

## Inequalities in child immunization coverage: potential lessons from the Guinea-Bissau case

Desigualdades na cobertura vacinal infantil:  
potenciais lições do caso da Guiné-Bissau

Desigualdades en la cobertura de vacunación  
infantil: potenciales lecciones del caso de  
Guinea-Bissau

Beatriz Raffi Lerm <sup>1</sup>  
Yanick Silva <sup>1</sup>  
Bianca O. Cata-Preta <sup>2</sup>  
Camila Giughiani <sup>1</sup>

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### Abstract

*Immunization is one of the main interventions responsible for the decline in under-5 mortality. This study aimed to assess full immunization coverage trends and related inequalities, according to wealth, area of residence, subnational regions, and maternal schooling level in Guinea-Bissau. Data from the 2006, 2014, and 2018 Guinea-Bissau Multiple Indicator Cluster Surveys (MICS) were analyzed. The slope index of inequality (SII) was estimated by logistic regression for wealth quintiles and maternal schooling level as a measure of absolute inequality. A linear regression model with variance-weighted least squares was used to estimate the annual change of immunization indicators at the national level and for the extremes of wealth, maternal schooling level, and urban-rural areas. Full immunization coverage increased by 1.8p.p./year (95%CI: 1.3; 2.3) over the studied period. Poorer children and children born to uneducated mothers were the most disadvantaged groups. Over the years, wealth inequality decreased and urban-rural inequalities were practically extinguished. In contrast, inequality of maternal schooling level remained unchanged, thus, the highest immunization coverage was among children born to the most educated women. This study shows persistent low immunization coverage and related inequalities in Guinea-Bissau, especially according to maternal schooling level. These findings reinforce the need to adopt equity as a main principle in the development of public health policies to appropriately reduce gaps in immunization and truly leave no one behind in Guinea-Bissau and beyond.*

*Child Health; Healthcare Disparities; Immunization; Vaccines*

### Correspondence

B. R. Lerm  
Universidade Federal do Rio Grande do Sul,  
Rua Ramiro Barcelos 2400, Porto Alegre, RS  
90035-003, Brasil.  
bialerm@gmail.com

<sup>1</sup> Universidade Federal do Rio Grande do Sul,  
Porto Alegre, Brasil.

<sup>2</sup> Universidade Federal de Pelotas, Pelotas, Brasil.



## Introduction

Global under-5 mortality rate decreased by 59% from 1990 to 2019 mainly due to immunization, a basic human right <sup>1</sup>. In childhood, vaccines play an important role to provide immunity before the exposure to potentially life-threatening diseases, such as measles, diphtheria, and tetanus <sup>2</sup>. Despite the advances in reducing mortality, which is an indicator of the development of a country, they are still insufficient and wide inequalities in immunization coverage can be observed among and within countries. Western and Central Africa remain the regions with the highest under-5 mortality rates in the world <sup>3</sup> and the lowest coverage against diphtheria-tetanus-pertussis (DTP3), which is used as a proxy for full immunization coverage <sup>4</sup>.

If Guinea-Bissau, a country in this region, keeps the current pace, it will only achieve the *Sustainable Development Goal* (SDG) of 25 deaths or less per 1,000 live births in 2048 <sup>1</sup>. Therefore, to accelerate this progress, efforts must be made to ensure full immunization coverage for all. Guinea-Bissau was deeply explored as a colony, and its independence from Portugal dates back to 1974, following a historical pattern of not receiving much in return, with minimal investments toward its own development <sup>5</sup>. Moreover, Guinea-Bissau is known for its political instability, which hindered its overall performance and led to repeated unsuccessful attempts to establish a solid and sustainable health system <sup>6</sup>. The Guinea-Bissau's Ministry of Health, with support from international agencies, such as the World Bank, the World Health Organization (WHO), and GAVI, the Vaccine Alliance, is responsible for the immunization program. Vaccines are provided free of charge in health centers and outreach services <sup>7</sup> and the program is implemented via routine vaccinations, specific campaigns and catch-up <sup>8</sup> and mop-up <sup>9</sup> campaigns. The immunization schedule includes one dose of the Bacillus Calmette-Guérin (BCG) vaccine at birth, followed by three doses of the DTP vaccine and oral polio vaccines (OPV) at 6, 10, and 14 weeks of age and one dose of measles vaccine at nine months of age <sup>10</sup>.

In line with the SDGs, the WHO implemented the Immunization Agenda 2030, which includes the provision of equitable access, not only among countries, but also within countries. Its success requires data-based interventions that consider estimates and trends of the diverse social inequalities, based on wealth, area of residence, and schooling level, for example, in order to prioritize and adapt strategies to provide life-saving vaccines to all children <sup>2,11</sup>.

To our knowledge, there has been no study investigating the trends of inequalities in the immunization coverage of children in Guinea-Bissau. Thus, this study aimed to analyze inequalities in wealth, area of residence, maternal schooling level, and subnational regions in full immunization coverage over the years in this African country, as an effort that can be replicated for other countries. The inverse equity hypothesis states that newly introduced health interventions initially reach wealthier groups – who need fewer interventions – and then, when these groups achieve reasonable access, the poorest are benefited <sup>12</sup>. Based on this hypothesis, we aim to find a progression from a marked social gradient with higher full immunization coverage among the most privileged groups to a more equitable full immunization coverage among groups over time.

## Methods

### Data source and study sample

The *Multiple Indicator Cluster Survey* (MICS) is an important source of nationally representative data for the development of indicators of well-being of children and women from low- and middle-income countries. This study was based on the 2006, 2014, and 2018 Guinea-Bissau MICS, which used a multi-stage cluster sampling method. The detailed methodology is available online (<http://mics.unicef.org/>). A total of 1,269 children aged from 12 to 23 months in 2006, 1,591 in 2014, and 1,409 in 2018 were included.

## **Immunization indicators**

Full immunization coverage was presented as the percentage of children aged 12 to 23 months who received one dose of the BCG and measles-containing vaccines (MCV) and three doses of DTP3 and OPV3, excluding the dose given at birth, as recommended by WHO<sup>13</sup>. Each vaccine (BCG, MCV, DTP3, and OPV3) was also used individually as an outcome of this study.

Information on the immunization status of children was obtained from their vaccination card or, if unavailable, their mother's or caregiver's report. This study also used MICS data instead of national administrative data, since they provide denominators to estimate immunization indicators.

## **Statistical analysis**

The national coverage and its corresponding 95% confidence interval (95%CI) were estimated for all immunization indicators in all survey years. For full immunization coverage, four dimensions of inequality were considered: wealth quintiles, maternal schooling level (uneducated, primary education, or secondary or higher education), area of residence (urban or rural), and subnational regions (first-level administrative country subdivisions). Since the classification of subnational regions changed after 2006, this study considered the two last survey years (2014 and 2018) in Bafatá, Biombo, Bolama/Bijagós, Cacheu, Gabú, Oio, Quinara, Bissau, and Tombali. As a measure of absolute inequality, the slope index of inequality (SII) was estimated for wealth quintiles and maternal schooling level.

The household wealth index, which was estimated using MICS data, is based on principal component analysis<sup>14</sup> from variables of building characteristics, such as materials used for the walls, floors, and roofs, water supply and sanitary facility, and household assets (TVs and refrigerators, for example), and variables related to economic status. Two separated analyses were conducted for urban and rural households, considering differences in asset ownership and their importance, and they were later combined into a single score. Wealth index scores were divided into five groups of equal population size (quintiles). The first quintile represented the poorest 20% of households and the fifth quintile the wealthiest 20%. Since the analytic sample was limited to children aged 12 to 23 months, quintile sizes may not be exactly the same size.

SII was estimated by logistic regression, which allowed estimating the absolute difference in full immunization coverage, in percentage points (p.p.), between the extremes of wealth or schooling level<sup>15</sup>. It was expressed on a scale from -100 to +100, with zero representing full equality. Negative values represented a higher coverage among poor groups or children born to uneducated women and positive values represented a higher coverage among wealthy groups or children born to women with secondary or higher schooling level.

A linear regression with variance-weighted least squares was used to estimate the annual change of immunization indicators at the national level and for the extremes of wealth, maternal schooling level, and urban-rural areas. To test heterogeneity between subnational regions, the  $\chi^2$  test was used for both crude and adjusted coverage (for wealth, maternal schooling level, and area of residence).

Analyses were performed using Stata 17.0 (<https://www.stata.com>) as part of the multistage survey design, including sampling weights and clustering. Map charts were created using Microsoft 365 Excel (<https://products.office.com/>). Databases were organized according to the International Center for Equity in Health (<http://www.equidade.org>).

## **Ethical clearance**

The institutions that administered the surveys were responsible for ethical clearance, which can be found in published reports<sup>16</sup>. Since secondary data from these surveys were used, this study did not require ethical approval.

## Results

We included 4,269 children in this study, most of them living in rural areas and born to uneducated mothers. In 2018, the BCG vaccine had the highest coverage and measles had the lowest coverage. DTP3 and OPV3 coverage significantly improved and was the main responsible for increasing full immunization coverage by 1.8p.p./year (95%CI: 1.3; 2.3) (Table 1).

In the three survey years, the poorest and children born to uneducated mothers were the most disadvantaged groups in terms of full immunization coverage. Full immunization coverage increased in all wealth quintiles from 2006 to 2014 and remained steady since then (Figure 1). Full immunization coverage increased by 2.2p.p./year for the poorest children and 1.0p.p./year for the wealthiest, resulting in a reduction of inequality (Table 2). However, the coverage among wealthy groups was still higher (Figure 1).

**Table 1**

Sample characteristics, national immunization coverage, and annual change of the BCG, measles, DTP3, and OPV3 vaccines, and full immunization coverage. Guinea Bissau, 2006, 2014, and 2018.

	2006 [n = 1,269]		2014 [n = 1,591]		2018 [n = 1,409]		Annual change *	
	Prevalence (%)	95%CI	Prevalence (%)	95%CI	Prevalence (%)	95%CI	p.p.	95%CI
Child's sex								
Boy	50.8	47.8; 53.9	51.1	47.2; 55	48.5	45.7; 51.4		
Girl	49.2	46.1; 52.2	48.9	45.0; 52.8	51.5	48.6; 54.3		
Area of residence								
Urban	29.3	23.2; 36.3	38.0	33.9; 42.3	26.1	22.7; 29.9		
Rural	70.7	63.7; 76.8	62.0	57.7; 66.1	73.9	70.1; 77.3		
Maternal schooling level								
Uneducated	70.4	66.3; 74.2	53.1	49.4; 56.7	52.4	48.2; 56.6		
Primary	21.6	18.7; 24.8	30.1	26.5; 34.0	30.6	27.3; 34.2		
Secondary or higher education	8.0	6.2; 10.4	16.8	13.9; 20.3	16.9	14.6; 19.6		
Wealth quintile								
Q1	21.7	18.4; 25.4	22.7	19.7; 26.1	21.6	18.9; 24.6		
Q2	23.8	20.5; 27.5	22.2	19.3; 25.3	23.2	20.6; 26.0		
Q3	20.7	17.7; 24.1	22.0	19.0; 25.4	22.3	18.9; 26.1		
Q4	19.1	15.7; 23.1	19.6	15.6; 24.3	19.2	16.2; 22.6		
Q5	14.6	11.4; 18.5	13.5	10.9; 16.5	13.7	11.2; 16.5		
Gini index	**		50.7		50.7			
	Coverage (%)	95%CI	Coverage (%)	95%CI	Coverage (%)	95%CI	p.p.	95%CI
Immunization indicator								
BCG	88.7	86.1; 90.8	93.5	91.5; 95.0	94.2	91.9; 95.8	0.5	0.2; 0.7
Measles	75.1	71.4; 78.4	81.2	77.2; 84.6	75.5	71.8; 78.9	0.1	-0.3; 0.5
DTP3	70.8	67.0; 74.4	88.1	85.6; 90.2	84.4	81.4; 87.0	1.2	0.8; 1.6
OPV3	58.3	54.3; 62.1	76.8	73.7; 79.6	81.4	78.5; 84.0	1.9	1.5; 2.3
FIC	48.7	44.4; 53.0	68.8	64.7; 72.6	69.8	66.2; 73.2	1.8	1.3; 2.3

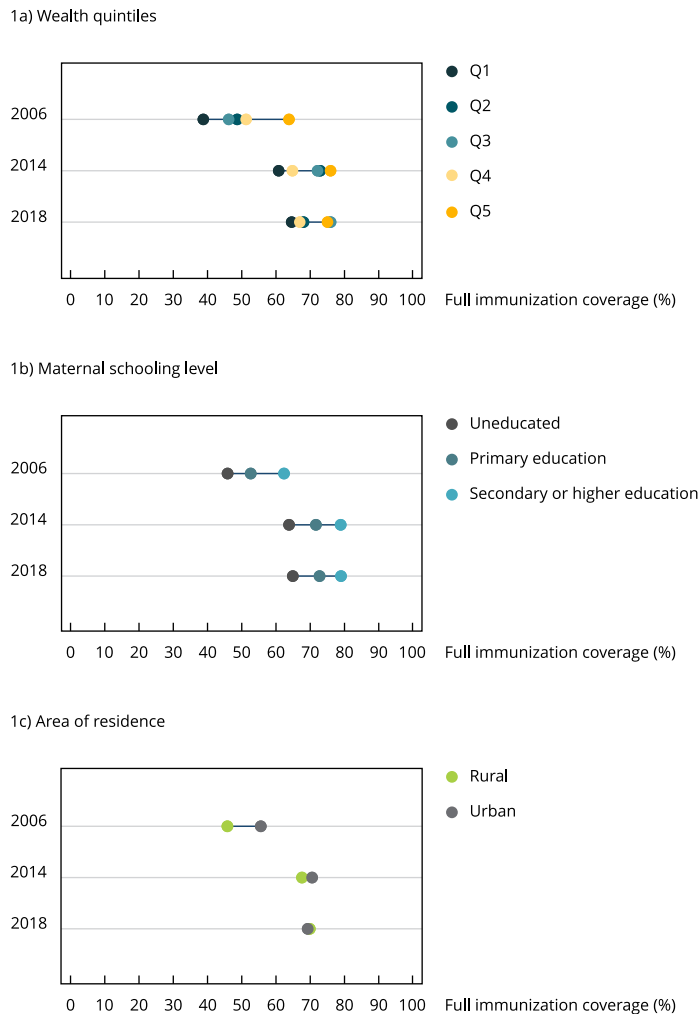
95%CI: 95% confidence interval; BCG: Bacillus Calmette-Guérin; DTP3: three doses of the diphtheria-tetanus-pertussis vaccine; OPV3: three doses of the oral polio vaccine; p.p.: percentage point.

\* Applicable for BCG, DTP3, OPV3;

\*\* Data not available.

**Figure 1**

Full immunization coverage stratified by wealth quintiles, maternal schooling level, and area of residence. Guinea Bissau, 2006, 2014, and 2018.



Urban-rural inequality reduced over the years due to an increase in full immunization coverage in both groups, especially in rural areas (2.0p.p./year in rural areas and 1.2p.p./year in urban areas). On the other hand, since full immunization coverage increased similarly for all schooling levels from 2006 to 2018, the inequality of maternal schooling level remained unchanged, with a higher coverage among children born to the most educated women (1.7p.p./year for children born to uneducated women and 1.4p.p./year for children born to women with secondary or higher schooling level).

Figure 2 shows full immunization coverage for each subnational region in Guinea-Bissau in 2014 and 2018. In 2014, full immunization coverage ranged from 59.4% in Bolama to 88% in Cacheu. In 2018, full immunization coverage decreased in Cacheu, Oio, and especially Tombali, where full immunization coverage decreased from 71.9% to 51.5%. In 2018, Bolama had the highest immunization coverage among all regions (80.3%). The index for Oio, which had the second lowest full immunization coverage in 2014, further decreased in 2018. No subnational region presented significant heterogeneity in full immunization coverage for both crude and adjusted coverage ( $p < 0.001$ ).

**Table 2**

Annual change in the coverage (in percentage points) of the BCG, measles, DTP3, and OPV3 vaccines, and full immunization coverage in the poorest and wealthiest children, born to women with no formal education and secondary or higher schooling level, and living in urban and rural areas.

Indicator	Poorest		Wealthiest		Uneducated		Secondary or higher		Urban		Rural	
	Annual change (p.p.)	95%CI	Annual change (p.p.)	95%CI	Annual change (p.p.)	95%CI	Annual change (p.p.)	95%CI	Annual change (p.p.)	95%CI	Annual change (p.p.)	95%CI
BCG	0.7	0.1; 1.3	-0.1	-0.3; 0.2	0.5	0.2; 0.8	0.0	-0.4; 0.5	0.2	-0.1; 0.5	0.7	0.4; 1.0
Measles	0.3	-0.5; 1.0	-0.8	-1.4; -0.1	0.1	-0.4; 0.6	-0.1	-0.9; 0.7	-0.5	-1.2; 0.1	0.4	-0.1; 0.9
DTP3	1.6	0.8; 2.3	0.4	-0.3; 1.1	1.3	0.8; 1.7	0.4	-0.4; 1.1	0.8	0.2; 1.4	1.4	0.9; 1.9
OPV3	2.6	1.8; 3.3	1.0	0.1; 1.8	1.9	1.4; 2.4	1.3	0.4; 2.2	1.4	0.7; 2.1	2.2	1.7; 2.7
Full immunization coverage	2.2	1.5; 3.0	1.0	0.0; 2.0	1.7	1.1; 2.3	1.4	0.3; 2.4	1.2	0.4; 2.0	2.0	1.5; 2.6

95%CI: 95% confidence interval; BCG: Bacillus Calmette-Guérin; DTP3: three doses of the diphtheria-tetanus-pertussis vaccine; OPV3: three doses of the oral polio vaccine; p.p.: percentage point.

## Discussion

Full immunization coverage increased over the studied period (1.8p.p./year; 95%CI: 1.3; 2.3), mainly due to the increase in OPV3 and DTP coverage. The poorest and children born to uneducated mothers were the most disadvantaged groups. Although full immunization coverage remained below the target established by the WHO (90% national coverage), over the years, wealth inequality reduced and urban-rural inequalities were practically extinguished, in accordance with the inverse equity hypothesis. In contrast, the inequality of maternal schooling level remained unchanged, with a higher coverage among children born to the most educated women.

To better understand these trends, we highlight the historical and political context of Guinea-Bissau. After many efforts to establish a national health strategy, guided by the 1993 National Health Policy, the National Plans of Sanitary Development (PNDS) was implemented in 1998, the same year of the outbreak of a political and military conflict<sup>17</sup>. As a consequence, foreign aid – which at that time was responsible for 90% of the health department's funding – reduced, further worsening the fragility of state institutions, destroying essential care infrastructure, promoting a progressive loss of health professionals due to emigration, and contributing to a lack of integrated development policies<sup>18</sup>. Therefore, the implementation of PNDS, which was supposed to occur from 1998 to 2002, extended until 2007.

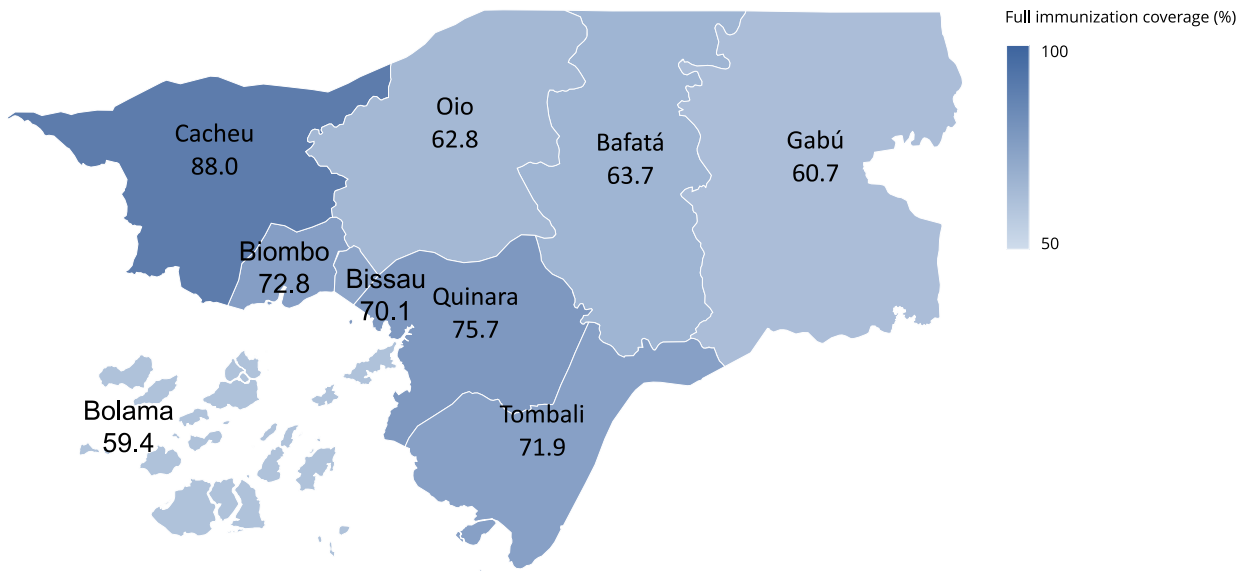
Our findings show that the increase in both full immunization coverage and the coverage of all vaccines individually improved mostly from 2006 to 2014 compared with results from 2014 to 2018, even considering the longer interval in the first studied period. This higher increase was especially due to improved DTP3 and OPV3 coverage and the scope of interventions at that time. In 2008, PNDS II was implemented (2008-2017), presenting an expanded program on immunization that aimed to improve access to basic health care and its quality, by analyzing the health situation and providing a national response to priority health problems. At that time, the global agenda focused on reducing inequalities between developed and underdeveloped countries<sup>19</sup>, under the Millennium Development Goals (MDGs). Moreover, immunization was one of the top priorities of PNDS II and at its end, the national immunization policy was created.

The second studied period (2014-2018) coincided with the end of the 15-year cycle of anti-poverty MDGs and the implementation of the SDGs, which changed the focus of the global agenda from inequalities only between countries to also within countries, along with its principle of leaving no one behind<sup>20,21</sup>. In 2019, three out of 11 regions had DTP coverage below the 80% target, which made the Guinea-Bissau Ministry of Health, with support of the United Nations Children's Fund (UNICEF),

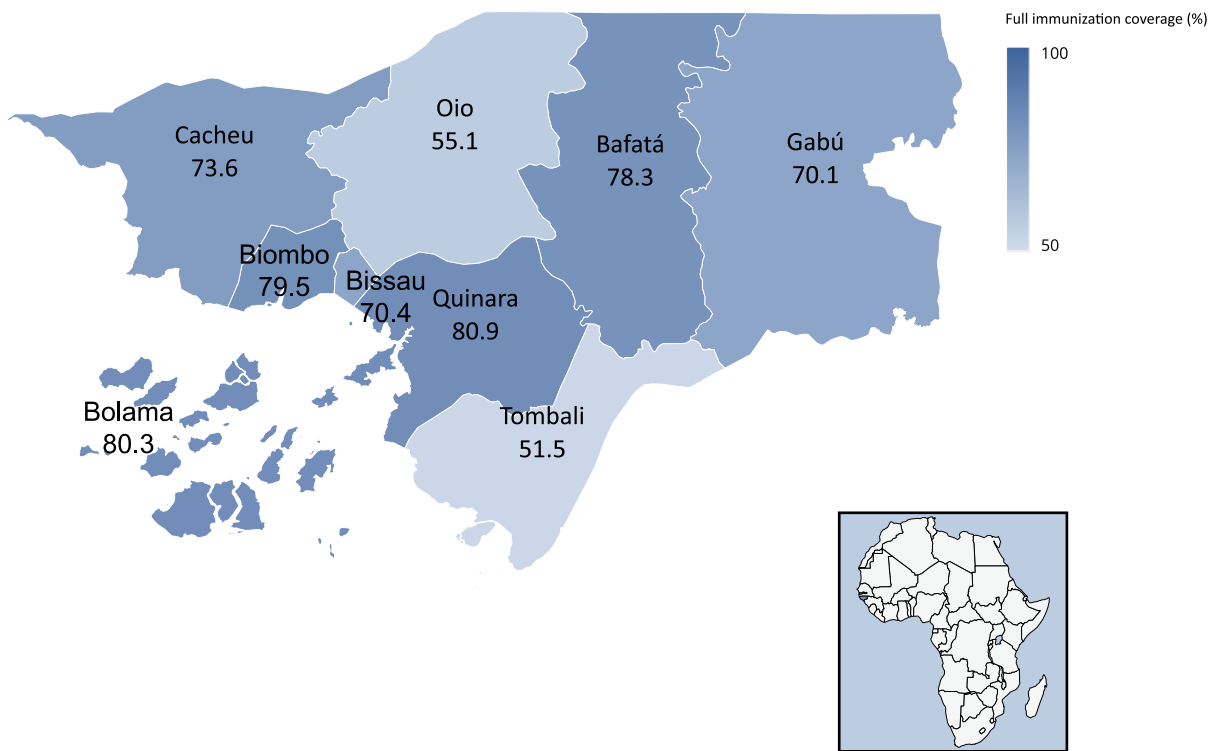
**Figure 2**

Full immunization coverage in subnational regions. Guinea Bissau, 2014 and 2018.

2a) 2014



2b) 2018



prioritize these regions in the following year<sup>10</sup>. This change of focus towards mitigating inequalities within countries may have influenced the decrease in national full immunization coverage after 2014.

Our findings are in accordance with the WHO, as it performed a change-over-time analysis in 28 countries, which was characterized as the annual absolute excess change between the richest and the poorest quintiles over an average period of 10 years. In this analysis, the situation of about two thirds of countries favored the poorest quintile. Similarly, most studied countries had an excess change that favored the rural subgroup<sup>6</sup>. Thus, although inequalities based on wealth and area of residence have been greatly reducing – which has also been previously observed in Bolivia, Colombia, El Salvador, Peru<sup>22</sup>, and Ghana<sup>23</sup> – much more progress is still needed.

The complex, persistent, and positive relationship between maternal schooling level and full immunization coverage also exists in several other low-income countries<sup>24,25,26</sup>. In India, this association remained after controlling for sociodemographic characteristics<sup>27</sup>. This level up relationship is due to the increase in basic health knowledge (as a consequence of having at least primary schooling level), a higher schooling level (secondary and higher), and the development of cultural capital, which would affect the adherence to immunization<sup>27</sup>. Therefore, a country's ultimate goal should be to invest heavily in education in order to increase overall women's education, which would positively affect the country in several social and health aspects<sup>28</sup>, including full immunization coverage inequalities. Moreover, improving the quality of health providers and providing information to promote maternal health literacy<sup>29</sup>, which is the ability of an individual to obtain and translate knowledge and information in order to maintain and improve health<sup>30</sup>, is of great importance.

Regarding changes in full immunization coverage according to regions of Guinea-Bissau (Figure 2), the lack of a clear pattern, with an increase in some regions and a decrease in others, may be due to an effort to increase immunization in regions with lower rates (Bolama, Bafatá, and Gabú), but this increase was at the expense of reducing the coverage in other regions (Cacheu and Tombali). However, this hypothesis does not include Oio, where full immunization coverage was already low in 2014 and further decreased in 2018. The rates in Guinea-Bissau remained steady, which suggests that the efforts might have been directed to regions outside the capital and more remote areas, which shows how challenging it might be for a country with limited financial resources to invest in the neediest without setting back other locations. However, the third strategic priority from the international Immunization Agenda (*Everyone is Protected by Full Immunization, Regardless of Location, Age, Socioeconomic Status or Gender-related Barriers*<sup>2</sup>) will be met only under these circumstances.

Differently from other Portuguese colonies, Guinea-Bissau was since the beginning treated mainly as a place to explore and extract natural resources and was not considered a fine place for settlement; thus, no significant investment was made in its human development, including health and education<sup>31</sup>. Guinea-Bissau is one of the most coup-prone countries in the world and the consecutive changes in the government raised unstable national health policies, weakening its autonomy and administrative self-capacity and reinforcing a donor-recipient culture. Although foreign aid plays an important and historical role in its health sector, most investments are vertical and program-specific, and generally applied only once, thus, the country does not have the support and human capital necessary to sustain the process. The persistent donor-recipient relationship brings partner-driven priorities with a limited policy buy-in, which in a long term, impairs a wider system effect and weakens the country's autonomy<sup>32,33</sup>. The GAVI support is planned according to each country's gross national income (GNI) per capita, which is used as a proxy of their ability to pay for the implementation of vaccines. Thus, the co-funding payments of each country vary and follow a transition model. In its latest report, GAVI shows that Guinea-Bissau is only in the initial self-funding phase of intervention, as it is a low-income country (GNI per capita > USD 1,025.00 in 2020), and is still far from the last and aimed phase (full self-funding), which represents a country with a strengthened health system and a strong and sustainable immunization programme<sup>34</sup>.

Therefore, the persistence of low and inequitable full immunization coverage distribution in Guinea-Bissau is a request for a stronger and more sovereign response, which goes beyond foreign aid and should include the strengthening of primary health care<sup>35</sup> in order to guarantee universal and equitable access to vaccines. Guinea-Bissau still has to face great challenges to be able to sustain a strong immunization program as an integral component of its health system, promoted by a widespread primary health care network. The lack of human resources, resulting in incomplete technical



teams and the closure of health centers nationwide, is a major obstacle <sup>36</sup>. However, our data show that maternal schooling level is a key factor that facilitates access to immunization. Thus, strategies to enhance education for the whole population, especially women, must be encouraged, and it requires actions that go beyond the health sector.

Our study had potential limitations. Firstly, it includes a possible recall bias, since in the absence of the children's vaccination card, we based immunization data on the mother's report. However, this is in accordance with the WHO recommendation on how to estimate immunization indicators and less than 4% of full immunization coverage points in all surveys were due to maternal recall; therefore, it is not a major source of bias in our analysis. Secondly, as the latest survey analyzed was performed in 2018, it may not represent the current situation of Guinea-Bissau, especially after the COVID-19 pandemic. Thirdly, full immunization coverage is an indicator that considers only the living children, thus, our study may include a possible survival bias. Finally, the lack of immunization data from the late 1990s could be a limitation, as it restricts a broader analysis of how military conflicts and political instability influenced full immunization coverage trends.

This study shows the persistent low immunization coverage and related inequalities in Guinea-Bissau, especially according to maternal schooling level. We used SII, a complex inequality measure that considers all subgroups and their population size. Our analysis can be replicated to other countries, as an effort to monitor immunization coverage from a perspective of equity. Inequalities are socially produced and, thus, preventable. Understanding them is an indispensable first step in this direction. More studies should use this kind of analysis to assess essential aspects for the design and update of policies that can truly close the gaps and leave no one behind.

## Contributors

B. R. Lerm contributed to the data analysis and writing and review of the article, and approved the final version of the manuscript. Y. Silva contributed to the study conception, data analysis, and review of the article, and approved the final version of the manuscript. B. O. Cata-Preta contributed to the data analysis and writing and review of the article, and approved the final version of the manuscript. C. Giugliani contributed to the study conception, data analysis, and writing and review of the article, and approved the final version of the manuscript.

## Additional information

ORCID: Beatriz Raffi Lerm (0000-0001-8154-8390); Yanick Silva (0000-0002-1356-3983); Bianca O. Cata-Preta (0000-0002-5632-7016); Camila Giugliani (0000-0002-2652-5214).

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## Resumo

A imunização é uma das principais intervenções responsáveis pelo declínio da mortalidade de crianças menores de cinco anos. Este estudo teve como objetivo explorar as tendências da cobertura vacinal total e as desigualdades relacionadas a riqueza, área de residência, regiões subnacionais e educação materna na Guiné-Bissau. Foram analisados dados do Inquérito de Indicadores Múltiplos (MICS) da Guiné-Bissau de 2006, 2014 e 2018. O índice absoluto de desigualdade (SII) foi calculado por meio de regressão logística para quintis de riqueza e escolaridade materna como medida de desigualdade absoluta. Um modelo de regressão linear foi ajustado com mínimos quadrados ponderados pela variância para estimar a variação anual dos indicadores de imunização em nível nacional e para os extremos de riqueza, educação materna e áreas urbano-rurais. Houve um aumento de 1,8p.p./ano (IC95%: 1,3; 2,3) na cobertura vacinal total ao longo do período estudado. Crianças mais pobres e nascidas de mães sem educação formal foram os grupos mais desfavorecidos. Ao longo dos anos, a desigualdade de riqueza diminuiu e as discrepâncias urbano-rurais foram praticamente extintas. Em contrapartida, não houve mudança no padrão de desigualdade de acordo com a escolaridade materna, prevalecendo a maior cobertura entre crianças nascidas de mulheres mais escolarizadas. Este estudo mostra a persistente baixa cobertura vacinal e as desigualdades relacionadas na Guiné-Bissau, principalmente considerando a educação materna. Estes resultados reforçam a necessidade de adotar a equidade como princípio fundamental no desenvolvimento de políticas de saúde pública para reduzir adequadamente as lacunas na imunização e não deixar ninguém para trás na Guiné-Bissau e além.

Saúde da Criança; Disparidades em Assistência à Saúde; Imunização; Vacinas

## Resumen

La inmunización es una de las principales intervenciones responsables de la disminución de la mortalidad de niños menores de cinco años. Este estudio tuvo como objetivo explorar las tendencias en la cobertura total de inmunización y las desigualdades relacionadas con la riqueza, el área de domicilio, las regiones subnacionales y la educación materna en Guinea-Bissau. Se analizaron datos de la Encuesta de Indicadores Múltiples (MICS) de Guinea-Bissau de 2006, 2014 y 2018. El índice absoluto de desigualdad (SII) se calculó mediante regresión logística para quintiles de riqueza y educación materna como medida de desigualdad absoluta. Se ajustó un modelo de regresión lineal con mínimos cuadrados ponderados por varianza para estimar la variación anual de los indicadores de inmunización a nivel nacional y para los extremos de riqueza, educación materna y áreas urbano-rurales. Hubo un aumento de 1,8p.p./año (IC95%: 1,3; 2,3) en la cobertura total de inmunización durante el período de estudio. Los niños más pobres y los nacidos de madres sin educación formal componían los grupos más desfavorecidos. A lo largo de los años, hubo una reducción de la desigualdad de riqueza, y las discrepancias urbano-rurales casi desaparecieron. Por otro lado, no hubo cambio en el nivel de desigualdad según la educación materna, y prevaleció una mayor cobertura entre los hijos de mujeres con mayor nivel de educación. Este estudio muestra la persistente baja cobertura de vacunación y las desigualdades asociadas en Guinea-Bissau, principalmente con relación a la educación materna. Los resultados apuntan la necesidad de adoptar la equidad como un principio fundamental en el desarrollo de políticas de salud pública para reducir las brechas de inmunización y no dejar a nadie atrás ni adelante en Guinea-Bissau.

Salud Infantil; Disparidades en Atención de Salud; Inmunización; Vacunas

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