Children vaccination as a population strategy to increase COVID-19 vaccine coverage in Brazil

Raphael Mendonça Guimarães

Fundação Oswaldo Cruz (FIOCRUZ), National School of Public Health, Department of Social Sciences | Fiocruz COVID-19 Observatory. Rio de Janeiro, RJ, Brazil

The Lancet Regional Health - Americas 2022;8: 100240
Published online 26 March 2022
https://doi.org/10.1016/j.lana.2022.100240

Throughout the history of public health, vaccines have been one of the most effective and efficient strategies for controlling infectious diseases.[1] Vaccination against COVID-19 started in Brazil on January 17th, 2021.[2] It happened late if compared to the rest of the world. Conversely, the country has been gradually expanding coverage, at levels higher than even developed countries, such as Germany and France.[3] As of the beginning of March 2022, Brazil has immunized 80.2% of its population with one dose. Regarding complete immunization (2 doses applied or single dose), the country covered 72.0% of all population. In addition, Brazil got 28.5% of booster coverage.[4]

Brazil faced different vaccination phases, with varying growth rates of coverage curve. In particular, the first dose coverage curve demonstrates the saturation of the vaccination strategy in the general population. In Brazil, it remained stagnant since September 20th, 2021. At that point, the vaccination's first dose coverage level was 66.7%. Since then, deceleration has been the hallmark of this new phase, for which we obtained the velocity from the segmented regression analysis (Figure 1a). On January 13th, 2022, the first dose vaccination reached 75.9% after 16 weeks of a prolonged increase.

Up to that time, the population eligible for vaccination (over 11 years old) corresponded to 84.2% of the total population (Figure 1b). This means that even if all people aged 12 and over were immunized, this would still be far from the desired minimum number of 90%.[5] In fact, the expansion of vaccination in the population would only occur with a change in strategy. And it took place on January 14th, 2022, when children were included in the eligible population. This moment represents a milestone for the country. And it needs to be looked at as the possibility of expanding population coverage of vaccination. So far, after the beginning of children's vaccination, the first dose coverage curve increased again4. This age group represents 9.65% of the total population. Thus, with the inclusion of this group, 93.59% of the Brazilian population is now eligible for vaccination. It is a better horizon, and for now, this becomes the new immunization goal at the national level.

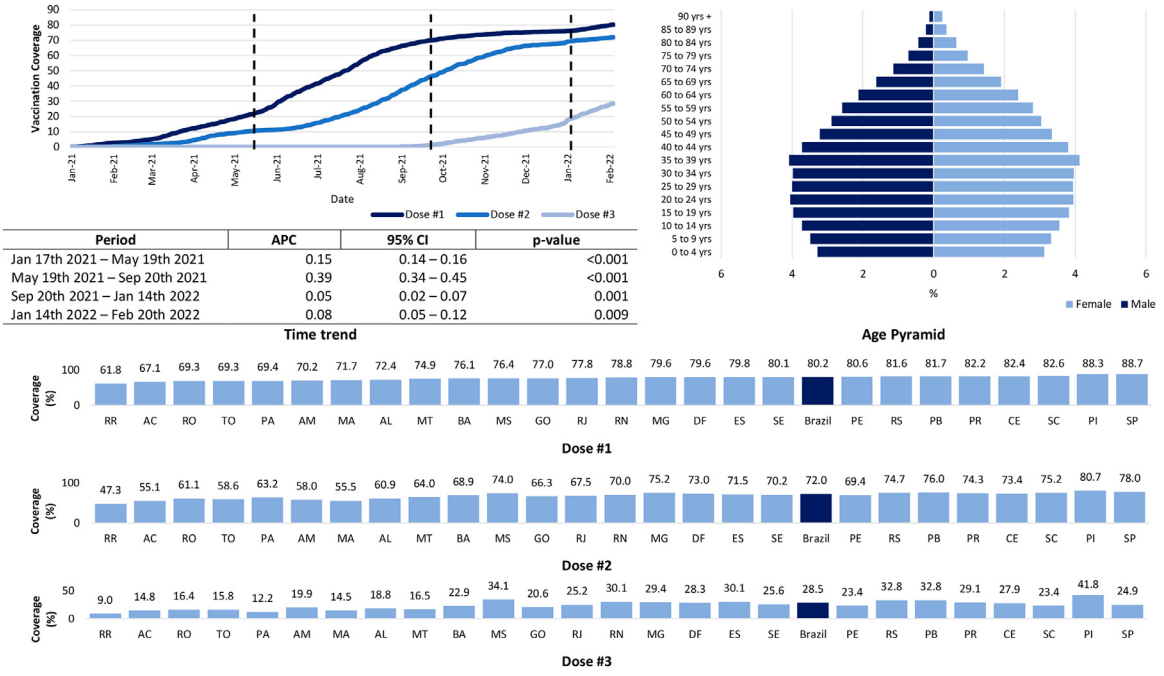
Equally important, vaccination coverage is not homogeneous across the country. For the first dose, there is a range from 61.8% (Roraima) to 88.7% (São Paulo) (Figure 1c). For the second dose, the discrepancy is even more remarkable: 47.3% (Roraima) to 80.7% (Piauí) (Figure 1d). And for the booster dose, the difference is brutal, with coverage in Roraima (9.0%) almost five times lower than in Piauí (41.8%) (Figure 1e). It is not a coincidence that the states with the lowest vaccination coverage have the youngest populations in the country. That said, there is the potential to increase vaccination coverage in these settings and reduce discrepancies as fast as childhood vaccination adherence grows.

Unfortunately, children's vaccination in Brazil started late and was surrounded by controversies generated by the spread of fake news.[6] Immunization for the age group between 5 and 11 years has found parents reticent about its efficacy and safety, despite the widely available evidence in its favor.[7] The consequence of this process is the slowness with which the country advances in the vaccination coverage of children. After a month since it started, Brazil got only 21% of children vaccinated. The context could not be more worrying: the face-to-face return of school activities and the disincentive to the use of masks in several cities.

In addition to the individual benefit, we emphasize that the more children vaccinated, the greater the protection of the whole population. The urgency, at this moment, is to accelerate the distribution of vaccines to all Federation Units and the strengthening of a collaborative network that provides the necessary clarifications to the population, considering the vacuum created by the absence of campaigns to inform the parents about the individual and collective benefits of vaccination.

We conclude that the roadmap to overcome this stagnation curve is to push harder the vaccination of children between 5 and 11 years old and expand the age groups eligible for vaccination as soon as possible. We also consider essential to create strategies to increase the application of the first dose in people who live in remote places and mass information aimed at minimizing the anti-vaccine speech, fueled by the federal government, which fuels the uncertainty in some social segments.

E-mail address: raphael.guimaraes@fiocruz.br



Period	APC	95% CI	p-value
Jan 17th 2021 – May 19th 2021	0.15	0.14 – 0.16	<0.001
May 19th 2021 – Sep 20th 2021	0.39	0.34 – 0.45	<0.001
Sep 20th 2021 – Jan 14th 2022	0.05	0.02 – 0.07	0.001
Jan 14th 2022 – Feb 20th 2022	0.08	0.05 – 0.12	0.009

Figure 1. Vaccination coverage and population metrics in Brazil: (a) time series to each vaccine dose and segmented regression trend for 1st dose; (b) Brazil 2021 age pyramid; state distribution of (c) 1st dose; (d) 2nd dose; (e) 3rd dose.

APC — Average Percentual Change; 95% CI — 95% confidence interval; States: RR — Roraima; AP — Amapá; AC — Acre; MA — Maranhão; AM — Amazonas; TO — Tocantins; PA — Pará; RO — Rondônia; AL — Alagoas; MT — Mato Grosso; MS — Mato Grosso do Sul; BA — Bahia; GO — Goiás; RN — Rio Grande do Norte; RJ — Rio de Janeiro; DF — Distrito Federal; SE — Sergipe; PE — Pernambuco; ES — Espírito Santo; PB — Paraíba; CE — Ceará; RS — Rio Grande do Sul; MG — Minas Gerais; PR — Paraná; SC — Santa Catarina; PI — Piauí; SP — São Paulo.

Contributors

Raphael Mendonça Guimarães contributed to the conception, data exploring, writing and review of the final version.

Funding

None.

Data sharing statement

The data were obtained through secondary public access databases, available at: https://opendatasus.saude.gov.br/dataset/covid-19-vacinacao.

Declaration of interests

Raphael Mendonça Guimarães declares that he has no monetary, political, or institutional conflict of interest.

References

1 Zhang Y, Fisk RJ. Barriers to vaccination for coronavirus disease 2019 (COVID-19) control: experience from the United States. *Glob Health J*. 2021;5(1):51–55.

2 Boschiero MN, Palamim CVC, Marson FAL. The hindrances to performing the COVID-19 vaccination in Brazil. *Hum Vaccin Immunother*. 2021:1–16.

3 de Figueiredo A, Simas C, Karafillakis E, Paterson P, Larson HJ. Mapping global trends in vaccine confidence and investigating barriers to vaccine uptake: a large-scale retrospective temporal modelling study. *Lancet*. 2020;396(10255):898–908.

4 MonitoraCovid Fiocruz. COVID-19 vaccination coverage [Homepage] Rio de Janeiro: Fundação Oswaldo Cruz. Available at: https://bigdata-covid19.icict.fiocruz.br/. Accessed 10 March 2022.

5 Coccia M. Optimal vaccination levels to reduce COVID-19 infected individuals and deaths: a global analysis. *Environ Res*. 2022;204:(Pt C) 112314.

6 Martins_Filho PR, Barberia LG. The unjustified and politicized battle against vaccination of children and adolescents in Brazil. *Lancet Reg Health Am*. 2022;8: 100206.

7 Walter EB, Talaat KR, Sabharwal C, et al. Evaluation of the BNT162b2 COVID-19 vaccine in children 5 to 11 years of age. *N Engl J Med*. 2021;386(1):35–46.