



EXAMINING DRIVERS OF COVID-19 VACCINE HESITANCY IN GHANA

**SUPPORTING THE GHANA
PANDEMIC RESPONSE**

Report written by

Dr Ken Brackstone, Clinical Informatics Research Unit (CIRU),
University of Southampton, UK

Full study team

Laud Boateng, Kirchuffs Atengble, Michael Head,
Herve Akinochi, Kingsley Osei, Kwabena Nuamah

July 2021



Suggested citation

Brackstone, K., Atengble, K., Head, M., Akinochi, H., Osei, K., Nuamah, K., Boateng, L. (2021). Examining drivers of COVID-19 vaccine hesitancy in Ghana. <https://doi.org/10.6084/m9.figshare.14494851>



CONTENTS

BACKGROUND Page 04

KEY FINDINGS Page 05

POLICY RECOMMENDATIONS Page 07

ANALYSES AND DISCUSSION Page 08

**REFERENCES, ETHICS,
ACKNOWLEDGEMENT** Page 10

BACKGROUND

ON 2 JULY 2021, THE GHANA HEALTH SERVICE URGENTLY ADVISED THE COVID-19 TASKFORCE THAT THE HIGHLY-CONTAGIOUS DELTA VARIANT OF THE SARS-COV-2 VIRUS HAD BEEN RECORDED WITHIN THE COMMUNITY DURING THE LATEST ROUND OF GENOMIC SEQUENCING. WITH COMMUNITY TRANSMISSION OF THIS HIGHLY DANGEROUS VARIANT, THERE IS GREATER URGENCY FOR AN EQUITABLE GLOBAL DISTRIBUTION OF COVID-19 VACCINES, AND ACHIEVING HIGH OVERALL VACCINATION RATES WITHIN GHANA IS NOW MORE CRUCIAL THAN EVER BEFORE. GOVERNMENT, HEALTHCARE, AND POLICY GROUPS IN GHANA WILL REQUIRE TIMELY DATA TO GUIDE THEIR IMMUNISATION STRATEGY AT THIS CRUCIAL TIME. IT IS FUNDAMENTAL THAT WE CONTINUE TO DEVELOP A DEEPER UNDERSTANDING ABOUT THE FACTORS THAT INFLUENCE PEOPLE'S WILLINGNESS TO BE VACCINATED. THIS DATA CAN INFORM HEALTH PROMOTION STRATEGIES THAT IMPROVE VACCINE CONFIDENCE AND COUNTER MISINFORMATION.

Significant obstacles stand in the way of ensuring global access to the vaccines – including vaccine hesitation. According to the World Health Organization (WHO), vaccine hesitancy is defined as the delay in the acceptance or blunt refusal of vaccines, which has been identified as a growing trend in global health and Africa (Marti, de Cola, MacDonald, Dumolard, & Ducios, 2017). Previously, many experiences and rumours have challenged the success and effectiveness of vaccination programs in African countries. For example, the polio vaccine boycott in Northern Nigeria in 2003-2004 was prompted by distrust and misconceptions of their religious leaders (Jegade, 2007). This is often driven, in part, by vaccine mis- and disinformation, which is an ongoing problem in West African countries – especially with the recent rise of social media users (Dotto & Cubbon, 2021).

This policy brief reports survey data collected in Ghana in June 2021, and is the third iteration from this study. The first survey was conducted in August 2020 prior to any COVID-19 vaccines being approved and available, and the second survey was conducted shortly after vaccines were delivered in Ghana in March 2021 (Brackstone, Atengble et al., 2021). We analyse a nationally representative cohort of

Ghanaian respondents (N = 1,295) in this current iteration. In our analyses, we operationalise vaccine hesitancy as respondents who reported disagreement or uncertainty to the statement: “When the COVID-19 vaccine becomes available to me, I will take it.” We hope that our findings provide further rich and interesting insights into the socioeconomic predictors associated with COVID-19 vaccine hesitancy in Ghana.

KEY FINDINGS

- **71.4%** of Ghanaian respondents agreed that they would be willing to be vaccinated against COVID-19 when offered the opportunity, **15.1%** were undecided, and **13.5%** disagreed. This gives us an overall hesitancy of **28.6%**. This is an increase in hesitancy of **11.4%** from the March survey (when we observed 17.2% hesitancy, comprising 9.7% who would not vaccinate and 7.5% undecided).
- **Among respondents who reported in this June survey that they were not willing to be vaccinated or were unsure**, the most common reasons included **not having enough information about the vaccine** (50.6%), believing the vaccine to be **dangerous** (32.1%; 22.2% lower compared to the previous survey in March), and **governmental mistrust** (21.4%). Other reasons included **fear of harmful side effects** (18.8%), **pharmaceutical mistrust** (14.9%), and believing that **COVID-19 is not severe enough** to warrant receiving the vaccine (13.7%).
- **38.9%** of respondents reported having seen or heard news stories about the Oxford AZ vaccine. From within this subgroup, **19.2%** reported that these stories were negative, **16.3%** reported that they were neither positive nor negative, and **64.5%** reported that they were positive. Similarly, **49.1%** reported having read stories about the Oxford AZ vaccine shared on social media. From this subgroup, **22.3%** reported that these stories were negative, **18.1%** reported that they were neither positive nor negative, and **59.6%** reported that they were positive.
- **31.6%** of respondents reported that they had recently seen or heard stories about the indecision surrounding the Oxford AZ vaccine rollout in Europe and North America, of which **62.0%** agreed that these stories made them feel worried about accepting the COVID-19 vaccine in the future.
- Replicating results from our previous survey, **religious beliefs** are the strongest predictor for hesitancy in our model. The odds of expressing vaccine hesitancy were 2.07 times higher for Christian respondents compared to Muslim respondents.
- New findings emerged to show that **education levels** may be a key predictor of vaccine hesitancy in Ghana. Our results showed that the odds of expressing vaccine hesitancy were 1.60 times higher for university-educated respondents (e.g., those who achieved undergraduate or postgraduate degrees) compared to lower-educated respondents (e.g., those who achieved higher secondary or lower). This may reflect more consistent access to the internet and different sources of information and misinformation among educated populations.
- Replicating results from our previous survey, **political alignment** is also a major predictor of vaccine hesitancy in Ghana. The odds of expressing vaccine hesitancy were 1.76 times higher for respondents who voted for the National Democratic Congress (NDC, the opposition party) compared to respondents who did not vote. Conversely, the odds of accepting the vaccine were 1.69 times higher for respondents who voted for the New Patriotic Party (NPP, the party in power) compared to respondents who did not vote.
- Replicating results from our previous survey, **gender** is also a predictor for hesitancy. The odds of expressing vaccine hesitancy were 1.60 times higher for females compared to males.
- Similar to previous findings, **community type** may be an additional barrier to achieving high vaccination rates in Ghana. The odds of expressing vaccine hesitancy was 1.42 times higher for respondents who lived in urban communities compared to respondents residing in rural communities.
- In terms of sources of COVID-19 news, the odds of accepting the vaccine was 1.43 times higher for respondents who reported retrieving their vaccine-related information from the **Ghana Health Service (GHS)** compared to respondents who did not report consulting the GHS.



POLICY RECOMMENDATIONS

These findings once again emphasise the need for multidimensional strategies to increase COVID-19 vaccination uptake in Ghana. Given the higher levels of vaccine hesitancy in Ghana compared to our previous survey (29%), and given that the lack of vaccine-related knowledge and information was the primary reason for respondents' reported hesitancy (51%), it will be especially critical to increase the amount of high-quality information about the safety and efficacy of the COVID-19 vaccine. Health promotion messages tailored towards women and men, people with specific religious (Christianity) or political (NDC or 'other') beliefs, people residing in urban communities, and people who are highly educated, will be especially crucial to achieving high vaccination rates in Ghana. While some measures will involve governmental strategies (e.g., district, regional, or national), others will require multi-stakeholder collaboration and solutions. The Ghana Health Service appears to be a trusted source, and thus education of GHS staff (including community healthcare workers in rural areas) can help to counter misinformation present in different demographics.

Short-term measures

- Promote measures nationally that increase the share of accurate and reliable medical and scientific information available about the pandemic and the safety and efficacy of vaccines. For example, information that is released by official sources, such as the Ghana Health Service, should be promoted on news websites and mass media channels, such as radio, newspapers, and TV, as well as by using Facebook ads, which guarantees wide reach and engagement.
- Develop targeted programs via multiple channels in Ghana, such as community outreach and media campaigns, in order to educate women, people with specific religious (e.g., religious leaders) or political beliefs, and people living in urban communities, with the goal to increase knowledge and trust in vaccines. Engage trusted local leaders in each of those regions to support the delivery of good public health messaging.
- Boost efforts via multiple channels, such as social media outlets, mass media outlets, and official government and health outlets to reach a broader range of people with clear information about vaccine safety. Official health and information articles should target specific groups of people nationally via channels such as Facebook ads and other media campaigns – especially on news websites and internet blog pages. Case studies using photos of real people and other trusted “voices) who are associated with the hesitant cohort (e.g., women, religious communities) may be effective in inducing confidence in the COVID-19 vaccines.
- Researchers should begin urgent exploration of the role that social media plays in disseminating good and bad vaccine-related information, including tailored health promotion campaigns aimed at diverse Ghanaian demographics, such as people with different levels of education.

Medium-term measures

- Facilitate initiatives among traditional media and online information providers to develop measures to assist consumers in discerning the quality of sources and of information content. For example, citizens could be taught to trust information that is released by “official” sources, such as the government or Ghana Health Service, rather than posts, blogs, and articles that are spread across news outlets and social media platforms.
- High quality resources should also be created and disseminated by all political parties – especially considering evidence of some level of distrust toward COVID-19 vaccines from some supporters of opposing parties (i.e., the NDC). Information could be tailored and targeted by district according to the voting in the recent general election.
- Promote information and scientific literacy. It would be beneficial for Ghanaian citizens to learn more about scientific methods, such as measures of risk and probability, and how scientific breakthroughs such as vaccines are created and tested. Furthermore, many respondents reported reservations about the vaccine being developed in Western countries such as the US and the UK. Thus, there could be approaches to show how international research can be adapted and adopted for local populations.

ANALYSES AND DISCUSSION

Data collection for this survey took place for 4 weeks from May 28 to June 30 2021. The 7-day rolling average for daily cases in Ghana was 36.29 at the start of data collection, which increased to 96.86 by the time we closed the survey. Respondents were 1773 Ghanaian citizens residing in all 16 regions of Ghana. There were 1552 respondents who started but did not complete the survey and are therefore not included here. From the 1773 respondents, 1295 (73.0%) reported that they had not yet received a single dose of the COVID-19 vaccine (78.3% male; Age Range = 18–76, Mage = 27.99, SD = 7.20). Margin of error (MOE) was 3%.

Among the largest ethnic groups were Akan (46.3%) and Ewe (16.4%), and the majority of respondents lived in Greater Accra (28.5%) and Ashanti (17.9%) regions. Further, 62.3% had completed higher education, and 33.7% had completed senior secondary, vocational training, or lower. More than 60% (62.0%) reported being single (vs. married; 20.8%), and 58.7% of respondents reported living in an urban community (vs. rural; 39.0%). Finally, 45.7% reported being unemployed (vs. 54.3% employed to some degree), while 78.8% reported being Christian (vs. 16.8% who were Muslim).

We asked respondents basic demographic questions, including how respondents obtained new information about the COVID-19 pandemic (i.e., sources and channels). Most crucially, we assessed their willingness to adopt the appropriate response to COVID-19 – that is, to receive the vaccine. To do this, we presented respondents with the basic statement: **“When the vaccine for COVID-19 becomes available to you, I will take it.”** Respondents agreed or disagreed on a 5-point Likert scale (1 = strongly disagree; 3 = undecided; 5 = strongly agree). Overall, 71.4% of Ghanaian respondents agreed that they would be willing to be vaccinated against COVID-19 when offered the opportunity, 15.1% were undecided, and 13.5% disagreed (28.6% overall hesitancy). These ratings differ to our most recent survey conducted in Ghana throughout March 2021, in which 82.8% reported that they were willing to be vaccinated (-11.4%), 7.5% were undecided (-7.6%), and 9.7% said they were not (+3.8%; 17.2% overall hesitancy). Thus, overall vaccine hesitancy has increased between the two time periods (+11.4%).

Respondents who expressed Christian beliefs were 2.07 times more likely to report vaccine hesitancy than respondents who reported being Muslim, replicating results from our previous survey in March. Thus, there is an urgent need for policymakers to develop targeted programs aimed at providing religious communities in Ghana with high quality information on the safety and efficacy of the COVID-19 vaccine.

We also found that vaccine hesitancy was 1.42 times higher for respondents who lived in urban communities compared to rural communities, replicating results from our previous survey. This also corroborates research by Samarasakera (2021), who recently surveyed

15,000 adults in fifteen African countries across five regions of the continent and found that respondents living in urban areas were more likely to take the COVID-19 vaccine compared with respondents living in rural settings.

Replicating results from Wave 2, political alignment is also a major predictor of vaccine hesitancy in Ghana. The odds of expressing vaccine hesitancy were 1.76 times higher for respondents who voted for the National Democratic Congress (NDC) compared to respondents who did not vote. Conversely, the odds of accepting the vaccine were 1.69 times higher for respondents who voted for the New Patriotic Party (NPP) compared to respondents who did not vote. These results might be mediated by trust in the current Ghanaian government. In fact, our analyses display significant differences between NDC and NPP voters in levels of trust and satisfaction in the government’s handling of the pandemic, which could explain these predictors. Policymakers will need to apply a multidimensional approach to increase vaccination uptake in this cohort, which should include positive public health messaging from politicians of all parties.

Once again, gender was a strong predictor of vaccine hesitancy in our model. Using multivariate analyses that controls for other socioeconomic and psychological factors, the odds of expressing vaccine hesitancy were 1.52 times higher for females than males. Based on raw percentages, 72.9% of male respondents answered that they would be willing to receive the vaccine, 13.2% were undecided, and 13.9% were unwilling (27.1% hesitancy). Among female respondents, 65.6% indicated a willingness to be vaccinated, 22.2% were undecided, and 12.2% were unwilling (34.4% hesitancy).

In terms of sources of COVID-19-related information, our data showed that the mass media (e.g., newspapers, radio, TV; 73.9%) were the main source of COVID-19 vaccine-related information for Ghanaian citizens, followed by Facebook (77.3%) the Internet (49.6%), and the Ghana Health Service (GHS; 48.7%). As a point of concern, the percentage of people accessing the GHS dropped by 28.8% compared to our previous survey in March, in which 74.5% of respondents reported the GHS as a source of COVID-19 vaccine-related information.

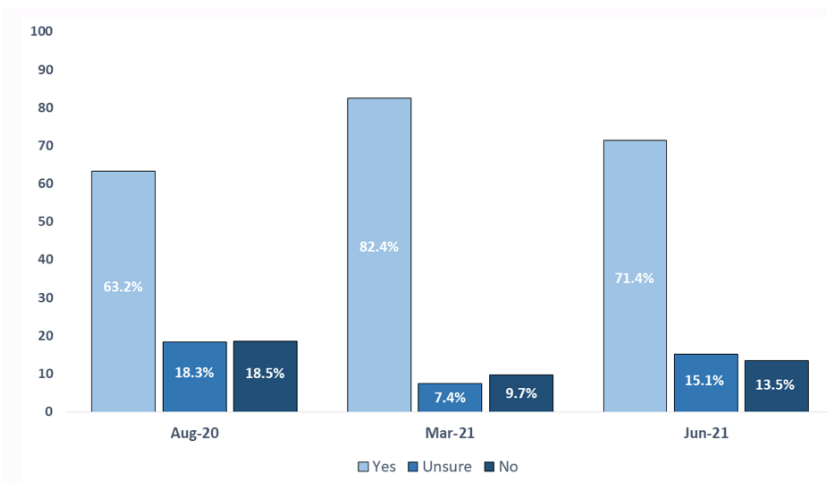


Figure 1. Percentage of Ghanaian recipients’ willingness to receive the vaccine in August 2020, March 2021, and June 2021

Sources of COVID-19 vaccine information

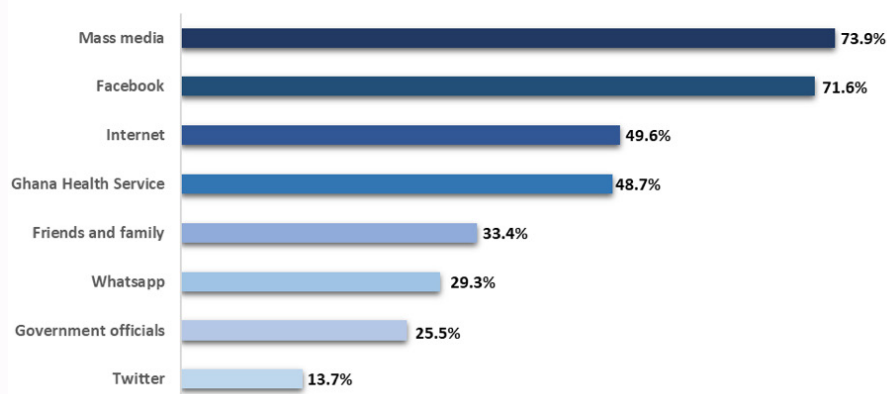


Figure 2. Percentage of sources in which respondents typically retrieve COVID-19-related information (June 2021 survey)

On this note, one reason for the rapid rise in hesitancy could be due to exposure to negative stories relating to the Oxford AZ vaccine on the news and social media. In our sample, 38.9% of respondents reported having seen or heard news stories about the Oxford AZ vaccine. From this subgroup, 19.2% reported that these stories were negative, 16.3% reported that they were neither positive nor negative, and 64.5% reported that they were positive. Similarly, 49.1% reported having read stories about the Oxford AZ vaccine shared on social media, and from this subgroup, 22.3% reported that these

stories were negative, 18.1% reported that they were neither positive nor negative, and 59.6% reported that they were positive. Further, 31.6% of respondents reported that they had recently seen or heard stories about the indecision surrounding the Oxford AZ vaccine rollout in Europe and North America on the news or social media, of which 62.0% agreed that these stories made them feel worried about accepting the COVID-19 vaccine in the future. The actions of the global north can have an impact upon decision-making in other parts of the world.

Table 1. Expressed hesitancy to the COVID-19 vaccine		OR	p-value	95% CI
Age in years		0.99	.604	0.967 – 1.020
Female		1.60	.013	1.106 – 2.310
Urban community		1.42	.029	1.037 – 1.949
Relationship status	Married	0.95	.811	0.602 – 1.488
	In a relationship	0.93	.762	0.626 – 1.409
Education	Higher education (undergrad or postgrad)	1.60	.009	1.270 – 3.269
Being unemployed		0.86	.359	0.634 – 1.180
Religion	Christianity	2.07	.004	1.236 – 3.348
Political beliefs	National Democratic Congress (NDC)	1.76	.012	1.134 – 2.756
	New Patriotic Party (NPP)	0.59	.003	0.419 – 0.833
	Other political party	0.72	.392	0.427 – 1.396
Negative impact of COVID-19 on finances		0.99	.964	0.865 – 1.149
Number of people in family household		0.92	.271	0.952 – 1.014
Personally know somebody who received vaccine (Y)		0.79	.196	0.561 – 1.126
Channels of COVID-19 information	Facebook	0.91	.593	0.648 – 1.282
	Whatsapp	0.92	.654	0.628 – 1.339
	Twitter	1.01	.978	0.636 – 1.591
	Mass media (e.g., radio, newspapers, TV)	1.28	.175	0.894 – 1.847
	Ghana Health Service or health workers	0.70	.040	0.508 – 0.984
	Government officials	0.76	.152	0.515 – 1.109
	Family members or friends	0.90	.536	0.631 – 1.271
	Internet (e.g., Google, news websites, blogs)	1.30	.104	0.947 – 1.797
	Number of participants			
R²				0.117

Notes: Multivariate methods were used to identify the contribution of specific factors, controlling for other factors. Predictors of vaccine hesitancy were examined using a binary regression model. The column labelled OR are the odd ratios for each variable. Dummy variables were used to estimate the effect of categorical variables. Reference categories are male, rural community, single, senior secondary education and lower, employed, Muslim religion, did not vote at the previous general election, and do not personally know somebody who received the vaccine. p-values indicate the level of significance. p-values below 0.05 indicate significance at the 95% confidence level; p-values below 0.01 indicate significance at the 99% confidence level; p-values below 0.001 indicate significance at the 99.9% CLs

References

Brackstone, K., Atengble, K., Head, M., Akinocho, H., Osei, K., Nuamah, K., & Boateng, L. (2021). *Examining drivers of COVID-19 vaccine hesitancy in Ghana*. <https://doi.org/10.6084/m9.figshare.14494851>

Dotto, C., & Cubbon, S. (2021). *Disinformation exports: How foreign anti-vaccine narratives reached West African communities online*. Retrieved 7 July 2021, from <https://firstdraftnews.org/long-form-article/foreign-anti-vaccine-disinformation-reaches-west-africa/>.

Jegade, A. S. (2007). *What led to the Nigerian boycott of the polio vaccination campaign?* PLoS Medicine, 4(3).

Marti, M., de Cola, M., MacDonald, M. E., Dumolard, L., & Ducios P. (2017). *Assessments of global drivers of vaccine hesitancy in 2014 - Looking beyond safety concerns*. PLoS One, 12(3).

Samarasekera, U. (2021). *Feelings towards COVID-19 vaccination in Africa*. The Lancet Infectious Diseases, 21(3).

Ethics

The study was reviewed and approved by the Psychology Ethics Committee, University of Southampton, UK (ref: 57267).

Peer Review

The findings reported in this policy brief have not been subjected to a formal peer review. A manuscript is currently being prepared for pre-print.

Acknowledgements

We are grateful for funding provided by the University of Southampton Strategic Development Fund and ESRC Impact Acceleration Account (IAA).

In collaboration with



CENTER FOR RESEARCH
AND OPINION POLLS
La science au service des décideurs





For more information

www.the-ciru.com/resin-global-health-pandemic

Contact

Ken Brackstone, Ph.D.
Research Fellow at Clinical Informatics Research Unit
University of Southampton

K.Brackstone@soton.ac.uk

Laud Boateng, MD, MPH, MPA
Public Health Physician
Ghana Health Service (GHS)

laudex9@gmail.com