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Belief in COVID-19 Misinformation in Nigeria

Josh A. Goldstein, Shelby Grossman, and Meredith Startz*

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Abstract

Research suggests that partisanship and social media usage correlate with belief in COVID-19 misinformation, and that misinformation shapes citizens' willingness to get vaccinated. However, this evidence comes overwhelmingly from frequent internet users in rich, Western countries. We run a panel survey early in the pandemic leveraging a pre-pandemic sample of urban middle-class Nigerians, many of whom do not use the internet. Analysis registered under our pre-analysis plan shows that opposition party support and social media usage are correlated with belief in anti-government misinformation, but not other types of COVID-19 misinformation. Surprisingly, we find no relationship between overall belief in misinformation and willingness to be vaccinated several weeks later. Partisanship and ethnicity are predictive of vaccine hesitancy, while men are both more likely to believe misinformation and more willing to be vaccinated. These findings have significant implications for understanding vaccine hesitancy in Nigeria and beyond.

Keywords: misinformation, COVID-19, social media, Nigeria

*josh.goldstein@georgetown.edu; shelbygrossman@stanford.edu; meredith.l.startz@dartmouth.edu. Pre-analysis plan: `https://osf.io/6yw7q`. Supplementary material for this article is available in the appendix in the online edition. Replication files are available in the JOP Dataverse (https://dataverse.harvard.edu/dataverse/jop). The empirical analysis has been successfully replicated by the JOP replication analyst. Our survey received ethics approval from Stanford University under IRB #55645. We are appreciative of the funders of this survey, including the International Growth Centre and the Centre for Economic Policy Research's Private Enterprise Development in Low-Income Countries initiative.

1 Introduction

Disease-related misinformation was rampant early in the COVID-19 pandemic. To craft effective public health interventions, it is important to know who is misinformed, and why. Research suggests that partisanship (Calvillo et al., 2020) and social media usage (Bridgman et al., 2020) are correlated with belief in COVID-19 misinformation, and that misinformation shapes citizens' willingness to get vaccinated (Loomba et al., 2021) . However, this evidence comes overwhelmingly from frequent internet users in rich, Western countries. We find that these patterns do not hold among a sample of urban Nigerians, suggesting that adapting strategies to local circumstances is an important aspect of public health messaging to combat misinformation.

We investigate belief in COVID-19 misinformation early in the pandemic among wholesale and retail traders in Lagos, Nigeria. We leverage an existing survey panel, sampled from an original census of shops, which we have followed since 2015. While many studies of COVID-19 misinformation rely on online surveys of respondents, our pre-pandemic sample allows us to capture a broader range of respondents, including 21% who do not use a smartphone.

We find that the relationships between partisanship, media consumption, belief in misinformation, and vaccine hesitancy in the U.S. do not seem to generalize to this Nigerian context. Individuals whose main source of information about COVID-19 was social media are not more likely to believe in misinformation. We expected supporters of the main opposition party to be more likely to believe misinformation, as they may be more skeptical of public health messaging from the ruling party. In fact, they are more likely to believe certain types of misinformation that could be perceived as anti-government, but not other types. Most surprisingly, belief in COVID-19-related misinformation is not associated with lower willingness to get vaccinated.[1]

[1]We do not ask about vaccine misinformation specifically, but about popular COVID-19 misperceptions at multiple stages of the pandemic. As a result, our null finding does not

There is no clear "type" of person who is both inclined to believe misinformation and is vaccine hesitant. Some groups most likely to believe misinformation–e.g. men–are also more willing to be vaccinated. However, partisan and demographic factors are predictive of vaccine hesitancy. Supporters of the main opposition party and members of the politically-alienated Igbo ethnic group are far more likely to be vaccine hesitant. Our findings suggest that factors beyond misinformation may be more significant predictors of vaccine hesitancy in developing countries.

2 Politics and COVID-19 in Nigeria

We investigate belief in COVID-19 misinformation in Lagos, Nigeria. Sub-Saharan Africa's first confirmed case of COVID-19 was in Lagos in February 2020. The government took steps to curb the spread of the virus, including banning mass gatherings and international flights, closing schools, and issuing lockdown orders for several states, including Lagos (Dixit, Ogundeji and Onwujekwe, 2020).

Nigeria has a federal system of government, and its politics are divided along partisan and ethnic lines. From 1999 to 2015 the federal government was controlled by the Peoples Democratic Party (PDP). Since 2015 the All Progressives Congress (APC) has been in power. While they have run candidates from several ethnic groups in presidential elections, neither party has run an Igbo candidate, the country's third largest ethnic group (Afrobarometer Data, 2021). Igbos have historically felt alienated from the federal government; some advocate that their ancestral southeast region secede from Nigeria, which was the focus of a bloody civil war in the late 1960s. The APC (and its precursors) and people of Yoruba ethnicity have been dominant in Lagos State for decades.

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suggest that belief in vaccine misinformation does not predict vaccine hesitancy, but rather that belief in other forms of misinformation earlier in the pandemic is not correlated with vaccine hesitancy. Our findings contrast with two studies with online samples from Mexico, the U.S., and the U.K. (Roozenbeek et al., 2020; Romer and Jamieson, 2020).

3 Partisanship, Social Media, and Beliefs About COVID-19

Belief in COVID-19 misinformation show partisan differences in the U.S. (Hamel et al., 2021). These may be due to pre-existing beliefs and ideology, or to elite cue-taking (Grossman et al., 2020). If elites spread misinformation, partisans may adopt those views because they use elites as informational shortcuts or because of partisan motivated reasoning (Gilens and Murakawa, 2002).

In Nigeria, official statements about COVID-19 from the federal government have been generally accurate, and partisanship is salient, leading to our first hypothesis:[2]

H1: Supporters of the main opposition party will be more likely to believe COVID-19 misinformation compared to ruling party supporters, conditional on gender, age, education, and ethnicity.

Early in the pandemic, there was concern about COVID-19 misinformation on social media. Studies have shown a positive association between getting information about COVID-19 on social media and belief in misinformation (Bridgman et al., 2020).

H2: People who primarily rely on social media for information about COVID-19 will be more likely to believe misinformation, conditional on gender, age, education, and ethnicity.

Understanding the factors that contribute to willingness to get vaccinated is critical for stopping the spread of COVID-19 as well as other diseases. Several studies have shown that belief in misinformation is negatively associated with willingness to get vaccinated (Romer and Jamieson, 2020; Roozenbeek et al., 2020). We expect this to hold in Nigeria.

[2]The preregistration can be found here: https://osf.io/6yw7q. The hypothesis that belief in misinformation would be negatively correlated with vaccine willingness (H3) was not pre-registered, because at the time, a vaccine had not yet been developed.

H3: Belief in COVID-19 misinformation will be negatively associated with vaccine willingness.

4 Data and Methods

Early studies of COVID-19 misinformation struggled to obtain sample frames when in-person sampling was unsafe. Our study benefits from an existing sample of wholesale and retail traders in Lagos that was constructed in 2015 from a census of over 50,000 shops.

We conducted four waves of surveys by phone from April 2020 to February 2021. Completion rates ranged from 54% to 62%, out of a sample of 1,179 traders. We had already established relationships with the traders during earlier in person surveys, and we believe this allowed us to elicit more honest responses to potentially sensitive questions.

The first three surveys were deployed between April and June 2020—a stage in the pandemic when misinformation was rampant—and we asked about misinformation that was popular at different points in time. We identified misinformation commonly circulating in Nigeria just prior to each survey wave by consulting `dubawa.org`, a prominent African fact-checking organization, consulting with Nigerians, and searching COVID-19 related words on CrowdTangle, a social media analytics platform that allowed us to search posts created by people in Nigeria. We asked about the following six pieces of misinformation: Bill Gates created or spread COVID-19; What looks like COVID-19 is actually a 5G-caused sickness; Almajiris are being sent to eastern Nigeria to spread COVID-19 there[3]; COVID-19 was *intentionally* created in a lab; There is a cure for COVID-19; The president of Madagascar developed a cure for COVID-19.[4]

The fourth survey wave, which took place in February 2021, after multiple vaccines had been created, asked respondents: **?**If a vaccine to prevent COVID-19 was available to you

[3]Almajiris are people who leave home to study Islam, and eastern Nigeria is where the Igbo ethnic group predominates.

[4]President Andry Rajoelina claimed a medication called Covid-Organics could cure COVID-19.

today, would you get the vaccine?**?**

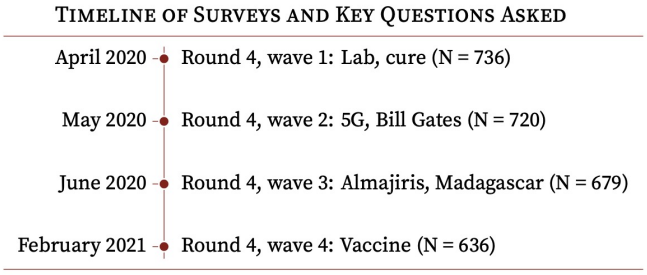

Figure 1: Timeline of Surveys and Key Questions Asked.

Requiring respondents to provide an answer about whether they believe something may lead to the overcounting of those who are misinformed, when people merely lack information. We included response options for **?**don't know,**?** **?**don't understand question,**?** and **?**refuse.**?** Enumerators also asked respondents about their confidence in each answer to misinformation questions. We also asked respondents about their primary method for getting information about how to protect themselves from the disease, and drilled down to the specific radio channel or Facebook group.

5 Results

5.1 Who Believes COVID-19 Misinformation?

Thirty-four percent of respondents who answered all of the misinformation questions believed no misinformation. Just 5% of respondents believed four or more pieces of misinformation. There are no consistent correlates of belief in misinformation.[5]

We expected opposition supporters to be more likely to believe misinformation. On average, they believe .29 more pieces of misinformation than ruling party supporters (out of six, see Appendix Table 5).[6] However, this pattern does not hold for all misinformation.

[5]All results in Section 5 use OLS regressions.

[6]The model controls for gender, education, ethnicity, age, and whether social media is the primary source of information about COVID-19. See Appendix Section A.7 on the role of

We grouped the misinformation narratives into those suggesting the government was acting nefariously and those suggesting there was a cure (note that this was not in our pre-analysis plan). The former category includes 1) Gates misinformation, as the federal government has a long-standing relationship with the Gates foundation related to the country's polio vaccination campaign, and empirically Gates misinformation has an anti-government slant in Nigeria, 2) 5G misinformation, as these narratives focused on government installing 5G to control people/make people sick, and 3) Almajiri misinformation, as this story pitted the federal government against the eastern part of the country. Cure misinformation includes believing there is a cure for COVID-19 and believing the president of Madagascar created a cure.[7]

Supporters of the main opposition party and Igbo respondents are more likely to believe anti-government misinformation (Figure 2). Appendix Table 4 uses normalized measures of belief as the outcomes, and shows that supporters of the main opposition party and Igbo respondents are 6-7% more likely to believe anti-government misinformation, but no more likely to believe cure misinformation.[8] In contrast, men were substantially more likely to believe both anti-government and cure misinformation (see Appendix Table 4).

Social media usage is correlated with some specific misinformation, but not with overall beliefs. Respondents who report getting information about how to protect themselves primarily from social media were more likely to believe that Gates played a nefarious role in the pandemic and that the coronavirus was created intentionally in a lab, compared to those who got information by television, radio, or newspaper. But, they were less likely to believe that the president of Madagascar had created a cure for the disease. No specific media source used by respondents was consistently associated with being more or less likely to believe

religion.

[7]We further justify these distinctions in Appendix Section A.8.

[8]Appendix Figures 5 and 6 show results with *don't know* responses coded as being between those who do and do not believe the misinformation, as opposed to omitted. The results largely hold.

misinformation overall.

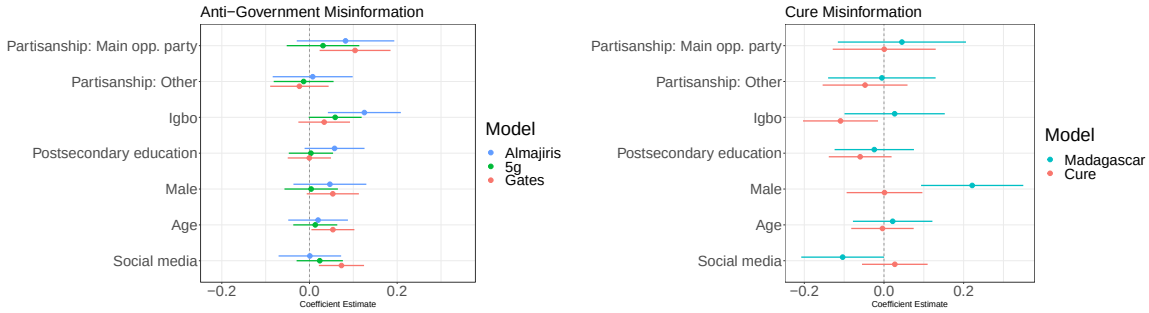

Figure 2: Correlates of belief in anti-government COVID-19 misinformation (left) and cure-related misinformation (right). Positive coefficients indicate more likely to believe misinformation. **?**Opposition party supporter**?** indicates PDP supporter. "Postsecondary education **?** indicates any postsecondary education. "Social media**?** indicates whether the respondent's primary reported source of information about COVID-19 is social media. To make any age-related patterns more visible, this and future models measure age as a binary above or below the median age of 44 variable. When including age as a continuous variable, all patterns hold, although the coefficient on Gates misinformation is no longer statistically significant. All outcomes are normalized to a 0 to 1 scale.

5.2 Who is Willing to be Vaccinated?

Forty-seven percent of respondents said they definitely or probably would get a vaccine for COVID-19 if it were available to them; the same percentage said they definitely or probably would not.[9] There was no statistically significant relationship between belief in any piece of misinformation and willingness to get the vaccine (see Appendix Section A.12).[10] This null result also holds when we group misinformation into anti-government misinformation and cure misinformation, and for misinformation overall, as well as both unconditionally and conditional on controls.

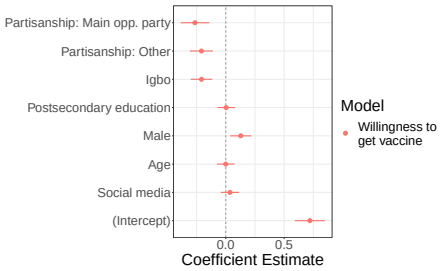

Figure 3: Correlates of willingness to be vaccinated, if a vaccine were available. Positive coefficients indicate more willing to get the vaccine.

[9]The remainder weren't sure, or refused to answer.

[10]We also found no relationship with *strong* belief in misinformation (see Appendix Table 7).

There were, however, significant partisan and demographic correlates of willingness to get the vaccine (see Appendix Table 8). Opposition supporters were 26% less likely to express willingness to get the vaccine, and Igbo respondents were 21% less likely. Men were about 13% more likely than women to express willingness.

6 Discussion

Our research, leveraging a unique, representative sample of traders in Lagos, holds several lessons for the fight against COVID-19. First, the relationships between partisanship, media consumption, and belief in misinformation documented in the U.S. do not neatly generalize to the Nigerian context. Partisanship does not map clearly to all COVID-19 misinformation, and social media users are no more likely to believe misinformation than non-social media users. Instead, it appears that groups that are inclined toward mistrust and skepticism of the current government are more likely to believe specific pieces of misinformation that frame the government as a bad actor.

We find no relationship between overall belief in misinformation and willingness to be vaccinated, and no "type" of person who is both inclined to believe misinformation and is vaccine hesitant. Instead, there are different correlates of different types of misinformation, and some demographic groups most inclined toward to misinformation are also most willing to be vaccinated. Igbo and opposition supporters were significantly more vaccine hesitant than Yoruba and ruling party supporters. Practically, this represents a public health challenge. Efforts to strengthen Nigeria's vaccine roll out could focus on public health messaging from sources that are credible to these populations.

Our findings suggest that factors beyond misinformation may turn out to be more significant predictors of vaccine hesitancy in some populations. Future research could assess the role of trust in medicine based on historical experiences (Obadare, 2005) and the accuracy of information from non-social media sources.

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8 Biographical Statements

Josh A. Goldstein is Research Fellow at Georgetown University's Center for Security and Emerging Technology (CSET), Washington D.C., 20001. Research occurred while Josh was at the Stanford Internet Observatory. Shelby Grossman is a Research Scholar at the Stanford Internet Observatory, Stanford, CA, 94305. Meredith Startz is an Assistant Professor of Economics at Dartmouth College, Hanover, NH 03755.