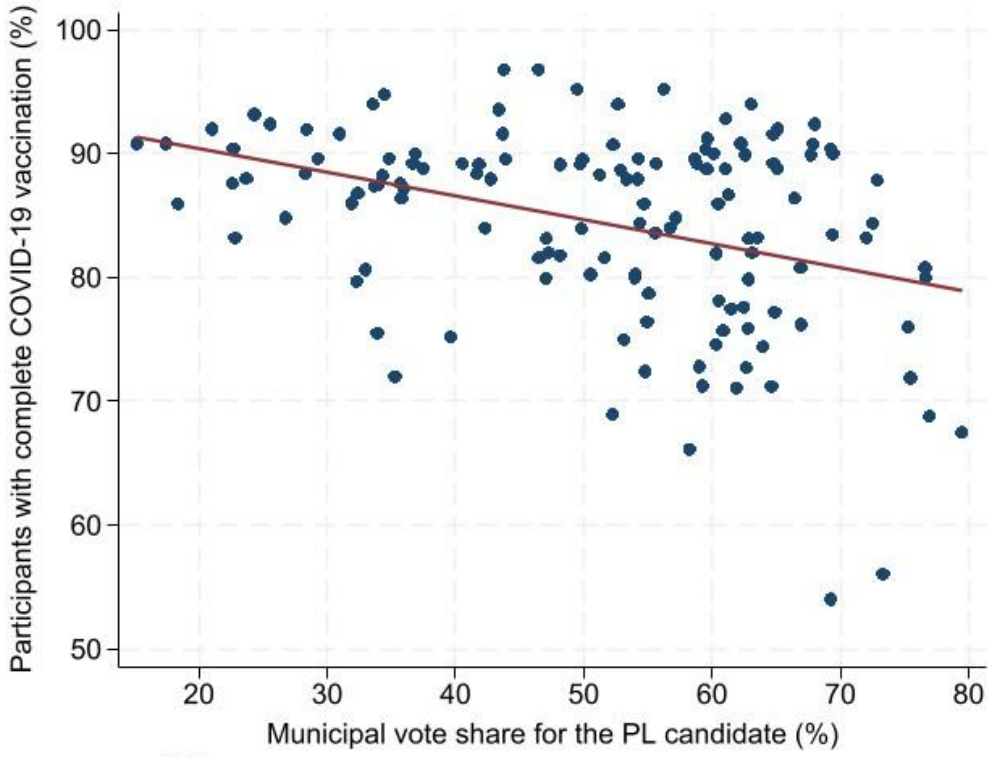
Ethics: The study was approved by the Research Ethics Committee of the School of Physical Education at the Federal University of Pelotas (CAAE: 68382923.8.0000.5313). Participants provided written informed consent.

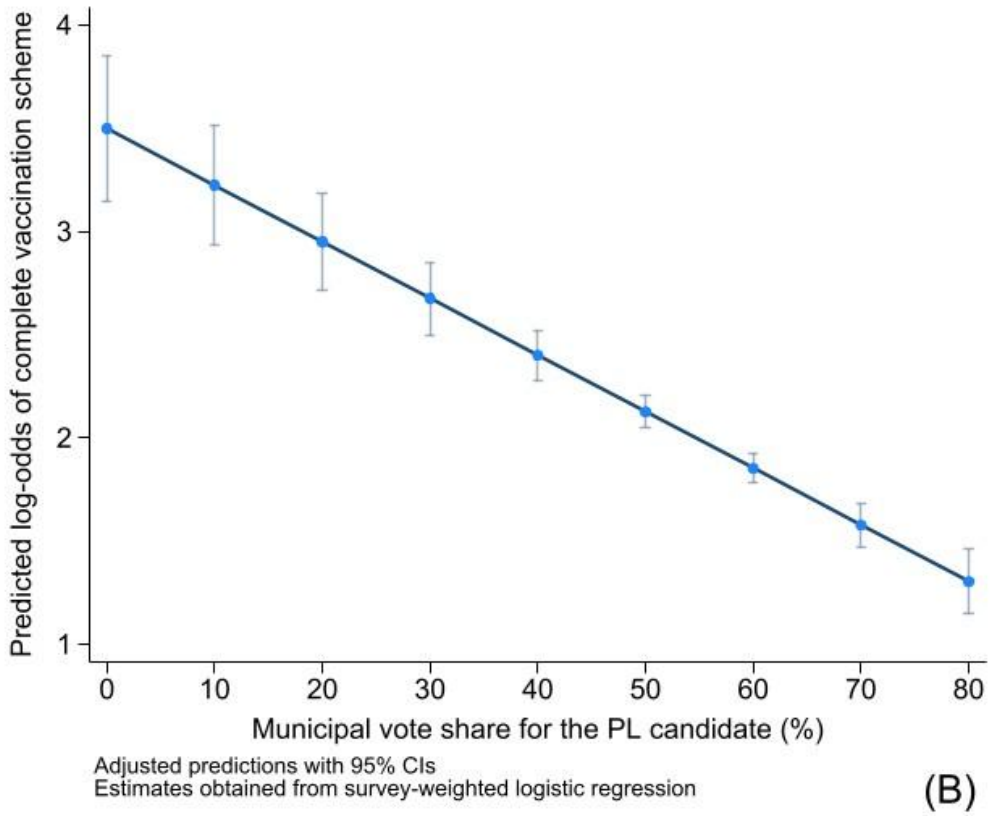
Conflicts of interest: none to declare

Declaration of data availability/ Declaração de disponibilidade de dados da pesquisa: The data used in this study are available at: https://epidemio-ufpel.org.br/epicovid/

Use of artificial intelligence: Artificial intelligence tools were used solely to assist with English grammar and language revision.

SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941





SciELO Preprints - This document is a preprint and its current status is available at: https://doi.org/10.1590/SciELOPreprints.17941

Fig 1. (A) COVID-19 vaccination coverage (2 or more doses) according to municipal vote share for the PL candidate in the second round of the 2022 presidential election; each dot represents one municipality. **(B)** Adjusted predicted log-odds of coverage for each 10-percentage-point increase in votes for the PL.

References

1. Henkel L, Sprengholz P, Korn L, Betsch C, Böhm R. The association between vaccination status identification and societal polarization. Nature Human Behaviour. 2023;7(2):231-9.
2. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, et al. A global survey of potential acceptance of a COVID-19 vaccine. Nature medicine. 2021;27(2):225-8.
3. Martins-Filho PR, Barberia LG. The unjustified and politicized battle against vaccination of children and adolescents in Brazil. The Lancet Regional Health–Americas. 2022;8.
4. Chen Y. How do religious and political beliefs predict COVID-19 vaccination behavior among US college students? A study using the health belief model. American Journal of health promotion. 2023;37(6):786-95.
5. Ricke IJ, Spaulding AB, Rajtar NN, Lundberg L, Nguyen RH. Political affiliation, policy measures, and intention to receive covid-19 and influenza vaccines. International journal of environmental research and public health. 2024;21(12):1608.
6. Cornwall W. Officials gird for a war on vaccine misinformation. Science. 2020;369(6499):14-5.
7. Konstantopoulos A, Dayton L, Latkin C. The politics of vaccination: a closer look at the beliefs, social norms, and prevention behaviors related to COVID-19 vaccine uptake within two US political parties. Psychology, health & medicine. 2024;29(3):589-602.
8. Seara-Morais GJ, Avelino-Silva TJ, Couto M, Avelino-Silva VI. The pervasive association between political ideology and COVID-19 vaccine uptake in Brazil: an ecologic study. BMC Public Health. 2023;23(1):1606.
9. Wehrmeister FC, Menezes AM, Dalcolmo M, Prendergast EC, Batista TG, Leão OAdA, et al. A countrywide study on post-COVID-19 condition in Brazil: the Epicovid 2.0. International Journal of Epidemiology. 2026;55(Supplement_1):i31-i40.
10. Gramacho WG, Turgeon M. When politics collides with public health: COVID-19 vaccine country of origin and vaccination acceptance in Brazil. Vaccine. 2021;39(19):2608-12.

This preprint was submitted under the following conditions:

- The authors declare that the necessary Terms of Free and Informed Consent of participants or patients in the research were obtained and are described in the manuscript, when applicable.
- The authors declare that the preparation of the manuscript followed the ethical norms of scientific communication.
- The authors declare that they are aware that they are solely responsible for the content of the preprint and that the deposit in SciELO Preprints does not mean any commitment on the part of SciELO, except its preservation and dissemination.
- The authors declare that the data, applications, and other content underlying the manuscript are referenced.
- The deposited manuscript is in PDF format.
- The authors declare that the research that originated the manuscript followed good ethical practices and that the necessary approvals from research ethics committees, when applicable, are described in the manuscript.
- The authors declare that once a manuscript is posted on the SciELO Preprints server, it can only be taken down on request to the SciELO Preprints server Editorial Secretariat, who will post a retraction notice in its place.
- The authors agree that the approved manuscript will be made available under a Creative Commons CC-BY license.
- The submitting author declares that the contributions of all authors and conflict of interest statement are included explicitly and in specific sections of the manuscript.
- The authors declare that the manuscript was not deposited and/or previously made available on another preprint server or published by a journal.
- If the manuscript is being reviewed or being prepared for publishing but not yet published by a journal, the authors declare that they have received authorization from the journal to make this deposit.
- The submitting author declares that all authors of the manuscript agree with the submission to SciELO Preprints.