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Navigating the divide: inequalities in household experiences of healthcare disruption in Latin American and the Caribbean countries amidst COVID-19

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Abstract

Background Latin America and the Caribbean (LAC) is among the most unequal regions in the world in terms of wealth and household income. Such inequalities have been shown to influence different outcomes during the COVID-19 pandemic, including the disruption of routine health services. The aim of this paper is to examine socioeconomic inequalities in household experiences of healthcare disruption in LAC countries from mid-2020 to late 2021.

Methods We used household-level data from the COVID-19 High Frequency Phone Surveys (HFPS), conducted in 14 LAC countries in one round in 2020 and 24 countries in two rounds in 2021. Ordinary least square and Logit multivariate regressions were conducted to examine the correlation between reported healthcare disruptions with household characteristics for 2020 and 2021. Since household income levels were not directly collected in the HPFS, we created an index of inequality and estimated the relative index of inequality.

Results When analyzing 2020–2021 together, reported healthcare disruptions were lower if the respondent was employed or did not report lack of food in the last month; if the household had more people aged 65 or older or more rooms to sleep in. When analyzed separately in 2020 and 2021, having more people aged 65 or older or not experiencing food insecurity remained stable factors for lower odds of disruption in both years. In addition, being employed was associated with lower odds of disruption in 2020, while being male or having more rooms to sleep in were associated with lower odds of disruption in 2021. Regarding wealth differences in 2021 (it was not possible to compute it for 2020), households with the lowest wealth were 27.3% more likely to report a care disruption than households with the highest wealth.

Conclusions The socioeconomic status of households in LAC was a relevant factor in explaining the disruption of healthcare during the COVID19 pandemic, with a clear social gradient where the wealthier a household, the less likely it was to experience disruption of care. Food security, employment, and gender policies should be integral to

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preparing for and responding to future shocks such as pandemics. Prioritizing the most affected populations, like the elderly during COVID-19, can enhance the health system effectiveness.

Keywords Healthcare disruption, Inequality, COVID19, Latin America, Caribbean

Background

The Latin America and Caribbean (LAC) region has the highest wealth concentration inequality globally and ranks second in household income inequality [1]. This contributes to creating a context where living conditions are substantially worse for the most vulnerable groups, predisposing the population to significant health inequalities [2]. On this basis, the Coronavirus Disease 2019 (COVID-19) pandemic and associated responses impacted virtually all areas of societies, with existing inequalities influencing outcomes for different population groups in LAC and elsewhere. For instance, globally, COVID-19 mortality rates were higher in socioeconomically disadvantaged areas of compared to affluent ones [3]. In LAC, social gradients in COVID-19 mortality have been documented in several countries, such as Argentina [4], Brazil [5], Chile [6], and Colombia [7].

Another relevant issue relates to the impact of the COVID-19 pandemic on the provision of routine healthcare, as many health systems faced major disruptions in various health services [8–12]. From an individual's perspective, a disruption of healthcare services occurs when an individual does not obtain care despite perceiving a need for it, representing the gap between perceived need and actual utilization of services [13]. Such disruptions have been found in LAC [14] and are predicted to worsen health outcomes, particularly affecting mental health, noncommunicable diseases, communicable diseases (e.g. tuberculosis, malaria, HIV), and maternal and child health services, including sexual and reproductive health [15].

A key public health issue linked to the disruption of care is inequalities. As described by Frey et al. [16], several factors contribute to group differences in the decline of non-COVID-19 healthcare services: the pandemic likely changed the underlying need for certain medical services among different groups; people avoided visiting healthcare centers, with avoidance patterns varying among groups; and sociodemographic groups may differ in their ability to successfully navigate a pressured healthcare system (e.g. financial barriers, literacy). Studies in countries like Japan [17], The Netherlands [16], South Africa [18], the UK [19], and the United States [20], have shown that the lowest socioeconomic groups experienced higher levels of healthcare disruption. However, such inequalities during the COVID-19 pandemic have been less explored in LAC, leaving a significant knowledge gap. In particular, the first and second years of the pandemic were different in LAC. The first was a year of government-mandated restrictions, health systems overwhelmed and uneven testing capacity, and a severe economic downturn. The second year saw the start of vaccination campaigns, but with unequal access across countries, a partial loosening of restrictions, the emergence of new variants that generated further COVID-19 waves, a gradual economic recovery in some areas, and a continued strain on health systems.

In this scenario, understanding how healthcare disruption differed between socioeconomic groups and identifying the factors that influenced these disparities is crucial. This line of research can inform policy efforts to mitigate the long-term effects of disrupted care and enhance preparedness for future public health emergencies.

The aim of this paper is to examine socioeconomic inequalities in household experiences of healthcare disruption in LAC countries from mid-2020 to late-2021. Specifically, the paper addresses the following research questions in the context of the COVID-19 pandemic in the region:

- What household characteristics are associated with self-reported disruption of healthcare services in 2020–2021, and are there differences between the two years?
- What is the association between self-reported disruption of healthcare services and household wealth in 2021? Is there a social gradient between households with the lowest and highest wealth?

Methods

Data and study population

This cross-sectional study used household survey data from the LAC COVID-19 High-Frequency Phone Survey (HFPS) supported by the World Bank in 2020 and UNDP in 2021. The HFPS was conducted in 14 countries in 2020 and expanded to 24 countries in 2021. Telephone coverage, measured as mobile phone subscriptions, was 109% on average in LAC in 2022, with the highest in Antigua and Barbuda (197%) and the lowest in Belize (66%). Therefore, telephone penetration can be considered as very high [21]. For this study, we included the countries with surveys that include sufficient control variables. The included countries are: Antigua & Barbuda, Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico,

Nicaragua, Paraguay, Peru, Saint Lucia, and Uruguay [22].

Survey samples were drawn using a dual frame of cellphone and landline numbers generated through Random Digit Dialing (RDD), ensuring representation at the national level of households with landlines those where at least one member has a cellphone [23]. The survey was conducted in multiple rounds: the first from May 8 to June 14, 2020; the second from June 5 to July 16, 2020; the third from July 5 to August 25, 2020; the fourth from May to July 2021; and the fifth from October to early December 2021. Eligible respondents were adults aged 18 years and older, with only one respondent per household providing answers on behalf of all household members. In the first three rounds in 2020, the same respondent was interviewed and reached a response rate of 26% in the first round, while recontact rates per round can be found on reference [23]. In 2021, the fourth round revisited the same households in 12 countries to maintain a panel dataset, achieving an average household response rate of about 30%. Additional households were included through a refresher sample also using a dual frame RDD to ensure representativeness in each country, while two countries used entirely new households for their samples. The fifth round (second round of 2021) comprised a complete refresher sample.

While some countries have up to three waves of data available for 2020, we only use the first wave in our analysis for two primary reasons. Firstly, the time interval between the 2020 waves is shorter (May to August), compared to the intervals between the 2021 waves (May-July and October-December). Secondly, the second and third waves of 2020 lack many essential control variables in several countries that are relevant to the regression analysis, such as sex, age, number of adults aged 65 or older, income loss, household size, number of cell phones, and education.

Household wealth measures

Since direct household income levels were not collected in HPFS, we created two proxies for wealth. First, we follow steps similar to those developed by the Demographic and Health Surveys to generate a wealth index using factor analysis and six household assets [24]: number of sleeping rooms, Wi-Fi access, washing machine, motorcycle, number of smart cells, and computer. Second, we use the wealth index to create a relative index of inequality [25, 26], which we call relative wealth index (RWI) due to the use of wealth instead of income of households. Both wealth measures were only computed for the two survey rounds of 2021 because of the availability of variables. See the Additional File we provide the Stata codes to generate the wealth index and the RWI.

Health care disruption variable and covariates

For the health care disruption variable, the respondent in each household was asked about the need for care during a specific period of the pandemic and then asked if they couldn't get it. If the latter answer was "yes", we classified the household as having experienced disrupted care.

For model estimation across all three survey rounds, we selected the following covariates based on their use in previous literature and data availability: urban or rural residence [27], gender of the respondent [28], age of the respondent [29], educational level of the respondent [30], employment status in the last month [31], income loss compared to the past month [32], lack of food in the past month [33], household size [34], number of members aged 65 years or older [35], number of sleeping rooms in the household [36], and access to Wi-Fi internet [37]. In the regression analyses on the 2021 survey rounds, additional covariates were included: number of children [34], number of smartphones [37], ownership of a washing machine [38], and ownership of a motorcycle [39].

Analytical approach

We conducted descriptive analyses to present household characteristics by country and per survey round.

First, we used ordinary least squares (OLS) and Logit regressions to assess correlations between self-reported disruption of healthcare services and available variables for all three rounds (2020 and 2021) and then for the two survey rounds of 2021 (i.e., rounds four and five only) at the regional level and for countries with at least five hundred household observations in the 2021 rounds. We separated out the rounds from 2021 due to changes in the sample and availability of covariates. Second, we used OLS and Logit regressions to test the association between reported healthcare services disruption and household estimated wealth after controlling for the selected control variables at the regional level and by country. Third, we attempted to quantify the difference in disrupted healthcare between those households with the lowest and highest estimated wealth within each country using an index of relative inequality, specifically the Relative Wealth Index (RWI) [25]. Due to small sample sizes in each country (below 500 observations per survey round when including control variables), we were only able to estimate the RWI for the full sample of countries and unable to quantify the difference in disrupted healthcare within or across countries. The RWI measures the relative difference in disrupted healthcare across lower and higher wealth groups, with a negative coefficient indicating lower wealth groups experience higher disrupted care. All regressions use robust standard errors. The variance inflation factor (VIF) test was applied to assess multicollinearity and determine the final models to

be used. We dropped the variables exceeding a correlation of 30% (see Additional file).

Data management and statistical analyses were conducted using R (version 4.1.1) and Stata software version 15.1.

Results

Table 1 presents a summary of household characteristics by country. Most households interviewed were from urban areas (68.7%), with women respondents accounting for 53.8% of the interviews. The mean age of respondents was 40 years old, with a mean of 0.36 members aged 65 years old or older and 1.2 children per household. See the Additional file for more information on further variables per country and per survey round.

Household level composition and self-reported disrupted healthcare

Table 2 presents the OLS regression results for the three survey rounds in 2020 and 2021, after applying the VIF multicollinearity test and considering a significance level of $p<0.05$. The results indicate that reported disruptions to healthcare were less prevalent when the respondent was employed and did not report lack of food in the prior month, and when the household had more members aged 65 or older or more sleeping rooms. For instance, each additional person aged 65 or older decreased the probability of healthcare disruption by 1.1% points, holding other factors constant. Additionally, being male, having a smaller household size, and owning a higher number of cellphones were associated with lower levels of healthcare disruption at the $p<0.10$ significance level.

In our analysis of the 2020 survey round and the two 2021 survey rounds separately, certain factors consistently showed significance in reducing the probability of healthcare disruption. Specifically, having more people aged 65 or older and reporting no lack of food in the prior month were consistently associated with lower levels of disrupted care in both years. However, being male and having a greater number of rooms were significant only in 2021, indicating less disruption. Conversely, being employed was significant only in 2020, correlating with reduced disruption (Table 2). Furthermore, the results from the Logit regression models exhibited similar coefficient directions and levels of significance, underscoring the robustness of the findings (see Additional file).

Table 1 Description of household (hh) characteristics by country for all 3 rounds, 2020 and 2021

Country	Number of observations	Percentage of urban HH	Percentage of male respondents	Mean age of the respondent	Mean number of HH members aged 65 or older	Mean number of children in the HH
Antigua & Barbuda	790	46.6%	45.2%	40.77	0.27	0.94
Argentina	3538	89.5%	43.1%	46.87	0.38	0.90
Belize	1714	45.9%	44.6%	35.89	0.21	1.49
Bolivia	3659	78.7%	52.4%	36.59	0.34	1.41
Brazil	2166	89.6%	44.9%	42.28	0.31	0.91
Chile	3541	82.7%	43.1%	42.85	0.38	0.78
Colombia	3909	78.4%	40.6%	40.60	0.42	1.17
Costa Rica	2511	51.4%	44.7%	41.89	0.34	0.89
Dominica	1740	40.5%	45.9%	41.51	0.34	0.95
Dominican Republic	2569	67.1%	45.5%	39.96	0.34	1.29
Ecuador	3470	73.6%	45.0%	39.41	0.32	1.40
El Salvador	2434	50.8%	49.8%	39.78	0.44	1.14
Guatemala	3534	53.3%	49.5%	36.45	0.41	1.41
Guyana	1660	36.7%	40.7%	37.91	0.28	1.34
Haiti	5175	70.6%	58.6%	32.25	0.28	1.60
Honduras	2832	52.2%	43.0%	36.06	0.35	1.59
Jamaica	1700	48.1%	46.8%	39.48	0.33	1.19
Mexico	7245	79.4%	43.2%	44.32	0.43	0.96
Nicaragua	1698	66.2%	50.0%	36.40	0.40	1.47
Panama	2150	68.1%	45.2%	39.62	0.32	1.21
Paraguay	2852	81.1%	45.4%	37.84	0.34	1.20
Peru	3936	74.4%	46.1%	38.25	0.44	1.34
Saint Lucia	1695	41.2%	44.8%	41.06	0.28	0.89
Uruguay	1746	89.2%	42.9%	43.35	0.29	0.83
24 countries	68,264	68.7%	46.2%	39.68	0.36	1.20

Table 2 Ordinary least squares regression analysis of self-reported healthcare disruption and household (hh) characteristics in LAC countries, 2020 and 2021 survey rounds

	2020–2021, three survey rounds	2020, one survey round	2021, two survey rounds
Urban HH	0.00037 (0.01003)	-0.02664 (0.02383)	0.01156 (0.00734)
Male respondent	-0.01539* (0.00788)	-0.02622 (0.01927)	-0.01453*** (0.00484)
Age of the respondent	0.00035 (0.00021)	0.00041 (0.00043)	0.00028 (0.00028)
Income loss during the pandemic	0.00856 (0.00637)	0.03394 (0.02199)	-0.00382 (0.00438)
More than primary education of the respondent	-0.00572 (0.01279)	-0.01639 (0.04173)	0.00151 (0.00706)
Employed respondent	-0.01959*** (0.00684)	-0.04250*** (0.01231)	-0.00141 (0.00384)
HH size	0.00505* (0.00290)	0.00340 (0.00481)	0.00505 (0.00429)
Number of people aged 65 or older in the HH	-0.01094** (0.00400)	-0.02284** (0.00929)	-0.00601** (0.00263)
Number of cell-phones in the HH	-0.01220* (0.00605)	-0.01356 (0.00947)	-0.00364 (0.00434)
Lack of food prior month	0.04288*** (0.01350)	0.10435** (0.04198)	0.01755*** (0.00567)
Number of sleeping rooms	-0.00585** (0.00277)	0.00244 (0.00749)	-0.01096*** (0.00312)
Wi-Fi connection	-0.00874 (0.01797)	-0.01152 (0.04260)	-0.00546 (0.00940)
_cons	0.09552*** (0.02185)	0.23641*** (0.04013)	0.03321 (0.02028)
N	15,437	2834	12,603
R-sq	0.127	0.108	0.035

Standard errors in parentheses

="* p<0.10; ** p<0.05; *** p<0.010"

Household estimated wealth, relative wealth index, and self-reported disruption of healthcare services

The distribution of self-reported disrupted healthcare services among households across wealth quartiles for the two survey rounds of 2021 is shown in Fig. 1. It shows that the households with the highest wealth index experienced the lowest disruption of care, whereas those with the lowest wealth index reported the highest disruption.

Using the estimated wealth index, we present the Logit regression results for their straightforward interpretation of coefficients related to the RWI. The OLS results are available in the Additional file, along with the wealth index and RWI per country and survey round. The Logit regression indicates that being male, having more people aged 65 or older, and reporting no lack of food in the prior month are associated with fewer reports of disrupted care. In addition, the wealth index shows that higher estimated household wealth correlated with lower odds of reporting disrupted care.

Table 3 presents a Logit regression, including the RWI, showing that the relative risk of disrupted care was higher in lower wealth households compared to higher wealth households in 2021. The RWI quantifies the percentage variation in the reports of disrupted care between the lowest and highest estimated wealth groups (calculated as $[RWI - 1] \times 100$) [40, 41]. In this case, the RWI shows that households in the lowest wealth groups had 27.3% higher odds of reporting disrupted care compared to those in the highest wealth groups.

Discussion

Summary and interpretation of key findings

In our analysis, we found that households with more people aged 65 or older, more rooms to sleep in, where the respondent was employed, and that did not experience food insecurity in the prior month were less likely to experience disruptions in care. When analyzed separately for 2020 and 2021, having more people aged 65 or older and not experiencing food insecurity remained stable factors associated with lower odds of disruption in both years. Additionally, in 2020, being employed was associated with less disruption, while in 2021, being male and having more rooms to sleep in were associated with less disruption.

In terms of wealth differences in 2021, wealthier households, were less likely to experience disrupted care, showing a clear social gradient of inequality. Specifically, our analysis shows that households with the lowest wealth were 27.3% more likely to report a disruption in care compared to households with the highest wealth.

Lack of food in the previous month appears to be a strong predictor of disrupted care during the first two years of the pandemic in LAC. Although there might be a correlation between lack of food and wealth, this finding highlights the importance of addressing food security during emergencies, as it is closely linked to inequalities, including on health care disruption. Furthermore, low-income households have been found to experience higher levels of food insecurity [42, 43].

The finding that having more people aged 65 or older in the household is associated with less disruption can be understood by the fact that the elderly were more affected by COVID-19 and therefore demanded more services [44]. This, coupled with health systems' prioritization of the elderly for COVID-19 care [45], can explain the reports of less disrupted care.

During 2020, being employed was correlated with less disruption, but this was not the case in 2021. The social and economic impact was much harder in the first phase of the pandemic: the economic contraction in LAC reached −6.6% and unemployment was 10.2% in 2020. In

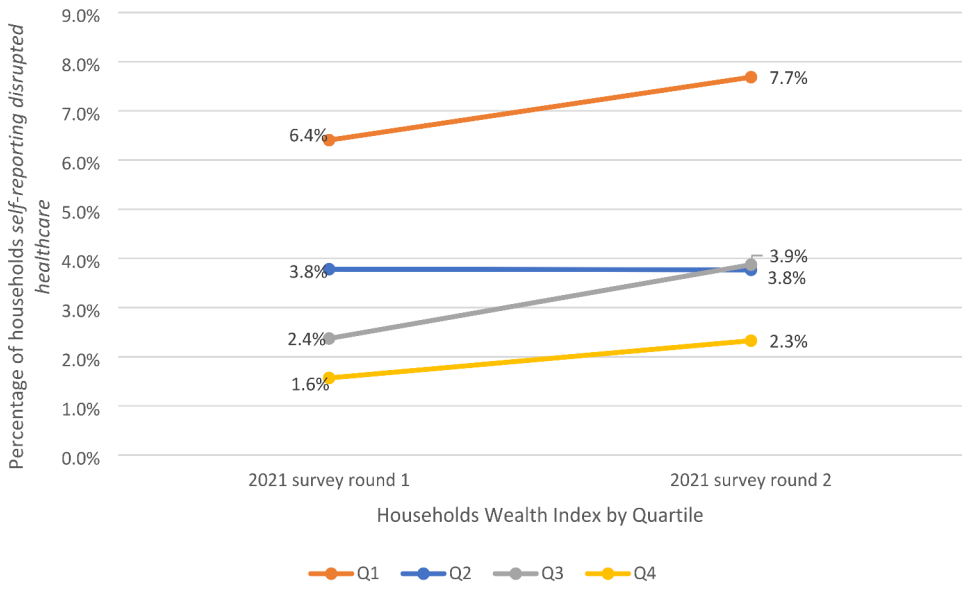

Fig. 1 Share of households self-reporting disrupted healthcare by wealth quartile in 24 Latin America and the Caribbean countries, based on two survey rounds conducted in 2021. Q4 highest wealth index; Q1 lowest wealth index

Table 3 Logit regression analysis of self-reported healthcare disruption, household (hh) wealth index, and relative index of inequality in 24 LAC countries, based on two survey rounds conducted in 2021

	2021, two survey rounds	
Urban HH	0.05607 (0.26087)	-0.02283 (0.25409)
Male respondent	-0.31437*** (0.11084)	-0.32553*** (0.10912)
Age of the respondent	0.00144 (0.00541)	0.00093 (0.00510)
Income loss during the pandemic	-0.09202 (0.07859)	-0.07498 (0.08220)
More than primary education of the respondent	0.27706 (0.26308)	0.19081 (0.27283)
Employed respondent	-0.22731 (0.21787)	-0.26358 (0.20798)
Number of people aged 65 or older in the HH	-0.25455** (0.11287)	-0.27574*** (0.09949)
Lack of food prior month	0.25636** (0.10060)	0.39350*** (0.12690)
Number of children in the HH	0.08947 (0.06375)	0.09097 (0.06581)
Wealth index	-0.62670** (0.25697)	
Relative Wealth Index		-0.72744** (0.30594)
Constant	-2.94603*** (0.31226)	-2.71236*** (0.39042)
N	13,408	13,408

Standard errors in parentheses

="* p<0.10; ** p<0.05; *** p<0.010"

contrast, 2021 saw economic growth of 7% and a drop in unemployment to 9.2% [46]. This meant that people who remained employed in 2020 might have also had better access to healthcare, possibly because of having more financial resources during that harsher period.

During 2021, being male was correlated with less self-reported disruption. The perception is influenced by women's caretaking and cultural roles. In LAC, women experienced a greater contraction in employment and in economic participation than men [47], as well as a higher prevalence of mood symptoms, for instance, related to depression [48]. Based on these observations, during the second year of the pandemic, men were in better circumstances to return to work than women, and they also had more access to care when needed as they were already going out of their homes.

Limitations and implications for research

Several relevant limitations can be noted in our study. First, there was no direct measure of household socioeconomic level in the original HFPS, so we had to create an index for it. Second, small sample sizes per country precluded analyzing the RWI in each country. Third, missing data in rounds 2 and 3 of the survey impeded use of these parts of the databases. Fourth, the lack of pre-pandemic information limited our ability to make better comparisons, and we could not control for access to health services before the pandemic, which might be a confounding variable. Fifth, telephone surveys might have coverage and representativeness issues, and there was a loss of panel households between 2020 and 2021, which was replaced as best as way possible. Sixth, the study excluded large countries such as Brazil in 2020 and

Venezuela in both years, which are among the most populated countries in the region. Seventh, one respondent reported information for the entire household, which might have introduced some inaccuracies, including about comparability across countries.

Implications for policy and practice

The COVID-19 pandemic had a disproportionate impact on less well-off households, which should be considered in all policies aimed at preparing for and responding to future pandemics and other shocks. In particular, social protection systems can provide support to ensure food security for low-income households; labor market policies can be developed to secure employment or basic earnings for low-income workers; and gender policies can be implemented to address the specific needs of women. Depending on the stage of an emergency, the relevant factors may vary. For example, policies to support employment may be crucial during the most acute phases of an emergency, but gender policies may become more pertinent as a country emerges from the most critical phases.

On the health system side, prioritizing the most vulnerable populations (such as the elderly during COVID-19) can be an effective strategy to ensure that care is provided when needed. The challenge lies in striking a balance between prioritizing defined groups and maintaining essential health services for all, without discrimination.

Socioeconomic inequalities should be integrated to the resilience cycle of health and social systems. This begins with prevention and preparedness, where disadvantaged groups should be identified, and emergency plans formulated with their specific needs in mind. In future emergencies, health systems recognize that lower socioeconomic groups face barriers in accessing healthcare, necessitating targeted interventions to ensure their access. Primary health care plays a pivotal role in this response, being closer to communities and territories. Furthermore, adaptation and learning systems should incorporate inequalities by developing and using information systems that allow disaggregation to identify and support the most vulnerable populations.

Conclusions

The socioeconomic status of households in LAC was a relevant factor in explaining the disruption of healthcare during the COVID19 pandemic, with a clear social gradient where wealthier households were less likely to experience care disruptions. This paper has identified key areas for preparedness and response policies aimed at mitigating the impact on health service utilization during future pandemics and shocks. These areas include addressing food security, employment, and gender considerations, while prioritizing the most affected populations, such as the elderly during COVID-19, as a crucial health system strategy.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12939-024-02337-7.

Supplementary Material 1

Author contributions

CAH led the conception and design of the work, with contributions from ACK, JMD, PB, DK and NK. ACK led the acquisition and data analysis, with contributions from CAH and JMD. CAH, ACK, JMD, PB, DK and NK contributed to the interpretation of data analysis. CAH led the manuscript drafting and ACK, JMD, PB, DK and NK revised it and approved the submitted version.

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Data availability

All data used in this analysis are available in the World Bank Microdata Library in the High Frequency Phone Surveys collection: https://microdata.worldbank.org/index.php/catalog/hfps/?page=1&ps=15&repo=hfps.

Declarations

Human ethics and consent to participate declarations

As secondary data analysis, this study did not constitute human subjects research and ethical approval was not required.

Competing interests

The authors declare no competing interests.

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