

DATA SYNTHESIS:

COVID-19 VACCINE PERCEPTIONS IN AFRICA: SOCIAL AND BEHAVIOURAL SCIENCE DATA, MARCH 2020-MARCH 2021

Safe and effective vaccines against COVID-19 are seen as a critical path to ending the pandemic.¹ This synthesis brings together data related to public perceptions about COVID-19 vaccines collected between March 2020 and March 2021 in 22 countries in Africa. It provides an overview of the data (primarily from cross-sectional perception surveys), identifies knowledge and research gaps and presents some limitations of translating the available evidence to inform local operational decisions. The synthesis is intended for those designing and delivering vaccination programmes and COVID-19 risk communication and community engagement (RCCE).

5 large-scale surveys are included with over 12 million respondents in 22 central, eastern, western and southern African countries (note: one major study accounts for more than 10 million participants²); data from 14 peer-reviewed questionnaire surveys in 8 countries with n=9,600 participants and 15 social media monitoring, qualitative and community feedback studies. Sample sizes are provided in the first reference for each study and in Table 13 at the end of this document. The data largely predates vaccination campaigns that generally started in the first quarter of 2021. Perceptions will change and further syntheses, that represent the whole continent including North Africa, are planned.

This review is part of the Social Science in Humanitarian Action Platform ([SSHAP](#)) series on COVID-19 vaccines. It was developed for SSHAP by Anthrologica. It was written by Kevin Bardosh (University of Washington), Tamara Roldan de Jong and Olivia Tulloch (Anthrologica), it was reviewed by colleagues from PERC, LSHTM, IRD, and UNICEF (see acknowledgments) and received coordination support from the RCCE Collective Service. It is the responsibility of SSHAP.

This document is structured as follows: 1) the themes arising in the data and 2) operational and methodological considerations, 3) the full synthesis.

SUMMARY OF THEMES

Vaccine acceptance was varied, but patterns were discernible.

- Reported likelihood of taking a vaccine was quite high across the countries sampled. There was a substantial degree of variation between studies (e.g. 59% and 85% intention for participants in one country but different studies) and between countries (e.g. 59% to 94% intention in different countries within one study).
- The lowest levels of acceptance were reported in some Francophone West and Central African countries.

Demographic factors did not have a clear impact on vaccine acceptance.

- Some studies suggested there may be higher acceptance among older populations compared to younger age groups, higher income and higher levels of education also *usually* correlated with higher acceptance.
- Preferences according to rural-urban residence appeared to vary considerably between countries, there was also substantial variation within regions of countries.

There were different drivers of low perceived risk of COVID-19

- In many countries there was low perception of *personal* risk of COVID-19, this was often alongside a belief that the virus would however affect many others in the country.
- Attitudes towards vaccination were affected by popular understandings of the virus: its origins, perceived risk profile such as mortality and severe illness rates, ideas of natural immunity and the impact of variants on vaccine effectiveness.

Concerns about COVID-19 vaccines often related to safety and side effects

- Survey participants reported concern about multiple issues: vaccine ingredients, rushed vaccine trials, and the use of mRNA-based technologies, among other concerns.

Communities had concerns about who would receive or be prioritised for vaccination

- Concerns were reported about affordability and a lack of transparency on prioritisation decisions and distribution of vaccines. Fears about forced and mandatory vaccination were also circulating, creating fear, distrust and conspiratorial ideas.

Perceptions of geopolitics and vaccine nationalism fuelled concerns

- There were widespread concerns that the vaccine would not be accessible in the region due to lack of funds, incompetence or corruption. Concern that vaccines were developed and manufactured outside Africa, lack of transparency, and the criteria for vaccines to be included in COVAX contributed to suspicion.
- There were important concerns about collusion serving the interests of national governments and external actors in 'coronabusiness'. These influenced perceptions of

vaccine delivery and safety. Such findings are not specific to COVID-19 and are reminiscent of narratives during other disease outbreaks (such as Ebola).

Multiple rumours, conspiracy theories and misinformation have been circulating

- Alternative narratives about the pandemic and the vaccines (rumours, conspiracy theories, misinformation) were numerous, complex and varied and were filling the information vacuum that remained in many places. However, the impact of these on behaviours still appeared limited, for example, those who believed in conspiracy theories were still willing to be vaccinated. Local social norms may be more influential on people's actions than rumours or misinformation.

The degree of community involvement and social norms influenced vaccine acceptance

- Efforts began in many African countries in early 2021 to build public trust in COVID-19 vaccination campaigns. There was some discontent that community organisations and other stakeholders were not involved in these and this was attributed as one of the causes of popular mistrust of health authorities.
- Important gaps in the information available to communities were reported. Lack of information was cited as a reason for vaccine hesitancy in some studies.

Trust in authorities and medical institutions influenced vaccine acceptance

- There was some relationship between people's overall trust in authorities (including medical institutions), their satisfaction with the national response to COVID-19 and vaccine acceptance.
- Healthcare professionals, medical institutions and the WHO were seen to have an important role to play in vaccination communication and engagement. Healthcare workers' acceptance of the vaccines was low in some settings.

COVID-19 has had a negative impact on routine immunisation

- Studies revealed that discourses about other vaccines were tied to COVID-19 vaccines, confusion included whether other vaccines prevent COVID-19 and concerns that other vaccines may spread COVID-19. Some data also suggest that COVID-19 may have increased confidence in vaccination for some people. COVID-19 restrictions and community perceptions of contagion have had a negative impact on routine (non-COVID-19) immunisation access.

CONSIDERATIONS FROM THESE DATA: OPERATIONAL AND METHODOLOGICAL

- Studies showed some conflicting results on similar demographic variables (age, gender, education, socioeconomic status, residence and ethnicity) and vaccine hesitancy. While this should caution drawing firm conclusions from the data, it was possible to identify patterns and critical themes to guide operational response and RCCE.
- Aberrant findings may have been due to real contextual effects, timing and other events at the time surveys were administered, but are also likely affected by methodological differences (framing of questions, convenience sampling etc.)
- To maximise the usefulness of vaccine perception data syntheses for individual countries, it is important to agree on 1) some core indicators and 2) principles for data-collection against those indicators, to facilitate a level of standardisation. Further debate on this at global level with strong representation from countries is required. These indicators and principles could then be harmonised across different platforms, such as the RCCE Collective Service [behavioural indicators](#) (being developed) and the global immunization programme information management system.
- Agreeing principles for future data collection on vaccine perceptions could include: 1) defining the constructs; 2) providing examples for how to make appropriate adaptations of questions in different settings while ultimately retaining the same meaning; and, 3) offering guidance on standardising response options. Guidance on gathering and using data to understand intentions on vaccination are [available](#).
- Standardised vaccine perception data collection could provide a range of country specific experiences that become illustrative of a general practice or trends. This would be the ideal to inform programming and RCCE initiatives at country level.
- The data in this synthesis are primarily from online sources supported by some qualitative data, there is a need to triangulate these further with data collected through off-line social listening (e.g. hotlines). Internet penetration is limited in many of the countries included. Perceptions collected through social listening and online surveys represent a limited part of the population.
- RCCE strategy is most effective when developed at local and national levels. The qualitative data in this synthesis was crucial for starting to understand perceptions. Qualitative, context-specific social and behavioural research to complement data from quantitative surveys should be considered the core enabler to successful COVID-19

vaccine deployment. It can provide understanding of diverse perceptions, and guide operations that address concerns, which build trust and confidence.

- Vaccine supply to the continent remains a major issue, at time of publication vaccine perception surveys data remained about intent rather than practice and may change significantly when vaccines become more obviously available, and campaigns are more advanced.
- The data showed clearly that inclusion of community organisations in the COVID-19 response is very important, this can help ensure vaccination information is targeted to their current needs and is responsive to their social norms.
- Partnerships to deploy vaccines should make use of capacities available across sectors, disciplines and in civil society to develop a shared goal of effectively deploying COVID-19 vaccines. Understanding and responding to low acceptance of vaccines by healthcare workers and influential figures, where it exists, will be crucial.
- It will be important to 'unpick' the reasons for the low perceived threat of COVID-19 at local levels, and to understand how these can motivate people to 'explain away' the need for a vaccine so that operational responses can be crafted appropriately. For example, it would be useful to look at the interplay of vaccine perception data and other influences, such as political pronouncements from influential figures, or longstanding mistrust of vaccines prior to the pandemic.

CONTENTS

DATA SYNTHESIS	7
1. The rate of potential vaccine acceptance was varied but patterns were discernible	7
2. Demographic factors did not have a clear impact on vaccine acceptance	10
3. There were different drivers of low perceived risk of covid-19	13
4. Concerns about the COVID-19 vaccines often related to safety and side effects	15
5. Communities had concerns about who would receive or be prioritised for vaccination	17
6. Perceptions of geopolitics and vaccine nationalism fuelled concerns	19
7. Multiple rumours, conspiracy theories and misinformation have been circulating	20
8. The degree of community involvement and social norms influenced vaccine acceptance	22
9. Trust in authorities and medical institutions influenceD vaccine acceptance	23
10. COVID-19 has had a negative impact on routine immunisation	26
FURTHER RESOURCES	28
ACKNOWLEDGEMENTS	28
CONTACT	28
DATA SOURCES	30
REFERENCES	33

Background

By April 2021 more than 4.2 million confirmed cases and nearly 113,000 COVID-19 deaths had been reported on the continent by the [Africa CDC dashboard](#), although it is widely acknowledged that the true scale of COVID-19 in most countries is much greater than these reported figures. Launched in 2020 by Africa CDC, the COVID-19 Vaccine Development and Access Strategy aims to immunise at least 60% of the African population (or 780 million people) by 2022 with vaccines that are proven safe and efficacious and are quality-assured to international standards to develop “herd immunity.”² By April 2021, 45 African countries had received shipments of COVAX vaccines³ and administered 18 million doses, progress is being monitored by [Africa CDC](#).

1. THE RATE OF POTENTIAL VACCINE ACCEPTANCE WAS VARIED BUT PATTERNS WERE DISCERNIBLE

Studies articulated questions related to vaccine acceptance in slightly different ways, however, data triangulated from five large-scale surveys suggest that community acceptance of potential COVID-19 vaccines in Africa is generally quite high, albeit with substantial variation between countries. The results from these surveys, with data separated by country are summarised in Table 1. An Africa CDC survey (data shown here from 13 out of 15 countries, n=13,699, Sept-Dec 2020) found the highest overall acceptance: 79% of respondents would agree to take a COVID-19 vaccine if it was deemed safe and effective. Ethiopia (94%) reporting the highest acceptance rate and the DRC (59%) the lowest.⁴ The largest survey was implemented by Facebook and the University of Maryland⁵ where over 12 million people (April 2021) were surveyed, data from the 4 countries with large sample sizes (South Africa, Kenya, Nigeria and Sudan) found an average of 68% of respondents would accept a COVID-19 vaccine. In telephone surveys by the Partnership for Evidence-Based Responses to COVID-19 (PERC),⁶ an average of 65% respondents were planning to get vaccinated, with wide variation between countries (35%-85%)(data here from 16 out of 19 countries n=21,774, Feb 2021). A fourth large online survey (n=44,784 July and n=38,502 November 2020) in 11 countries by Johns Hopkins University (JHU) found lower acceptance, averaging 55% in July 2020 and 59% in Nov 2020 and again considerable range between countries (38%-70%) (November 2020).⁷ A study by GeoPoll in November 2020 (n=3,000) in 6 countries found that 62% would definitely (42%) or probably (20%) get a COVID-19 vaccine as soon as possible if it were freely available.⁸ Contextual differences and timing and is likely to account for much of the variation between countries, as well as some methodological explanations (framing of questions, convenience sampling etc. for aberrant findings .

Table 1. Potential COVID-19 vaccine acceptance in 22 countries, results from the five large-scale surveys

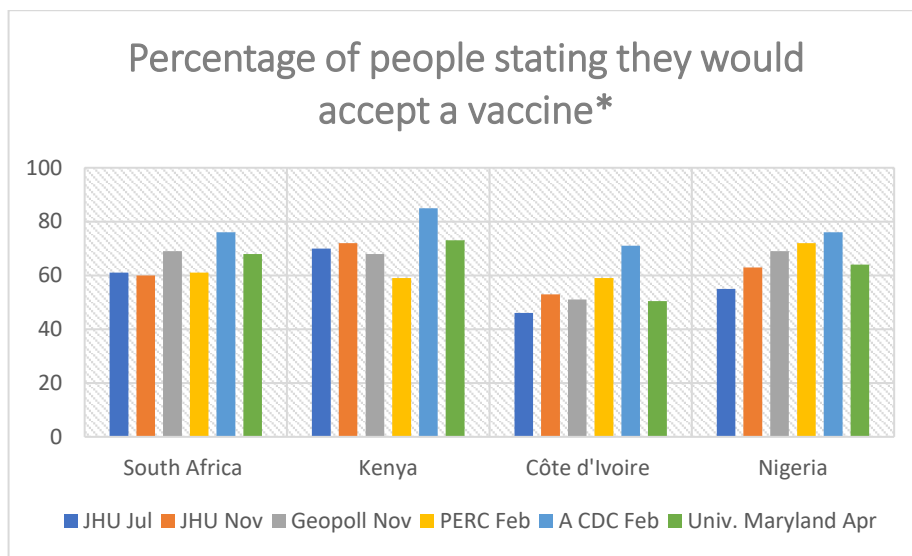
Study	<u>Africa CDC</u> September-December 2020		<u>JHU</u> November 2020 (% change since July)		<u>PERC</u> February 2021*		<u>GeoPoll</u> November 2020		<u>Univ. of Maryland / FB</u> ** April 2021	
Variable	Would take a publicly available vaccine, if safe and effective		Would accept a vaccine if one were available		Would be vaccinated if a safe & approved COVID-19 vaccine were available		Would get a free COVID-19 vaccine if available today		Would be vaccinated if offered a COVID-19 vaccine today	
	n	%	n	%	n	%	n	%	n	%
Angola			3,431	57% (↑1%)						
Burkina Faso	1,037	86%								
Cameroon			3,738	38% (↑5%)	1,323	35%				
Côte d'Ivoire	1,039	71%	3,171	53% (↑ 7%)	1,397	59%	500	51%		
DR Congo	1,007	59%			1,316	52%	500	46%		
Ethiopia	1,001	94%			1,483	76%				
Gabon	1,112	67%								
Ghana			3,868	60% (↑9%)	1,298	58%				
Guinea					1,302	86%				
Kenya	1,000	85%	3,541	72% (↑2%)	1,461	59%	500	68%	4,005,000	73%
Liberia					1,313	70%				
Mali	1,009	80%								
Mozambique			3,936	61% (↓ 1%)	1,333	75%	500	68%	2,204,000	64%
Nigeria	1,172	76%	3,853	63% (↑8%)	1,318	72%	500	69%		
Niger	1,173	93%								
South Africa	1,056	76%	3,916	60% (↓1%)	1,639	61%	500	69%	4,817,000	68%
Senegal	1,010	65%	2,471	41% (↓3%)	1,353	66%				
Sudan	1,075	86%			1,380	78%			1,332,000	66%
Tanzania			3,174	66% (↑2%)						
Uganda	1,008	87%	3,403	71% (↑ 9%)	1,246	85%				
Zambia					1,328	53%				
Zimbabwe					1,284	61%				
Total	13,699***	79%	38,502	59%	21,774	65%	3,000	62%	12,358,000	68%

* Data included from 16 out of 19 countries. ** Data collected from 18 countries, but the great majority of respondents are from the 4 countries included in the table. *** Data included from 13/15 countries in this table and most references in this document

The surveys framed the question about vaccine acceptance hypothetically. For example, “If a safe and approved vaccine against COVID-19 were to become available, how likely would you be to get vaccinated?” It is not clear how respondents understood or interpreted ‘safety’. Hypothetical questions rarely get the same results as when a product becomes available and these vaccine intention data in the absence of an available product will likely be different from when supplies become available. The responses should therefore be considered as indicative.

Four countries (South Africa, Nigeria, Côte d'Ivoire and Kenya) were surveyed in all five large-scale surveys, vaccine acceptance data from these are summarised in Figure 1 illustrate the degree of variability between those surveys.

Figure 1. Vaccine acceptance data across 5 studies and 4 countries (% of people sampled)



* Data sources: John Hopkins University (JHU) 2020; GeoPoll November 2020; PERC February 2021, Africa CDC February 2021; and Facebook & the University of Maryland in April 2021.

The survey data suggest that some Francophone countries (specifically Cameroon, Côte D'Ivoire, Senegal and DRC) had much lower vaccine acceptance rates compared to other countries. A major [Afrobarometer](#) study including four Francophone countries was published after this synthesis. The three Francophone countries included in the JHU survey had the lowest acceptance rates (Cameroon (38%), Côte D'Ivoire (53%), Senegal (41%))⁷ while the two Francophone countries (DRC and Côte D'Ivoire) in the GeoPoll survey were also less likely to accept the vaccine compared to Kenya, Mozambique, Nigeria, and South Africa.⁸ A small telephone survey (n=215, Oct 2020) in four Francophone countries (Senegal, Burkina Faso, Benin, Cameroon) found that 15% would accept a COVID-19 vaccine (62% would refuse and 23% had not yet decided), with relative homogeneity between countries.⁹ Other surveys, however, suggested that this finding is not generalisable to all Francophone countries: data from the Africa CDC study show Côte D'Ivoire, Senegal and DRC were lower than other countries, yet the survey data from Burkina Faso and Niger and Mali were relatively high (Africa CDC).⁴ Similarly, the PERC

survey found that Guinea (86%) had the highest acceptance rate while Cameroon (35%) had the lowest.^{10,11} Guinea's recent history of Ebola elimination through vaccination may account for some degree of the positive results there. Overall, the framing of the question with the concept of safety, may have influenced these results. Perceptions on safety are presented further in section 4.

2. DEMOGRAPHIC FACTORS DID NOT HAVE A CLEAR IMPACT ON VACCINE ACCEPTANCE

Studies showed some conflicting results regarding demographic factors and potential acceptance.

Gender - The large Africa CDC survey in December 2020 did not find overall significant gender differences in self-reported COVID-19 vaccine acceptance (Table 2). A number of smaller-scale studies did find gendered differences that are more consistent with global studies in which women tend to be less inclined to vaccinate.

Table 2: Gendered differences in vaccine hesitancy

Location	Result	Data source/ sample size
No clear differences in vaccine acceptance between men and women		
13 countries: Burkina Faso; Côte D'Ivoire; DRC; Ethiopia; Gabon; Kenya; Mali; Nigeria; Niger; Senegal; South Africa; Sudan; Uganda	80% men and 78% women	Africa CDC (n=13,699 September-December 2020) ⁴
Women appear to be less likely to accept COVID-19 vaccination in the smaller studies		
Nigeria	Males were 1.5 more likely to be willing to receive the vaccine than females	Olomofe et al. (n=776, June- July 2020) ¹²
Ethiopia	Vaccine hesitancy was associated with being female	Dereje et al. (n=422, January) ¹³
DRC	Females (21%) and males (38%) would get vaccinated if the COVID-19 vaccine was available	Ngoyi et al. (n=439, Sept 2020) ¹⁴
Western Uganda	Males 1.5 to 2 times more likely to be willing accept COVID-19 vaccines than females	Echoru et al. (n=1067, July to September 2020) ¹⁵

Age - Some studies suggest differences in acceptance based on age. Many of these suggest higher rates among older populations compared to younger age groups (Table 3).

There were limited data on how different populations viewed the need for age-specific COVID-19 vaccination strategies. Dereje et al. in Ethiopia (n=442) found that 20% of participants thought that children should not get vaccinated, largely because they believed that the virus did not affect children or it would be too dangerous for them.¹³

Conversely, Olomofe et al. in Nigeria (n=776, June-July 2020), and in line with other vaccine perception surveys, found 30% thought vaccines are only for children and not for adults.¹² Vaccination campaigns in some countries may need to consider the shift required of vaccination programmes that prioritise adults.

Table 3: Age differences in vaccine acceptance

Higher rates of likely COVID-19 vaccine acceptance in older population groups		
13 countries: Burkina Faso; Côte D'Ivoire; DRC; Ethiopia; Gabon; Kenya; Mali; Nigeria; Niger; Senegal; South Africa; Sudan; Uganda	Older age groups were more inclined to be willing to accepting a COVID-19 vaccine.	Africa CDC (n=13,699, September-December 2020) ⁴
6 countries: Kenya, South Africa, Nigeria, Côte D'Ivoire, DRC, Mozambique	Acceptance: 59% in 15-24 yr olds Acceptance: 62% in >36 yr olds	GeoPoll (n=3,000, November 2020) ⁸
South Africa	Acceptance: 64% in 18-24 yr olds Acceptance: 74% in > 55 yr olds	Runciman et al. (n=10,618, January 2021) ¹⁶
Other outcomes based on age		
Ethiopia	35-44 age category less likely to accept a COVID-19 vaccine (67%) compared to other age groups	UNICEF CRA (n=987, December 2020) ¹⁹
Western Uganda	61-70 age category less likely to accept the vaccine	Echoru et al. (n=1067, July to September 2020) ¹⁵

Education and socioeconomic status – The Africa CDC survey found limited influence of education levels on COVID-19 vaccine acceptance, while respondents who were unemployed were only marginally less likely to accept a COVID 19 vaccine compared to those with employment.⁴ The PERC studies found that acceptance was marginally more in the lower income countries and in groups in the lower levels education attainment.⁶ Other smaller-scale studies (Table 4) found that education was related to both increased and decreased acceptance, depending on the study. Three studies found very low reported acceptance of a hypothetical COVID-19 vaccine among healthcare workers in DRC, Uganda and Zambia –these studies were conducted in mid-2020 and may not be representative of current perceptions and beliefs, although it should be noted that DRC and Zambia generally reported lower levels of acceptance. There were important data from the DRC and Zambia which suggested low levels of acceptance from healthcare workers.^{24,23} Understanding and responding to vaccine hesitancy by healthcare workers, where it exists, will be crucial.

Table 4: Education and socioeconomic status differences and COVID-19 vaccine hesitancy

Acceptance according to socioeconomic status		
Zimbabwe, Cameroon, Sudan, Uganda	Acceptance was higher among those with higher income in Zimbabwe (66% vs 56%) and Cameroon (59% vs 44%). In Sudan (72% vs 82%) and Uganda (82% vs 90%) the opposite trend was seen, low income was associated with higher vaccine acceptance.	PERC (n=21,774, February 2021) ⁶
South Africa	The poor and the wealthy were more likely to accept vaccination in comparison to those “reasonably comfortable” or “just getting by.”	Runciman et al. (n=10,618, January 2021) ¹⁶
DRC	Participants in the middle- or high-income category were more likely to accept COVID-19 vaccination	Ditekemena et al. (n= 4131, August- September) ²⁰
Acceptance according to education and employment status		
South Africa	Vaccine acceptance decreased with education level: “Definitely/probably willing to be vaccinated” Tertiary education 72% vs. Higher education 59%	Runciman et al. (n=10,618, January 2021) ¹⁶
Tanzania	Higher acceptance among college-graduates in Tanzania	WorldVision, Barrier analysis (December 2020) ²¹
Uganda	Acceptance, confidence and trust for COVID-19 vaccine clinical trials decreased with education level among HCW	Kasozzi et al. (n=260 HCW, September-October 2020) ²²
DRC	28% of HCW would accept a COVID-19 vaccine	Kabamba Nzaji et al. (n=613 HCW, May 2020) ²³
Zambia	47% of HCW would accept a COVID-19 vaccine	Chawe et al. (n=208 HCW, June 2020) ²⁴

Residence and ethnicity – The data (Table 5) found some differences between respondents in villages versus urban areas as well as between different regions and ethnic groups, albeit the data were limited. The Africa CDC survey found that overall willingness to accept a new COVID-19 vaccine was marginally higher among people who live in rural areas compared to those who living in cities – albeit with participants in Sudan and South Africa were ~10% more likely to be vaccine hesitant in rural areas.⁴ Data from the PERC survey found no overall difference between urban and rural populations (64% vs 66%),⁶ although some country trends were observed (Table 6). Smaller-scale studies in Uganda and Nigeria found important regional differences. In northern Nigeria, this is likely due to previous polio vaccine hesitancy and resistance. Only one study (in South Africa) specifically asked about ethnicity.

Table 5: The influence of residence and ethnicity on potential COVID-19 vaccine acceptance

Nigeria, D'Ivoire	Côte	Highest differences in Nigeria: rural populations (76%) vs urban (66%). And the opposite in Côte D'Ivoire where urban (63%) populations seem more acceptant than rural (55%).	PERC (n=21,774, February 2021) ⁶
Nigeria		Southerners were more receptive to vaccination than northerners	Enitan et al. (n=465, May 2020) ²⁵ and Adebisi et al. (n= 517, Aug 2020) ²⁶
DRC		Willingness for vaccination was highest in central and eastern Kasai (84%) and lowest in Haut Katanga and Kwilu (less than 40%) and Kinshasa (41%).	Ditekemena et al. (n=4131, August-September 2020) ²⁰
Uganda		Vaccine confidence among HCW was lowest in the more developed regions of central and western Uganda.	Kasozi et al. (n=260 HCW, September-October 2020) ²²
South Africa		South African adults were roughly twice as likely to be hesitant to a COVID-19 vaccine (31%) compared to Black South Africans (17%) or Indian/Asian adults (14%).	Runciman et al. (n=10,618, January 2021) ¹⁶

3. THERE WERE DIFFERENT DRIVERS OF LOW PERCEIVED RISK OF COVID-19

Data suggested that there was low perceived risk of COVID-19, the drivers of which were varied, but which can all affect perceptions of the need or acceptability of vaccination. The Africa CDC survey found that more than half of respondents believed that the threat of COVID-19 was exaggerated, with no difference between those who believed vaccines in general are safe and those who thought vaccines are not safe.⁴ Data from the PERC survey revealed 22% of respondents who would not get a vaccine stated it was because they did not feel they were at risk; people often viewed COVID-19 risk abstractly, with 67% believing that the virus would affect many people in their country but only 29% believing that they were at personal risk of being infected.⁶ Country differences are presented in Table 6. The perceptions in these data did not tally clearly with the Africa CDC survey in which 80% of respondents reported that a COVID-19 vaccine was important (with Côte D'Ivoire, DRC, Gabon and Senegal among the lowest).⁴

Table 6: Community perceptions of COVID-19

Believes that the threat of COVID-19 is exaggerated	
Niger 79%; Senegal 79%; Sudan 73%; Nigeria 67%; DRC 65%	Africa CDC (September-December 2020) ⁴
Believes that COVID-19 will affect many people in their country vs believes that their personal risk of being infected with COVID-19 is high	
Ethiopia 81% vs 32%; Kenya 62% vs 22%; Uganda 72% vs 31%; Sudan 84% vs 24%; Ghana 51% vs 22%; Nigeria 61% vs 23%; Liberia 57% vs 34%; Côte D'Ivoire 33% vs 19%; Guinea 62% vs 18%; Senegal 77% vs 32%; Cameroon 49% vs 20%; DRC 58% vs 26%; Mozambique 88% vs 47%; South Africa 86% vs 49%; Zambia 75% vs 38%; Zimbabwe 69% vs 26%	PERC (n=21,774, February 2021) ⁶

Sub-narrative analysis of media monitoring from East and Southern Africa in November, suggested that many people believed a COVID-19 vaccine was not needed because the immune system is more effective at tackling the virus, that the mortality rate of COVID-19 does not warrant a vaccine and that the pandemic has not been particularly severe in Africa.²⁷

The reported low levels of mortality and severe cases and harsh lockdown policies in Africa – the so-called African paradox – has generated contradictory understandings of the pandemic, and sometimes confusion, suspicion and questioning for the need behind mass vaccination.²⁸ There are likely various explanations, according to context. For example, low vaccine acceptance found in Cameroon (see Section 1) may have been reflective of the announcement, on 23 Feb 2021, by the Cameroonian Minister of Health that the current epidemiological situation did not necessitate a vaccination campaign.¹⁰ Statements such as: *"I've got real doubts about the vaccine"* made by Kenyan Health Cabinet Secretary Kagwe are also likely to have had an impact.²⁷ Kasozi et al. in Uganda found that 87% of healthcare workers (n=260, September-October 2020) did not think COVID-19 vaccines were necessary to stop the pandemic.²² While studies in Nigeria found that respondents not wanting a COVID-19 vaccine noted that *"the immune systems is sufficient"*²⁶ and *"the vaccine is not needed since infection is harmless"*.¹²

People had many questions about why a vaccine is needed given perceptions of innate immunity in Africa and the epidemiological risk profile on the continent. Data from media monitoring from November 2020 stated for instance: *"A vaccine stimulates my immune system to develop antibodies against COVID-19. My immune system does exactly the same on its own. Why would I need a vaccine?"* (South Africa).²⁷ Community feedback data collected in December 2020 shows statements like: *"It would be better to use this vaccine in Asian and European countries where the mortality rates are very high"* (Gabon).²⁹ Internews data collected in Mali also found those trends: *"It is like the common cold, infectious but very harmless."*³⁰ There is a perception that Africans are immune to COVID-19: *"I say if you catch the virus trust your immune system and grandmother's recipe: lemon, honey, olive oil"* (Mali).³⁰ Others were motivated by the belief that they were generally healthy and therefore strong enough to fight infections, for example, *"I believe I am strong enough to survive a covid infection."* (South Africa)¹⁶

Despite the low risk associated with COVID-19 in many studies, some data suggests that a large number of people were practicing protective behaviours, while some reported taking supplements and medicines that they believed protect them from the disease.³⁰ Social media monitoring found reported beliefs that a vaccine is not needed when there are potential treatments (e.g. chloroquine) or traditional medicines available (e.g. in relation to Madagascar's decision to not participate in COVAX).²⁷ Some media monitoring showed that vaccines were being framed as the only alternative to lockdown policies and will *"bring everything back to normal"*.^{27,31}

4. CONCERNS ABOUT THE COVID-19 VACCINES OFTEN RELATED TO SAFETY AND SIDE EFFECTS

Many of the reasons given for not being willing to accept COVID-19 vaccination related implicitly or explicitly concerns about safety. In the Africa CDC survey, 78% of respondents in the 15 countries agreed that vaccines *in general* are safe but only 68% said a COVID-19 vaccine would be safe (Table 7). In the PERC surveys, 19% of respondents (9 countries) believed that vaccines could give you the disease they are designed to protect against (with Ghana highest percentage 33%).⁶

Table 7: Concerns about vaccine safety

Influence of safety on acceptance	60% of those not to be willing to accept a COVID-19 vaccine cited concerns about safety 16% of those willing to accept a COVID-19 vaccine cited concerns about safety 59% reporting that vaccines are not safe would still accept vaccination 13% reporting vaccines are safe would refuse vaccination	Africa CDC (n=13,99 September-December 2020) ⁴
Range in perceptions that a COVID-19 vaccine is safe	Lowest: Senegal and DRC (49%) to highest: Ethiopia (85%) and Niger (78%)	
COVID-19 vaccine is as safe as general vaccinations	Ethiopia was one of the very few countries reporting this: 85% safety for both variables	

Interestingly, however, the majority of those in the Africa CDC survey who reported that vaccines are not safe would still accept a new COVID-19 vaccine.⁴ Only one identified study explored the relationship between chronic health conditions and COVID-19 vaccine acceptance; Olomofe et al. (n=776, Jun-July 2020) found that 25.5% of respondents in Nigeria stated they have other medical conditions that would not allow them to take it.¹²

A mixed methods study in four francophone countries (Senegal, Burkina Faso, Benin, Cameroon; n=215, Oct 2020) summarised the following reasons as conditions for respondents to move from vaccine refusal to acceptance: 1) learning about the scientific validation of the vaccine in their country, 2) hearing about experiences from other countries, and 3) accessing scientific information just prior to vaccination.⁹ IPSOS online data from South Africa (n= >500, Jan 2021) found that, of those who would not be willing to receive a COVID-19 vaccine, 39% cited concerns about side effects and 33% that the rushed nature of the clinical trials as the main reason.³⁴ Africa CDC data confirmed those concerns, for example: “*It normally takes 15 years to manufacture a vaccine so how can a new vaccine be manufactured in just a year?*” (DRC) and “*The vaccine should be tested in Europe first.*” (Senegal).⁴ Adebisi et al. (n= 517, Aug 2020) in Nigeria found that among those who would not accept the vaccine, 37% the stated that the clinical trials had been inadequate.²⁶ In the PERC survey, a total of 22% of respondents in Ethiopia, Kenya, Uganda, Ghana, Senegal and Zimbabwe believed that the development of the COVID-19 vaccines had been rushed.⁶ Participants who would likely not accept the vaccine, from a

study in South Africa, voiced concerns: “According to the knowledge I got from school the long term effects of the vaccine are unknown and the vaccine has not been tested enough and the trials took a short time” and “Am concerned about the speed of its development and release, and about the possible lack of proper testing.”¹⁶

Media monitoring by UNICEF ESARO C4D in November 2020 also found many concerns about the vaccines being developed too quickly and that the process of clinical trials was not transparent; for example, rushed assessments of trial pauses after potential side effects (e.g. in the case of the Oxford trial in Brazil where a volunteer died and details were not given due to confidentiality) and concerns about side effects.²⁷ Also in November, statements by Kenyan Health Cabinet Secretary doubting the safety of the Pfizer vaccine were widely discussed on Twitter across countries in the region.^{27,35} In late January 2021, Tanzania's late President John Magufuli dismissed COVID vaccines as "dangerous for our health" and Andry Rajoelina, the president of Madagascar emphasised the potential for herbal remedies.

Community feedback data from Internews collected about fear of side effects stated identified concerns, such as: “The vaccine doesn't seem to be completely perfect. Some lives may be in danger” – Gabon, Social Media, December 2020.³⁰ Media monitoring found comparisons to the long efforts to develop effective vaccines for other diseases that have not yet been eliminated, such as malaria, or flu, stating that those diseases kill more people in Africa than COVID-19.^{27,36,37} Desclaux found doubts about the capacities and systems for monitoring the occurrence of serious adverse reactions linked to the vaccines, financial incentives to hide side effects and the suspected exemption of companies that have introduced an additional theme of mistrust.³⁸ There are scant data on community perceptions of systems on pharmaco-vigilance. In-depth interviews (n=24) in Ethiopia found concerns about efficacy, side effects, the experimental nature of COVID-19 vaccines and preference for other prevention measures.¹³ Muslim communities on social media expressed concerned about whether the vaccines would have ingredients not considered permissible under Islamic law.³¹ Islamic associations have released statements to recommend immunisation for COVID-19 for eligible individuals, assuring that the vaccines do not contain any human or animal ingredients, for instance the Islamic Medical Association of South Africa stated vaccination as an ‘obligation’ to reduce risk to adverse circumstances.³⁹ Data relating to perceptions of Christian or other religious groups were not accessed.

Social media monitoring from December 2020 found rumours of adverse effects discussed online including potential strong allergic reactions, Bell's Palsy, and a potential increased risk of HIV infection.³¹ Other arguments against the vaccine suggest a potential cost to the immune system, that the vaccine will cause infertility²¹ and, in Senegal, Benin and Guinea, the death of vaccinated children.⁹ A number of studies also found concerns about the new mRNA-based technology used in some COVID-19 vaccines. Among

healthcare workers in Uganda, Kasozi et al. found 67% of participants (n=174/260, September-October 2020) who expressed distrust for COVID-19 vaccinations noted the use of mRNA-based technology.²² In South Africa, popular social media content included Chief Justice Mogoeng calling the COVID-19 vaccine “*the vaccine of the devil*”, which was then praised by a South African pastor: “...*Let us all pray against any COVID vaccine that will corrupt our DNA...*”. Also a social media post noted that “*This new vaccine changes the DNA*”.⁴⁰

Data also showed concerns about the impact of COVID-19 variants on vaccine effectiveness, particularly in South Africa where the B.1.351 was first identified and debates about the efficacy of the vaccine for variants.³¹ Media monitoring in January 2021 by UNICEF found widely discussed news that existing vaccines have lower efficacy against the variant of the virus identified in South Africa.³³

5. COMMUNITIES HAD CONCERNS ABOUT WHO WOULD RECEIVE OR BE PRIORITISED FOR VACCINATION

The WHO’s Strategic Advisory Group of Experts on Immunization (SAGE) developed a [Roadmap for Prioritizing Uses of COVID-19 Vaccines](#) that considers the priority populations for vaccination based on epidemiologic setting and vaccine supply scenarios. Many African countries obtained their first shipment of COVID-19 vaccines in March 2021 and at time of publication appeared to be prioritising healthcare workers, teachers among other high-risk groups⁶ Some committed to large-scale population vaccination campaigns (Senegal aims to vaccinate 20% of its population by the end of 2021) while others have not made COVID-19 vaccination a priority. Cameroon, for example, stated the epidemiological situation did not merit an emphasis on vaccination.^{10,41} Studies found that respondents differed slightly as to whom they felt should be prioritised (Table 8) the largest priority groups identified in the Africa CDC study were healthcare workers and the elderly⁴.

Table 8: Community perceptions about vaccine access

Who should be prioritised for COVID-19 vaccination?		
13 countries: Burkina Faso; Côte D'Ivoire; DRC; Ethiopia; Gabon; Kenya; Mali; Nigeria; Niger; Senegal; South Africa; Sudan; Uganda	Healthcare workers (32%), the elderly (28%), that no group should be prioritised (27%), children (26%) and the most vulnerable (25%).	Africa CDC (n=13,699, September-December 2020) ⁴
What portions of the population will receive a vaccine first?		
6 countries: Kenya, South Africa, Nigeria, Côte D'Ivoire, DRC, Mozambique	HCW 29%; ‘those who can pay’ 23%; everyone at once 19%; vulnerable populations 18%	GeoPoll (n=3,000, November 2020) ⁸
Should the COVID-19 vaccine be paid or given free of charge?		
Cameroon	56% of respondents mentioned cost as a factor in willingness to accept a vaccine.	Dinga et al. (n=385, May-August 2020) ⁴²

Media monitoring indicated concerns about when vaccines would be available (Box 1) and the prioritisation of certain population groups including teachers.³¹ In Kenya in

December 2020, news of a young doctor dying from COVID-19 was widely circulated alongside social media comments that the government was not doing enough to vaccinate frontline healthcare workers. An article about the potential costs for Kenyans to get a dose of the AstraZeneca vaccine generated high interest in November.^{27,43} In South Africa, 4% reported concern about affordability of the vaccine, for example, two women who said they would definitely not take the vaccine stated: *“Because the vaccine might be sold I will not be able to afford it as I am currently unemployed”* and *“Because I’m hungry I won’t take medication without food.”*¹⁶ Most respondents in a Cameroon study said it should be free for everyone while some noting it should be free only to children, the elderly, people with comorbidities and healthcare workers. Social listening data of online conversations focused on the availability of COVID-19 vaccines in Africa (with most data available from South Africa) and how this compared to other continents, including whether vaccines were being distributed equitably and transparently.⁴⁴

Box 1 : Illustrative quotes on vaccine access

“When will this COVID-19 vaccine be available?” – DRC³⁰

“When will we have COVID-19 vaccine?” Rwanda²⁹

“How long before Kenyans get access to the vaccine?” Kenya.²⁷

“I fail to understand why government becomes so defensive when we ask valid questions. Like, why on earth the vaccine is only coming in the second quarter 2021? Just answer and help us understand what’s changed and why nothing more can be done to get it sooner? Gosh!”³¹

“Just to let you know...our political leadership are hoarding the vaccines for themselves, it's for their loved ones, families and mistresses. Another scandal loading...” Kenya.⁴⁶

‘I and my family will not be taking the Pfizer Vaccine or the Oxford Vaccine. We can only compromise with the Russian Sputnik Vaccine. Cyril Ramaphosa and Zweli Mkhize can take them’. South Africa³¹

In addition to concerns about access, the data also pointed to fears of forced and mandatory vaccination. A rumour that an involuntary, government-mandated compulsory ‘death vaccine’ will be rolled out with significant harm to children was found by Internews in Mali and CAR³⁰ and echoed in other media monitoring reports and publications about forced vaccinations.²⁵ This contributed to fear, distrust and conspiratorial ideas. Media monitoring in Senegal noted that some believed vaccine stocks were being kept in the airport for forced vaccination by Europeans.⁹ In the IPSOS survey in January 2021 in South Africa, 47% of respondents reported supporting making COVID-19 vaccination mandatory for anyone over the age of 18, while 50% opposed the statement and 4% were not decided.³⁴

6. PERCEPTIONS OF GEOPOLITICS AND VACCINE NATIONALISM FUELLED CONCERNS

The community access debate is interconnected with broader geopolitics and vaccine nationalism that have an influence on local narratives about the intention of vaccination as well as delivery and safety. The majority of African countries have procured COVID-19 vaccines through the COVAX initiative, by February 2021, WHO had only approved European and American companies for the initiative. However many countries, including Guinea, Mozambique, Zimbabwe and Senegal, had also procured the Russian Sputnik V and Chinese Sinopharm vaccines.⁶ Some interpreted the non-inclusion of Russian and Chinese vaccines from COVAX as the effect of collusion between WHO and Western companies seeking profits, although the non-inclusion was due to those vaccines having not yet fulfilled the quality criteria to be included in COVAX³⁸ COVID-19 vaccines have become associated with Europe and North America, raising suspicions of neo-colonialism through medical research and “suspicious intentions” in supplying vaccines to Africa.³⁸ On the other hand, people were also concerned about the economic impact of any delays in the vaccine rollout and why authorities were not negotiating with Chinese and Russian vaccine manufacturers to address access gaps.^{22,31} Monthly media analyses and online trends reported by UNICEF (November 2020 to February 2021) noted specific concerns about management of supply, for example, users stated that the vaccine would not be accessible in the region due to lack of funds, incompetence or corruption, people were also concerned about the lack of transparency.^{27,31,33,45}

There were numerous examples of concern. That the vaccines were produced outside of Africa and governments were slow in negotiating was a notable theme: *“Kenya like many African countries is DEAD SILENT on when the COVID-19 vaccine will commence. The rich North, the Middle East and most of Asia will start in Mid-December. Kenya and Africa are waiting for Jack Ma, Bill Gates et al. to help”*²⁷ In South Africa, a peak of engagement about access was found after President Ramaphosa called for all countries to access the COVID-19 vaccine.²⁷ In Cameroon some participants were confused why vaccines outside the COVAX initiative were being sent to Africa: One participant replied *“why would they label drugs and vaccines for human use as “Not for use in USA and EU?”* another wondered if, *“the vaccine sent to Africa will be of poor standards.”*⁴² The Africa CDC study, stated that 31% of participants said that the type of vaccine would have an impact on uptake and 33% that the country of manufacture would have an impact on their willingness to be vaccinated.⁴ As noted by Desclaux, *“international solidarity for an equitable COVID-19 vaccine is also not very visible in Africa which may led to people rejecting the vaccine as part of a broader identity politics”*.³⁸ Former Liberian President Ellen Johnson Sirleaf, stated on Twitter: *“It is concerning to consider how unequal #COVID-19 vaccine distribution could increase inequality between countries. Global leaders must recognise that vaccines are a global good, and must act now to ensure equal access for people in ALL countries”* (February 2021).⁴⁷ Talkwalker media monitoring

sentiment analysis from UNICEF found that an increase in negative conversations in December 2020 were mainly driven by articles and posts related to the fire at the Serum Institute in India and concerns about vaccine supplies.^{27,31,33} The vaccine 'race' remains confusing for many people, and appears to be reinforcing the idea that there are powerful hidden actors working behind the scenes to influence events, for example, the common perception that COVID-19 is a planned event by China and/or US.⁴

7. MULTIPLE RUMOURS, CONSPIRACY THEORIES AND MISINFORMATION HAVE BEEN CIRCULATING

Internews found that in Mali, Sudan and the Central African Republic the topic of vaccines was the largest thematic area of concern in their December 2020 rumour monitoring.³⁰ Alternative narratives about the pandemic and the vaccines were numerous, complex and varied, linked to different power theories. An analysis in Senegal differentiated between national, regional and global rumours and conspiracies, with different nodes of influence.³⁸ At the national scale, there were media reports of false vaccinators, a secret agreement between Bill Gates and Macky Sall (Senegalese president) for a vaccine trial, and Europeans spreading the virus through vaccination. Regional scale rumours, such as those spread by the Senegalese diaspora, included the claim that shipments of vaccines were going to be used to kill Africans, that the vaccines had harmed children in Benin and that Chloroquine could be used to treat of COVID-19. Global conspiratorial ideas identified by the study included the idea that COVID-19 is a pretext for mass population control and that the vaccine will inject chips or nanoparticles that will be activated by 5G and/or the vaccine is a biological weapon developed to cause infertility in poor countries.⁹ Notably the impact of misinformation on behaviours still appeared limited in the Africa CDC study (Table 9), where the majority of those who believed in a conspiracy theory would still take a COVID-19 vaccine (the evaluation of whether stories were accurate was made by respondents).

Anthropological research in West Africa noted the absence of communication on the vaccines by national health authorities and social dialogue on response strategies, which was facilitating beliefs in alternative ways to overcome COVID-19, or misunderstandings about vaccines. For example, community members maintained a favourable view of Chloroquine, an inexpensive and widely available drug. International therapeutic trials have shown it is not an effective COVID-19 treatment but it is considered by some to be "the African remedy that protects Africa against COVID", linking it with notions of sovereignty.³⁸ In Uganda, many who reported to be hesitant wanted to see people who have been ill with COVID-19 being "healed" by the vaccine before they would accept it.⁴ Kasozi et al. found a preference in Uganda for herbal treatments and therapeutics, which were also being promoted by the Ministry of Health.²² The role of herbal treatments was also noted in Cameroon by Dinga et al., "*I've seen on TV that Africans don't need a COVID-19 vaccine since there are herbal cures for the disease*".⁴²

Table 9: Rumours and beliefs about COVID-19

66% exposed to at least some rumours about COVID-19 that seemed untrue to them 42% reporting being exposed to a lot of rumours (52% of men vs 44% of women).	Africa CDC (n=15,000, September-December 2020) ⁴
Ethiopia 48% exposure to rumours (with high vaccine acceptance) Senegal 88% exposure to rumours (with the lowest vaccine acceptance)	
43% believed that people in Africa are being used as guinea pigs in vaccine trials, 25% believed that COVID-19 was linked to 5G (50% in South Africa) 50% believed COVID-19 was a “planned event.”	
75% of those who believed in some form of COVID-19 conspiracy would take a new COVID vaccine 23% of those who believed in some form of COVID-19 conspiracy would not 2% did not know) 83% reported to not believe in any conspiracy	

The idea that COVID-19 vaccines are a tool for population and political control or profit-making build on long-standing popular ideas of elite power. Such narratives often mention a specific authority or entity (e.g. national government, World Health Organization, big pharma), or individual (e.g. George Soros, Bill Gates) as trying to gain from the vaccine.²⁷ An important aspect of this has to do with the mRNA-based technology used in some COVID-19 vaccines, linked to theories about the intention of the “Great Reset” and the coming Fourth Industrial Revolution. Various narratives intersect about efforts to use the vaccines to implant tracking devices or inject substances to gather data and restrict civil liberties.²⁷ For example, UNICEF ESARO C4D Digital and social media monitoring on immunisation from December 2020 found that the most frequently shared web links in the region were related to COVID-19 vaccines, with the top shared article referring to a conspiracy that the vaccine will alter human DNA entitled: ‘Bill Gates Admits COVID Vaccine Changes DNA, Now Doctors Rebel!’ - this generates hostility and resistance to COVID-19 vaccines: *“I will not take your COVID vaccine. I will not download your app. I will not comply with your campaign of fear and totalitarianism. I will resist it in every facet or form that is available to me. I am not afraid of you, or your bogeyman virus. And I will live without a mask.”*³¹ As noted by respondents who were likely to refuse a vaccine in South Africa: *“The vaccine might just be a way of the government keeping track of us”* and *“This virus was man made to kill what makes you think the vaccine is safe this is a plot by a few assholes who are trying to control the world.”*¹⁶

These ideas also related to long-standing narratives of Africa being a “testing ground” for pharmaceutical drugs and agents, where Africans are viewed as “guinea pigs” for trials planned by outsiders. These ideas accuse national authorities of collaborating with companies and global power-players as a form of “coronabusiness.”³⁸ Such views are reinforced by specific statements, such as a declaration in the media by a French researcher on a COVID-19 vaccine trial on this continent, which was condemned by the Africa CDC in April as *“racist and condescending comments”*.⁴⁸ A media survey of French

and Wolof language online vaccine articles³⁷ found widely circulating information about the low-quality of vaccines that emphasised difficulties, and reproduced the stereotype of Africans as "guinea pigs." This reinforces the narrative that vaccines are not needed and are being imposed on African populations in the interest of the global north: *"It's like the vaccine specifically made for Africa may be deadlier than the covid itself."* —Facebook, January 2021 Ghana.⁴⁹ There were also concerns and suspicions voiced about the intention of mass vaccination: *"COVID-19 already has a cure but the government wants to sell vaccines"* (Mozambique)²⁹ and in Mali a belief that COVID-19 is serving the interest of the humanitarian actors and government as it brings funding from international donors: *"That vaccine, is Bill Gates vaccine"* (South Africa).³⁰ In a survey in South Africa (n=10,618, Jan 2021) 4% of respondents linked the vaccine to supernatural phenomena: *"People say it is infused with 666"* and *"Am Christian, the vaccine comes from the devil."*¹⁶ This may have been related to comments made by Chief Justice Mogoeng calling the COVID-19 vaccine *"the vaccine of the devil"*, with searches rising on Google for "luciferin" and "luciferase", claimed to be one of the vaccine components that could alter human DNA in December.³¹

8. THE DEGREE OF COMMUNITY INVOLVEMENT AND SOCIAL NORMS INFLUENCED VACCINE ACCEPTANCE

The media landscape and community engagement efforts are complex but in general have started quite late or appear limited in their effectiveness. A media survey of French and Wolof online articles (Feb-Oct 2020) in Senegal found a lack of local and African-based information monitoring, limited fact-checking efforts and a lack of circulating scientific information.⁹ This mediascape combined traditional media, online media, interacting media and social networks, with vaccine information dominated by information that combined factual and false statements, provided interpretations taken out of context and sensationalist headlines. People's inability to adequately assess the information ecosystem generated confusion: *"Heard so many rumors about it, there is so much fake news, so much weird information going around, so I won't."* and, *"People now say the COVID vaccine is no good, but if it changes, we will see. If it's good, we'll use it."*⁹

Data suggested online information trends with both positive and negative trends regarding vaccines, although data were somewhat limited. Gbashi et al. found that most Google news (569) and Twitter posts (637) between February and May 2020 were generally passive to positive towards COVID-19 vaccines in Africa.⁵⁰ In contrast, in November and December, Talkwalker media monitoring sentiment analysis from UNICEF found that less than 10% of online posts displayed positive sentiment in 2020.^{27,31} Dereje et al. in Ethiopia (n= 422) found higher vaccine refusal among participants that primarily receive information from social media (internet) as compared to TV/radio.¹³ However respondents in the Africa CDC survey who demonstrated vaccine hesitancy and higher susceptibility to seeing and believing disinformation appeared to be only slightly

more inclined to consult online sources; data from Côte D'Ivoire found that social media was linked to higher willingness to take a COVID-19 vaccine.⁴

There were important gaps in information identified at community level with many people who are vaccine hesitant asking for more information. The Africa CDC survey⁴ found that over half of respondents considered themselves either not very well or not at all informed about vaccine development.⁴ In the PERC survey, 32% of those hesitant to a COVID-19 vaccine felt they did not have enough information to make a decision (increasing to half in Senegal and Ghana).⁶ In South Africa, it was more likely for those who reported to “not know” if they would accept a COVID-19 vaccine to report a need for more information (18%) than for those who reported they would accept a vaccine (2%): *“I have no idea what a vaccine is”* and *“I need more information about the vaccine first.”*¹⁶

Efforts began in many African countries in March 2021 to build public trust in COVID-19 vaccination campaigns. Ghana was the first country to receive a COVAX delivery in late February and launched its vaccination campaign by vaccinating the president and other high ranking officials.⁴⁹ Other countries have followed this model. The mediatisation of health authorities' and sometimes presidents' immunisation, observed in most countries, certainly influenced population uptake. Vaccine acceptance is also determined by social networks and perceived social norms. In surveys in Tanzania and Kenya (Dec 2020), participants were 13 and 4.6 times more likely to accept a COVID-19 vaccine if they believed their family and friends would and 10 and 3.8 times if they believed their community and religious leaders wanted them to be vaccinated.²¹ Internews reported working with humanitarian partners on their efforts to work with vulnerable communities and IDPs in Mali using listening and discussion sessions, radio broadcasts and workshops to understand specific concerns, answer questions and encourage people to return to health centres and continue with routine vaccinations.^{51,52} Research in French West Africa found that many people were unhappy with the fact that community organisations and other stakeholders were not involved in the response to COVID at national and global levels (unlike in the HIV/AIDS response, for example) and attributed this as one of the causes of popular mistrust of health authorities negotiating vaccines.³⁸ As a religious leader in Senegal was reported to say: *“It was with a feeling of immense joy that we welcomed the vaccine. We are fully confident about it, knowing it won't kill us.”* (Feb 2021).⁴¹

9. TRUST IN AUTHORITIES AND MEDICAL INSTITUTIONS INFLUENCED VACCINE ACCEPTANCE

Trust in the authorities, including medical institutions were seen in several studies as an indicator for vaccine acceptance and confidence in vaccine safety. Notions of trust in authorities and how this influence attitudes are complex, the nuance of which can only be identified from the qualitative data. Based on data from West Africa, Desclaux found

that the unequal and monopolistic nature of the global pharmaceutical market (vaccines included), mistrust and politicisation from the COVID-19 response and the lack of communication and scientifically accurate information about the vaccine undermine population trust in COVID-19 vaccine.³⁸ For example, a high-ranking official publicly taking a vaccine may have a positive impact on vaccine acceptance, not because of trust but because of the belief that authority figures would be acting in their self-interest by getting vaccinated.

In the Africa CDC survey, those with more trust and positive attitudes towards healthcare bodies and other authorities reported higher acceptance towards vaccinations in general and a COVID-19 vaccine.⁴ The GeoPoll study found that those who were less confident regarding their government’s information also reported lower levels of agreement with vaccine safety and willingness to receive a COVID-19 vaccine.⁸ In a survey in South Africa, those who would definitely or probably take the vaccine provided positive statements such as: *“I trust the medical profession”* and *“I trust our government”* while those who would not take the vaccine or were unsure voiced mistrust of authorities as the reason they would refuse a vaccine: *“because I don’t trust the system.”*¹⁶ In Cameroon, Internews found similar feedback through social media: *“Our reluctance about the future vaccine is because we don’t trust the government.”* – Cameroon, Social Media, 13 December 2020.³⁰

Healthcare professionals and medical institutions including the WHO were seen to have an important role to play in vaccination communication and engagement in multiple studies (Table 10) while foreign governments and companies were found to be less trusted. Among the countries most likely to trust the WHO, in the Africa CDC survey, for assuring the safety and effectiveness were Ethiopia (76%) and Uganda (64%) while Niger reported the least trust in WHO (29%). Smaller-scale studies in Uganda²² and Cameroon⁴² highlighted the importance of involving African scientists in vaccine clinical trials, with most participants from Cameroon suggesting that Cameroonian scientists should be involved in vaccine development to increase community acceptance: *“why not develop our own capacity to develop and produce a COVID-19 vaccine?”*⁴²

Table 10: Trust in authorities

14 countries in Africa	Overall a high level of trust in hospitals or health care centres and Ministry of Health (85%).	PERC (n=21,774, February 2021) ⁶
15 countries in Africa	Respondents would trust the vaccine if it were approved by: World Health Organization (WHO) 59% by government healthcare workers 38% by host governments 30% Western governments 7%	Africa CDC (n=15,000, September-December 2020) ⁴
Nigeria	66.5% (n=309/465) indicated that they have no confidence in the Nigeria Centre for Disease Control (NCDC) to coordinate and implement a COVID-19 vaccine trial successfully 1.2% were very confident.	Enitan et al. (n=465, May 2020) ²⁵

There also appeared to be some relationship between people's overall trust in government as well as their satisfaction with the government response to COVID-19 and vaccine acceptance, although the data is not clear and limited. The PERC data found that overall the satisfaction with the government response to the pandemic was 74% among all countries surveyed. The highest and lowest reports of satisfaction with government response were in countries with highest and lowest vaccine acceptance respectively, however, this was not consistent among other rates⁶– see additional data in Table 11. Other data, however, suggest a much lower overall approval rating, especially regarding the unintended consequences of lockdown policies. As noted in social media: *"In Nigeria, we can't go to school because of govt. We won't get COVID vaccine because of govt. We can't travel on most roads because of govt. Now we can't even protest because of this same govt."*⁵³. Internews also reported concerns about the slow government response and fears of the vaccine circulating in the black market, for instance in Sudan: *"I expect the emergence of a black market for corona vaccines in Sudan before the government responds..."* (Twitter)⁴⁰ In the UJ-HSRC study in South Africa, the biggest single 'indicator' for vaccine acceptance was the political view of respondents: political party support, evaluation of government performance, and willingness to sacrifice for the common good; vaccine acceptance was lowest amongst those who said they would not vote.¹⁶ This suggests that political disillusionment plays a role in vaccine acceptance. Those who expressed a willingness to sacrifice certain human rights to stop the spread of the virus were far more favourable towards vaccination than those opposed to sacrificing rights (73% versus 40%).¹⁶

Political trust in vaccines may also be linked with colonial experiences, although it should be noted that present discourses and interpretation of history may be more influential than actual exposure to colonialism. Lowes and Montero found that greater exposure to French colonial government medical campaigns is associated with lower contemporary vaccination rates for children.⁵⁴ There were similar perceptions relating to the pharmaceutical industry. In Cameroon, Dinga et al. (n=385, May-August 2020) found that concerns about conflicts of interests and ethical conduct by the pharmaceutical industry was raised mostly by COVID-19 vaccine hesitant individuals. Concerns included suspicion about profit making, regulatory oversight, ethical procedures, suboptimal quality and general mistrust of the motives for pharmaceutical industries, especially those in the Western countries and in China.⁴²

Table 11: The influence of trust and political views on vaccine acceptance

Levels of government satisfaction (by region)	Western Africa (Ghana, Nigeria, Liberia, Guinea Conakry, Senegal, Côte d'Ivoire) 78% Southern Africa (Mozambique, South Africa, Zambia, Zimbabwe) 76% Eastern Africa (Ethiopia, Kenya, Uganda, Sudan) 70% Central Africa (Cameroon, Democratic Republic of Congo) 69%	PERC (n=21,774, February 2021) ⁶
Levels of government satisfaction (by country)	Sudan 54% Cameroon 59%, also had the lowest vaccine acceptance rate Guinea 91% also had the highest acceptance rate Mozambique 85%	PERC (n=21,774, February 2021) ⁶
South African participants who would accept the vaccine	73% who thought the president was doing a “good job” would accept the vaccine 36% who thought the president was not doing a “good job” would accept the vaccine	Runciman et al. (n=10,618, January 2021) ¹⁶
South African participants who had favourable view of vaccination (South Africa)	73% rated the national government’s COVID response positively 45% rated the national government’s COVID response poorly	Runciman et al. (n=10,618, January 2021) ¹⁶

10. COVID-19 HAS HAD A NEGATIVE IMPACT ON ROUTINE IMMUNISATION

Studies have revealed that pandemic-related disruptions to health services, including routine immunisations, are likely to lead to an increase in under-five childhood mortality and maternal deaths in Africa. This included study findings that most African countries reported disruptions in vaccine delivery and/or demand in May-June 2020, experienced lower immunisation coverage in 2020,⁵⁵ and that child vaccinations had the largest declines of any health service in 2020 (Table 12). Risk-benefit analysis has shown that COVID-19 deaths attributable to SARS-CoV-2 infections acquired during routine vaccination clinic visits is negligible in comparison to deaths attributed to vaccine-preventable diseases. One model projects a 45% increase in under-five childhood deaths and a 39% increase in maternal death per month if coverage of basic life-saving interventions are extensively disrupted.⁵⁶

COVID-19 has meant that vaccination programmes have had to adapt to challenges with access; providers’ and community concerns; sanitation, IPC and distancing requirements; and, alternative delivery mechanisms such as reassigning vaccinations sites e.g., to a local football stadium.⁵⁹ Numerous studies also showed that COVID-19 restrictions and community perceptions of contagion have had a negative impact on routine immunisation access.

Community feedback revealed questions about whether other vaccines prevent COVID-19 and concerns that other vaccines may spread COVID-19, for example: “*Can we say that if we are vaccinated against Ebola, we are also vaccinated against COVID because they have the same symptoms.*” (DRC, collected by CARE).²⁹

Table 12: Studies demonstrating a negative impact of COVID-19 on immunisation programmes

Immunisation Pulse Poll	29 of 34 African countries reported disruption in vaccine delivery and/or demand	UNICEF C4D (May 2020) ⁵⁷
Review of routine immunisation data	13 of 15 surveyed African countries experienced lower immunisation coverage in 2020, 6 countries showed >10% reduction in DPT3 coverage: Angola (12%), Gabon (28%), Guinea (52%), Nigeria (12%), Burundi (12%) and Senegal (14%)	Masresha et al, (January to June 2020) ⁵⁵
Analysis of Facility-Reported Service Volumes in Eight Sub-Saharan African Countries	Cameroon, Democratic Republic of Congo, Liberia, Malawi, Mali, Nigeria, Sierra Leone, and Somalia all experienced service disruptions for at least one month.	Shapira et al. (January 2018 to February 2020) ⁵⁸
Review of members of the International Immunising Pregnant Women and Infants Network (IMPRINT)	50% or more reported issues with vaccine delivery within their country.	Saso et al. (IMPRINT global network, April 2020) ⁵⁹

Discourses around other vaccines were often tied to COVID-19³¹ - for example, beliefs that COVID-19 has an animal reservoir that make it impossible to eliminate unlike some other viruses that have been successfully controlled through vaccines; concerns about COVID-19 vaccines increasing the risk of other diseases like HIV; and concerns about why with rapid development of COVID-19 vaccines, there is still no HIV vaccine: “*Maybe if HIV had ravaged the West the same way COVID-19 did, they would have also found a vaccine in 10 months but here we are 40 years later and still no vaccine.*”³¹ According to people working with IDPs in Mali, rumours were circulating that COVID-19 vaccinations will be used to harm children has led to hesitancy from parents in IDP camps to send their children to new-born vaccination centres in Mali.³⁰ News of vaccine-derived polio cases in South Sudan, Mali and Niger have triggered old conspiracies that the adverse effects are part of a plan to depopulate certain regions and the polio vaccine in Cameroon (where there is an epidemic due to a vaccine viral strain) has fostered mistrust that extends from the polio vaccine to COVID-19 vaccines.^{27,31}

Some data also suggests that COVID-19 may have increased confidence in vaccination for some people. In Sudan, Africa CDC survey reports higher confidence in vaccination because of COVID-19.⁴ A post by UNICEF Uganda to encourage routine immunisation during the pandemic received over 18,000 engagements on social media in November 2020.²⁷ The success of routine vaccine programmes (polio certification) were used as encouragement to accept COVID-19 vaccines²⁷ and stressed the public health benefits of immunisation programmes.³¹

FURTHER RESOURCES

WHO. [Data for action: achieving high uptake of COVID-19 vaccines](#). Interim guidance, 2020

Africa CDC & AU (January 2021) Virtual Meeting on the African Covid-19 Vaccine Financing and Deployment Strategy Access [here](#).

Africa CDC (2021) Guidance on Emergency Expedited Regulatory Authorisation and Access to COVID-19 Vaccines in Africa. Access [here](#).

Africa CDC weekly updates on genomic [sequencing](#)

AU; WHO; Africa CDC (2021) COVID-19 Scientific and Public Health Policy Update- 3 March. Access [here](#).

RCCE Collective Service, [behavioural indicators](#)

ACKNOWLEDGEMENTS

This synthesis was requested by the RCCE Collective Service Sub-TWG on Community Feedback and the East and Southern Africa Sub-Region Covid-19 Vaccine Readiness and Delivery Working Group (ESACRED-TWG). We thank Helena Ballester Bon (UNICEF, ESARO), Nina Gobat (WHO), Alice Desclaux (Institut de recherche pour le développement), Colby Wilkason (Resolve to Save Lives) and Eva Niederberger (Anthrologica) for their reviews and Lisa Menning (WHO) for expert advice. Coordination support was provided by the RCCE Collective Service (Global, ESAR and WCAR).

CONTACT

If you have a direct request concerning the response to COVID-19, regarding a brief, tools, additional technical expertise or remote analysis, or should you like to be considered for the network of advisers, please contact the Social Science in Humanitarian Action Platform by emailing Annie Lowden (a.lowden@ids.ac.uk) or (oliviattulloch@anthrologica.com). Key Platform liaison points include: UNICEF (nnaqvi@unicef.org); IFRC (ombretta.baggio@ifrc.org); and GOARN Research Social Science Group (nina.gobat@phc.ox.ac.uk).



The Social Science in Humanitarian Action is a partnership between the Institute of Development Studies, Anthrologica and the London School of Hygiene and Tropical Medicine. This work was supported by the UK Foreign, Commonwealth and Development Office and Wellcome Grant Number 219169/Z/19/Z. The opinions expressed are those of the authors and do not necessarily reflect the views or policies of IDS, Anthrologica, LSHTM, Wellcome Trust or the UK government.

Suggested citation: Tulloch O, Roldan de Jong T, Bardosh K, (2021) Data synthesis: COVID-19 vaccine perceptions in Africa. Social and behavioural science data. March 2020-March 2021. Brighton: Social Science in Humanitarian Action (SSHAP) DOI:[10.19088/SSHAP.2021.028](https://doi.org/10.19088/SSHAP.2021.028)

Published [May 2021]

© Institute of Development Studies 2021



This is an Open Access paper distributed under the terms of the Creative Commons Attribution 4.0 International licence (CC BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original authors and source are credited and any modifications or adaptations are indicated. <http://creativecommons.org/licenses/by/4.0/legalcode>

If you have a direct request concerning the response to COVID-19, regarding a brief, tools, additional technical expertise or remote analysis, or should you like to be considered for the network of advisers, please contact the Social Science in Humanitarian Action Platform by emailing Annie Lowden (a.lowden@ids.ac.uk) or Olivia Tulloch (oliviattulloch@anthrologica.com). Key Platform liaison points include: UNICEF (nnaqvi@unicef.org); IFRC (ombretta.baggio@ifrc.org); and GOARN Research Social Science Group (nina.gobat@phc.ox.ac.uk).

DATA SOURCES

Table 13: Summary of data sources.

Published by	Method	Timeframe	Countries included in this synthesis
Africa CDC COVID 19 Vaccine Perceptions: A 15 country study	F2F and Telephone surveys (n=15,000)	Sept-Dec 2020	15 African countries: Burkina Faso (n=1037); Côte D'Ivoire (n=1039); DRC (n=1007); Ethiopia (n=1001); Gabon (n=1112); Kenya (n=1000); Mali (n=1009); Nigeria (n=1172); Niger (n=1173); Senegal (n=1010); South Africa (n=1056); Sudan (n=1075); Uganda (n=1008).
AIRA- CORAF Project (Coronavirus Anthropology Africa)	Telephone interviews with 50-60 people in each country (n=215)	Oct 2020	Senegal, Burkina Faso, Benin, Cameroon
AIRA - COVID-19 Infodemic Trends in the African Region	NewsWhip Analytics; TweetDeck, and UNICEF dashboards	March 2021	AFRO/ DRC, Senegal, Gabon, Mauritania
Community Feedback Risk Communication and Community Engagement ESAR (RCCE) interagency sub-working group	Priorities shared by partners: Centre for Behaviour Change Communication, Ground Truth Solutions, UNICEF, VSO,WHO	Jan 2020	13 countries in the East and Southern Africa region: Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, South Africa, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe
GeoPoll 2020 Year End Report	Phone, SMS survey (n=3,000)	Nov 10-24, 2020	6 African countries: Kenya (n=500), South Africa (n=500), Nigeria (n=500), Côte D'Ivoire (n=500), DRC (n=500), Mozambique (n=500).
IFRC: Community Feedback Reports	Monthly community feedback including conversations; FGD; hotlines; meetings; interactive radio shows, social media and WhatsApp	Jan 2020	7 African countries: Democratic Republic of Congo, Gabon, Malawi, Togo, Sierra Leone, Cameroon, Seychelles.
Internews (Rooted in Trust Global & Country reports)	Social media analysis, door-to-door surveys, informal meetings, and interactive media	Oct-Feb 2020	CAR, Mali and Sudan
IPSOS global report	Online survey (n=500+)	Jan 2021	South Africa (only African country included)
John Hopkins University (JHU) KAP- Dashboard	Online surveys: July, n= 44,784	July and again in Nov 2020	11 African countries: Angola (n=3945/3431); Cameroon (n=4322/3738); Côte D'Ivoire (n=3537/3171); Ghana (n=3664/3868); Kenya (n=4664/3541); Mozambique (n=4252/3936); Nigeria (n=4694/3853); Senegal

	October, n= 38,502		(n=3250/2471); South Africa (n=4094/3916); Tanzania (n=3736/3174); Uganda (4626/3403)
Maryland University & Facebook Vaccine acceptance global survey	Facebook polls (n=10,154,000)	4 April 2021	4 African countries selected: Kenya (n=4,005,000); Sudan (n=1,332,000); South Africa (n=4,817,000)
PERC Country Reports	Telephone surveys (n=21,774)	Feb 2021	16 African countries: Ethiopia (n=1483); Kenya (n=1461); Uganda (n=1246); Sudan (n=1380); Ghana (n= 1298); Nigeria (n= 1318); Liberia (n= 1313); CDI (n= 1397); Guinea (n= 1302); Senegal (n= 1353); Cameroon (n=1323); DRC (n=1316); Mozambique (n=1333); South Africa (n=1639); Zambia (n= 1328); Zimbabwe (n=1284).
UNICEF C4D: Community Rapid Assessment, surveys on immunisation demand	Random Digital Dialing using Interactive Voice Recording Survey & Face to Face interviews	May 2020	Kenya (n=1124), Madagascar (n=1841), Uganda (n=2335), South Sudan (n=4282)
UNICEF C4D	CRA (1 st round n=999; 2 nd n=987)	Dec 2020	Ethiopia
UNICEF	KAP mobile survey (n=1289)	n.d	Uganda
UNICEF ESARO C4D Section: Digital and social media monitoring on immunisation.	Analysis of search trends on digital platforms, social media conversations and popular digital news content.	Nov – Feb 2020	Eastern and Southern African countries
UNICEF ESARO: Online and Social Media monitor monthly report on COVID-19 trends and rumours in Eastern and Southern Africa.	Google/YouTube trends, social media posts, and top performing news stories on digital media,	Feb 2021	Eastern and Southern African countries
UNICEF U-Report	Online poll (n=7,739)	Jan 2021	Zambia
UNICEF U-Report	Online poll (n=52,421)	Feb 2021	Uganda
University of Johannesburg & Human Science Research Consul (UJ-HSRC): Willingness to take a Covid-19 vaccine: A research briefing	Online survey (n=10,618)	Jan 2021	South Africa
World Vision -Behavioral and Other Determinants of C-19 Vaccine Acceptance	Barrier analysis	Dec 2020	Kenya, Tanzania

Table 14: Data included from published literature

Published by	Method	Timeframe	Countries
Adebisi et al., 2020 (preprint)	Cross-sectional survey; hypothetical COVID-19 vaccine; online questionnaire (n=517 older than 15 years+)	August 2020	Nigeria
Charles et al., 2020 (preprint)	Cross-sectional study; online survey (n=256 RMNH workers)	July 2020	Lagos, Nigeria
Chawe et al., 2020 (preprint)	KAP; cross sectional study; Online questionnaire (n=208 medical laboratory professionals)	June, 2020	Zambia
Dereje et al., 2021 (preprint)	Mixed method study; F2F (n=422 quantitative & 24 qualitative interviews; adults)	January, 2021	Addis Ababa, Ethiopia
Ditekemena et al., 2021	Cross-sectional study; online survey (n=4,131 adults)	August-Sept 2020	DRC
Dinga et al., 2021	Descriptive, quantitative and qualitative analysis; online and in person questionnaire (n=385 adults)	May to August 2020	Cameroon
Echoru et al., 2020 (preprint)	Cross sectional study (invitations through emails or WhatsApp contacts); online survey (n=1,067 adults)	July to September 2020	Western Uganda
Enitan et al., 2020	Cross-sectional study; online questionnaire (n=465 adults)	May, 2020	Nigeria
Gbashi et al., 2020 (preprint)	Media analysis. Sources: Twitter and Google News (637 twitter posts and 569 Google news headlines/descriptions)	February – May 2020	Africa
Kabamba Nzaji et al., 2020	KAP; analytical cross-sectional study; paper self-administered questionnaire (n=613 HCWs)	March- April 2020	DRC
Kasozi et al., 2021	KAP/descriptive cross-sectional study; online questionnaire (n=260 HCWs)	Sept- October 2020	Uganda
Ngoyi et al., 2020	KAP; cross-sectional descriptive study; observation techniques, followed by administration of a questionnaire (n=439 students)	September 2020	DRC (Higher Institute of Medical Techniques in Lubumbashi)
Olomofe et al., 2021 (preprint)	Cross-sectional study; online questionnaire (n=776 adults)	June to July 2020	Nigeria
Saso et al., 2020	Cross-sectional survey; online survey (n=48 members of the Immunising Pregnant Women and Infants Network (IMPRINT))	April 2020	Global network

REFERENCES

1. Africa CDC & African Union. (2021). *VIRTUAL MEETING ON THE AFRICAN COVID-19 VACCINE FINANCING AND DEPLOYMENT STRATEGY* [Virtual meeting].
2. Africa CDC. (2021). *Guidance on Emergency Expedited Regulatory Authorisation and Access to COVID-19 Vaccines in Africa*. Africa Centres for Disease Control and Prevention.
3. Jerving, S. (2021, April 7). *In Brief: Only 70,000 people are fully vaccinated for COVID-19 in Africa*. Devex. <https://www.devex.com/news/sponsored/in-brief-only-70-000-people-are-fully-vaccinated-for-covid-19-in-africa-99610>
4. Africa CDC. (2021). *COVID 19 Vaccine Perceptions: A 15 country study*.
5. University of Maryland & Facebook. (2021). *International Vaccine Acceptance Dashboard*. <https://directrelief.maps.arcgis.com/apps/opsdashboard/index.html#/6962c454dbc74aa2bb7fb76bd739e418>
6. Partnership for Evidence-Based Response to COVID-19 (PERC). (n.d.). PERC country reports [Prevent Epidemics]. *Prevent Epidemics*. Retrieved 14 April 2021, from <https://preventepidemics.org/covid19/perc/>
7. Johns Hopkins Center for Communication. (2020). *KAP COVID Global View*. <https://ccp.jhu.edu/kap-covid/kap-covid-global-view-2/>
8. GeoPoll. (2020). *GeoPoll's 2020 Year End Report: Ongoing Impact of COVID-19 in 6 African Countries—GeoPoll*. <https://www.geopoll.com/blog/covid-africa-year-end-2020/>
9. Africa Infodemic Response Alliance (AIRA). (2021). *Projet Coronavirus Anthropologie Afrique (CORAF): Reticence about COVID-19 vaccine uptake: Causes, perceptions, and strategic proposal in West and Central Africa*.
10. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Cameroon R3*. Partnership for Evidence-Based Response to COVID-19.
11. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Guinea R3*. Partnership for Evidence-Based Response to COVID-19.
12. Olomofe, C. O., Soyemi, V. K., Udomah, B. F., Owolabi, A. O., Ajumuka, E. E., Igbokwe, C. M., Ashaolu, U. O., Adeyemi, A. O., Aremu-Kasumu, Y. B., Dada, O. F., Ochieze, J. C., Fayemi, O. B., Ologunde, K. W., Popoola, G. O., & Ariyo, O. E. (2021). *PREDICTORS OF UPTAKE OF A POTENTIAL COVID-19 VACCINE AMONG NIGERIAN ADULTS* [Preprint]. *Infectious Diseases (except HIV/AIDS)*. <https://doi.org/10.1101/2020.12.28.20248965>
13. Dereje, N., Tesfaye, A., Tamene, B., Alemeshet, D., Abe, H., Tesfa, N., Gedion, S., Biruk, T., & Lakew, Y. (2021). *COVID-19 Vaccine hesitancy in Addis Ababa, Ethiopia: A mixed-methods study* [Preprint]. *Public and Global Health*. <https://doi.org/10.1101/2021.02.25.21252443>
14. Ngoyi, J. M., Mbuyu, L. K., Kibwe, D. N., Kabamba, L. N., Umba, E. K., Tambwe, P. N., Musangu, M. S., Kahaki, B. I., Lubo, D. L., Tshimba, S. Y., Mukemo, A. K., Mazono, P. M., Kabamba, M. N., & Luboya, O. N. (2020). *Covid-19 vaccination acceptance among students of the Higher Institute of Medical Techniques of Lubumbashi, Democratic Republic of Congo*. 4(2), 48–52.
15. Echoru, I., Ajambo, P. D., & Bukenya, E. M. (2020). *Acceptance and Risk Perception of COVID-19 Vaccine in Uganda: A Cross Sectional Study in Western Uganda* [Preprint]. In Review. <https://doi.org/10.21203/rs.3.rs-78780/v1>
16. Runciman, C., Roberts, B., Alexander, K., Bohler-Muller, N., & Bekker, M. (2021). *UJ-HSRC COVID-19 DEMOCRACY SURVEY: Willingness to take a Covid-19 vaccine: A research briefing*. University of Johannesburg; HSRC.
17. U-Report. (2021, February 4). *U-Report Uganda*. <https://ureport.ug/opinion/4857/>
18. U-Report. (2021, January 23). *U-Report Zambia*. <https://zm.ureport.in/opinion/4860/>
19. UNICEF. (2020, December 3). *Community Rapid Assessment on COVID-19: 1st and 2nd Round Findings on Behavioral Drivers, Community Coping Mechanisms and Communication Channels in Ethiopia*.
20. Ditekemena, J. D., Nkamba, D. M., Mutwadi, A., Mavoko, H. M., Siewe Fodjo, J. N., Luhata, C., Obimpeh, M., Van Hees, S., Nachega, J. B., & Colebunders, R. (2021). *COVID-19 Vaccine Acceptance in the Democratic Republic of Congo: A Cross-Sectional Survey*. *Vaccines*, 9(2), 153. <https://doi.org/10.3390/vaccines9020153>
21. World vision. (2020). *Barrier Analysis Studies on C-19 Vaccines*.
22. Kasozi, K. I., Laudisoit, A., Osuwat, L. O., Batiha, G. E.-S., Al Omairi, N. E., Aigbogun, E., Ninsiima, H. I., Usman, I. M., DeTora, L. M., MacLeod, E. T., Nalugo, H., Crawley, F. P., Bierer, B. E., Mwandah, D. C., Kato, C. D., Kiyimba, K., Ayikobua, E. T., Lillian, L., Matama, K., ... Welburn, S. C. (2021). *A Descriptive-Multivariate Analysis of Community Knowledge, Confidence, and Trust in COVID-19 Clinical Trials among Healthcare Workers in Uganda*. *Vaccines*, 9(3), 253. <https://doi.org/10.3390/vaccines9030253>
23. Kabamba Nzaji, M., Kabamba Ngombe, L., Ngoie Mwamba, G., Banza Ndala, D. B., Mbidi Miema, J., Luhata Lungoyo, C., Lora Mwimba, B., Cikomola Mwana Bene, A., & Mukamba Musenga, E. (2020). *Acceptability of Vaccination Against COVID-19 Among*

- Healthcare Workers in the Democratic Republic of the Congo. *Pragmatic and Observational Research*, Volume 11, 103–109. <https://doi.org/10.2147/POR.S271096>
24. Chawe, A., Mfuno, R. L., Siyapila, P., Zimba, S. D., Vlahakis, P., Mwale, S., Mwape, K., Kalolekesha, M., Chileshe, M., Mutale, J., Mudenda, T., Manda, G., & Daka, V. (2020). *Knowledge, attitudes and practices of COVID 19 among Medical Laboratory Professionals in Zambia* [Preprint]. Public and Global Health. <https://doi.org/10.1101/2020.09.22.20199240>
25. Enitan, Oyekale, Akele, Olawuyi, Olabisi, Aj, N., En, A., & Cb, E. (2020). Assessment of Knowledge, Perception and Readiness of Nigerians to Participate in the COVID-19 Vaccine Trial. *International Journal of Vaccines and Immunization*, 4(1). <https://doi.org/10.16966/2470-9948.123>
26. Adebisi, Y. A., Alaran, A. J., Bolarinwa, O. A., Akande-Sholabi, W., & Lucero-Prisno, D. E. (2020). *When it is available, will we take it? Public perception of hypothetical COVID-19 vaccine in Nigeria* [Preprint]. Public and Global Health. <https://doi.org/10.1101/2020.09.24.20200436>
27. UNICEF ESARO C4D. (2020). *Digital and Social Media Monitor on Immunization in Eastern and Southern Africa. Rep Nr 1 (November 1-30, 2020)* (No. 1). UNICEF ESARO.
28. Mwananyanda, L., Gill, C. J., MacLeod, W., Kwenda, G., Pieciak, R., Mupila, Z., Lapidot, R., Mupeta, F., Forman, L., Ziko, L., Etter, L., & Thea, D. (2021). Covid-19 deaths in Africa: Prospective systematic postmortem surveillance study. *BMJ*, n334. <https://doi.org/10.1136/bmj.n334>
29. IFRC- Community Feedback SWG. (2021). *COVID-19 Community feedback Report* (No. 27).
30. Internews. (2020). *Global Rumor Bulletin* (No. 1).
31. UNICEF ESARO C4D. (2020). *Digital and Social Media Monitor on Immunization in Eastern and Southern Africa. Rep Nr 2 (December 1-31, 2020)* (No. 2). UNICEF ESARO.
32. PERC. (2021). *Finding the Balance: Public Health and Social Measures in South Africa R3*. Partnership for Evidence-Based Response to COVID-19.
33. UNICEF ESARO C4D. (2021). *Digital and Social Media Monitor on Immunization in Eastern and Southern Africa. Rep Nr 3 (January 1-31, 2021)* (No. 3). UNICEF ESARO.
34. IPSOS. (2021, February 9). *Global attitudes: COVID-19 vaccines*. Ipsos. <https://www.ipsos.com/en/global-attitudes-covid-19-vaccine-january-2021>
35. NTV Kenya. (2020, November 11). *I've got real doubts about Covid-19 vaccine, says CS Mutahi Kagwe* [YouTube]. <https://www.youtube.com/watch?v=eO1Bhj41Pis>
36. Africa Infodemic Response Alliance (AIRA). (2021). *Monitoring Report_ DRC, Senegal, Gabon, Mauritania*. https://docs.google.com/document/d/1e7eJZSsOaHgeZlZqEk9HjtHj9jV9koxSRat_QECCPA/edit?usp=embed_facebook
37. Africa Infodemic Response Alliance (AIRA). (2021). *COVID-19 Infodemic Trends in the African Region*. https://docs.google.com/document/d/1Jgb-tiL-dWT49hY17Fe9IKmAHVP1gb9gxywKfFQntBM/edit?usp=embed_facebook
38. Desclaux, A. (2020). *La mondialisation des informations et la fabrique des opinions sur les traitements du COVID en Afrique*. Africa Infodemic Response Alliance: Project CORAF.
39. Islamic Medical Association. (2021, February 12). *POSITION STATEMENT OF THE ISLAMIC MEDICAL ASSOCIATION OF SOUTH AFRICA [IMASA] – COVID-19 VACCINES – IMA SA*. <https://ima-sa.co.za/position-statement-of-the-islamic-medical-association-of-south-africa-imasa-covid-19-vaccines/>
40. Internews. (2020). *Rumor Bulletin Sudan: Community: 05 December* (No. 5).
41. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Senegal R3*. Partnership for Evidence-Based Response to COVID-19.
42. Dinga, J. N., Sinda, L. K., & Titanji, V. P. K. (2021). Assessment of Vaccine Hesitancy to a COVID-19 Vaccine in Cameroonian Adults and Its Global Implication. *Vaccines*, 9(2), 175. <https://doi.org/10.3390/vaccines9020175>
43. NationAfrica. (2020, November 24). *Kenyans to pay Sh327 to get coronavirus vaccine*. *Nation*. <https://nation.africa/kenya/news/kenyans-to-pay-sh327-to-get-coronavirus-vaccine-3208058>
44. The East African. (2020, December 14). *Rich countries roll out vaccines for their people, poor EA waits at back of the queue*. The East African. <https://www.theeastafrican.co.ke/tea/news/east-africa/rich-countries-roll-out-vaccines-for-their-people-poor-ea-waits-at-back-of-the-queue-3228072>
45. UNICEF ESARO C4D. (2021). *Digital and Social Media Monitor on Immunization in Eastern and Southern Africa*. (No. 4). UNICEF ESARO.
46. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Kenya R3*. Partnership for Evidence-Based Response to COVID-19.
47. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Liberia R3*. Partnership for Evidence-Based Response to COVID-19.

48. Africa CDC. (2020, April 9). Statement of the Africa CDC on the Potential Clinical Trial of a Tuberculosis Vaccine Protective Against COVID-19 in Africa. *Africa CDC*. <https://africacdc.org/news/statement-of-the-africa-centres-for-disease-control-and-prevention-on-the-potential-clinical-trial-of-a-tuberculosis-vaccine-protective-against-covid-19-in-africa/>
49. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Ghana R3*. Partnership for Evidence-Based Response to COVID-19.
50. Gbashi, S., Adebo, O. A., Doorsamy, W., & Njobeh, P. B. (2020). *Systematic Delineation of Media Polarity on COVID-19 Vaccines in Africa: Computational Linguistic Modeling Study (Preprint)* [Preprint]. *JMIR Medical Informatics*. <https://doi.org/10.2196/preprints.22916>
51. Internews. (2020). *Rumor Bulletin Mali: Community: 03 November* (No. 3).
52. Internews. (2021). *Rumor Bulletin Mali: Community: 05 January* (Special Edition Vaccines).
53. PERC. (2021). *Finding the Balance: Public Health and Social Measures in Nigeria R3*. Partnership for Evidence-Based Response to COVID-19.
54. Lowes, S., & Montero, E. (2020). *The Legacy of Colonial Medicine in Central Africa* [Preprint].
55. Masresha, B. G., Luce Jr, R., Shibeshi, M. E., Ntsama, B., Ndiaye, A., Chakauya, J., Poy, A., & Mihigo, R. (2020). The performance of routine immunization in selected African countries during the first six months of the COVID-19 pandemic. *Pan African Medical Journal*, *37*. <https://doi.org/10.11604/pamj.suppl.2020.37.1.26107>
56. Robertson, L. J., Maposa, I., Somaroo, H., & Johnson, O. (2020). Mental health of healthcare workers during the COVID-19 outbreak: A rapid scoping review to inform provincial guidelines in South Africa. *South African Medical Journal = Suid-Afrikaanse Tydskrif Vir Geneeskunde*, *110*(10), 1010–1019. <https://doi.org/10.7196/SAMJ.2020.v110i10.15022>
57. UNICEF ESARO C4D. (2020, December 4). *Sustaining demand and uptake of immunization services during Covid-19*. 16th Annual African Vaccinology Course.
58. Shapira, G., Ahmed, T., Drouard, S. H. P., Fernandez, P. A., Kandpal, E., Nzelu, C., Wesseh, C. S., Mohamud, N. A., Smart, F., Mwansambo, C., Baye, M. L., Diabate, M., Yuma, S., Ogunlayi, M., Rusatira, R. J. D. D., Hashemi, T., Vergeer, P., & Friedman, J. A. (2020). *Disruptions in Essential Health Services During the First Five Months of COVID-19: Analysis of Facility-Reported Service Volumes in Eight Sub-Saharan African Countries* [Preprint]. In Review. <https://www.ssrn.com/abstract=3757414>
59. Saso, A., Skirrow, H., & Kampmann, B. (2020). Impact of COVID-19 on Immunization Services for Maternal and Infant Vaccines: Results of a Survey Conducted by Imprint—The Immunising Pregnant Women and Infants Network. *Vaccines*, *8*(3), 556. <https://doi.org/10.3390/vaccines8030556>
60. Charles, A., Aduragbemi, B.-T., Mobolanle, B., Chigozie, M. C., & Bukola, A. B. (2020). *Reproductive Maternal and Newborn Health providers assessment of facility preparedness and its Determinants during the COVID-19 pandemic in Lagos, Nigeria* [Preprint].
61. Buonsenso, D., Cinicola, B., Kallon, M. N., & Iodice, F. (2020). Child Healthcare and Immunizations in Sub-Saharan Africa During the COVID-19 Pandemic. *Frontiers in Pediatrics*, *8*, 517. <https://doi.org/10.3389/fped.2020.00517>
62. UNICEF. (2020). *Community Rapid Assessment on COVID-19: Behavioural Findings and Insights from Round 1 in Kenya, Madagascar and South Sudan*. UNICEF Evaluation Office.