Assessing vaccine confidence in low-resource settings to prevent and contain the COVID-19 pandemic

Final Report

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INTRODUCTION

The COVID-19 global pandemic has caused severe social disruption and excess mortality, and it has overwhelmed most health systems and driven many countries into economic recession. It has also highlighted long-standing health inequities and low and middle-income (LMIC) countries. These countries have been more intensely affected by this pandemic, suffering deep economic consequences and intense strain on healthcare systems.

Transmission of SARS-CoV-2 can be interrupted through non-pharmaceutical interventions, like face coverings, social distance and testing. However, to control the pandemic, effective vaccines will need to be rolled out widely in local communities around the world. Vaccine program efforts can be hindered by vaccine hesitancy, which may lead to delay or refusal of COVID-19 vaccines. Despite the decades of success in vaccine programs in LMICs through multilateral vaccine projects such as Gavi, in the past few years there has been increased skepticism and concern about vaccines, impacting their acceptance and trust. This has been exacerbated by the COVID-19 pandemic that has significantly increased mis- and disinformation about vaccines, including their safety and efficacy.

To introduce COVID-19 vaccines effectively, there is a need to understand drivers of vaccine confidence in different populations. Research is necessary to understand local sentiments, beliefs and behaviors associated with immunization. This production of knowledge is necessary to develop targeted interventions and ensure global uptake of vaccination.

AIMS AND OBJECTIVES

The aim of this project was to **support the development of guidance on interventions to improve vaccine uptake in LMICs i**nformed by an assessment of local barriers and drivers to adult vaccine uptake. Specific objectives were to:

1. Identify **local barriers and drivers to vaccine uptake** across selected LMICs
2. Develop a **framework to categorize barriers and drivers** of vaccination uptake
3. Provide insights to inform **interventions and programs to facilitate vaccine uptake** in LMICs

METHODS

Study design

The Vaccine Confidence Project (VCP) worked towards achieving the aims and objectives of this project through three separate phases linked to the three study objectives.

Successful interventions to improve vaccine uptake need to be context-specific and address the key barriers and drivers of vaccination uptake in specific populations. We started this project with **an assessment and identification of the local barriers and drivers to vaccination uptake** across countries in Africa. The identification of local barriers and drivers of vaccination in these countries informed the development of a **framework to categorize barriers and drivers of vaccination uptake**.

In a second phase, we provided insights to support the conception and development of **interventions and programs to facilitate vaccine uptake in LMICs**.

Finally, we developed a **toolbox of interventions to address some of the local barriers and drivers to vaccination uptake** identified in phase 1.

Methodologies for each phases are described in more details in the next pages.

Phases of the project

1
Local barriers and drivers to vaccine uptake across selected African countries
05/21-07/21

2
Insights to inform interventions and programs to facilitate vaccine uptake in LMICs
09/21-11/21

3
Toolbox of interventions to address local barriers and drivers to vaccination uptake in LMICs
12/21-03/22
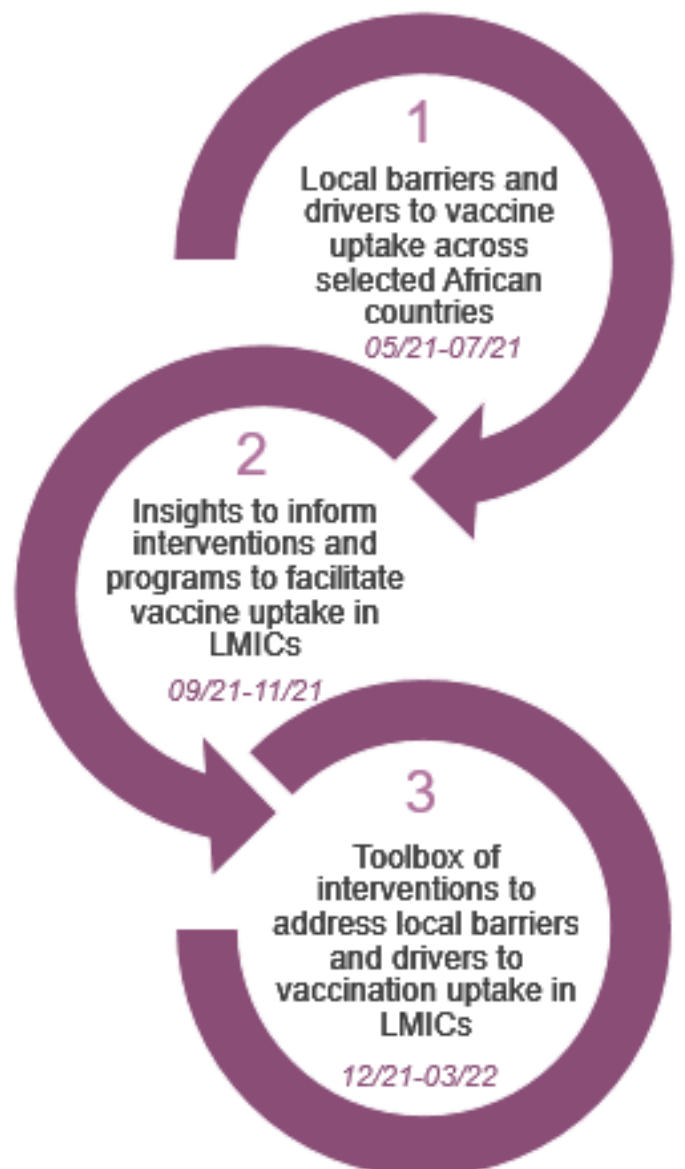
PHASE 1: Local barriers and drivers to vaccine uptake across African countries

Through thematic analyses, identify themes that emerge organically from the data

⬇

Develop a codebook with the themes that emerged and use this for data extraction

⬇

Understand roots for concerns of vaccines at a local level, mapping rumours and misinformation.

⬇

Provide insights stemming from VCP team expertise to complement the data analysis

To identify local barriers and drivers to vaccine uptake, the VCP conducted a review of existing VCP data on vaccine confidence and uptake in a selection of African countries, combined with a few external sources with relevant data (from 2015 to May 2021).

A thematic analysis and grounded theory approach was used to analyse findings with the aim of identifying emerging themes. Data was coded and extracted using a codebook designed based on a preliminary analysis of emerging themes. Parent codes included: role of governments, role of health institutions, role of HCPs, vaccine safety, vaccine effectiveness, mistrust of vaccine, vaccine compatibility with religious beliefs, vaccine importance, alternative medicine, pandemic, overall confidence and willingness, demographics, emotions, trusted sources of information, misinformation, mistrust of trials, mistrust of western powers, interventions (ethical challenges; community engagement; rumour management; trust building; mobile training and support), rumours, roots of mistrust, social media, and information.

The final data extraction sheet was used to explore roots for concerns of vaccines at a local level, map rumours and misinformation. Additionally, insights stemming from the VCP team expertise was used to complement the data analysis and provide recommendations.
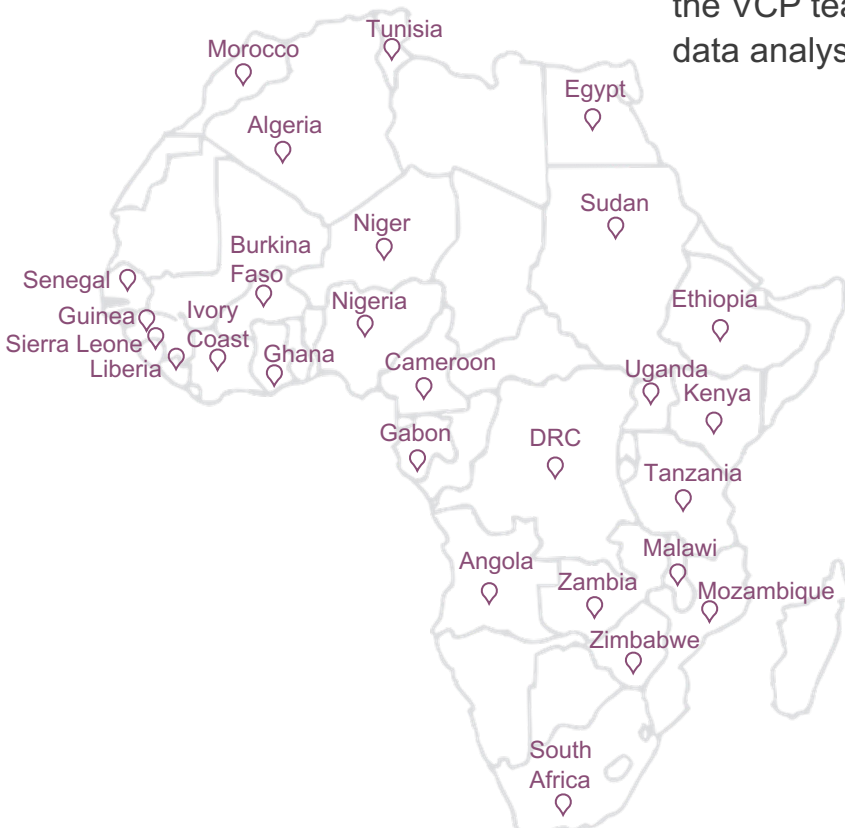
Countries from which local barriers and drivers to vaccine uptake were identified

List of sources used for phase 1

VCP/Janssen project on COVID-19: survey results
Dates: Wave 1: June 2020, Wave 2: October – November 2020
Scope: Quantitative survey conducted with adults in a range of countries (including Ethiopia, Nigeria and DRC in Africa) around their willingness to receive a COVID-19 vaccine. Determinants of vaccine acceptance are also explore (e.g. socio-demographic status, emotional status, confidence in the importance, effectiveness and safety of vaccines) are also explored, together with participants' confidence in vaccines in general.
Sources included for analysis: internal reports, presentations and a manuscript for peer-reviewed publication (not yet submitted)

VCP/Janssen project on COVID-19: social media results
Dates: December 2019 – September 2020 (*currently waiting for second round of analysis*)
Scope: Social media listening to investigate public sentiments and emotions around current and potential measures to contain and treat COVID-19, in order to and gain an understanding of the factors that would influence public confidence in and acceptance of future treatment and prevention options.
Sources included for analysis: internal reports

COVID-19 survey from Africa CDC/VCP
Dates: July-December 2020
Scope: Surveys conducted by Africa CDC and the VCP to explore experiences and perceptions of COVID-19, awareness and attitudes relating to a potential COVID-19 vaccine, media use and misinformation, and the impact of the ongoing pandemic on overall vaccine confidence.
Sources included for analysis: Internal report and presentation of findings

Vaccine Confidence Index surveys
Dates: 2015-2019
Scope: Global studies using the Vaccine Confidence Index to measure adults' confidence in the importance, safety, effectiveness and religious compatibility of vaccination globally.
Sources included for analysis: Peer-reviewed publications in scientific journal (including the most recent Lancet article), internal reports and presentations

Study on monitoring, detecting and triaging rumours around vaccine trials on social and digital media (MRC/VCP study)
Dates: September 2019-April 2020
Scope: We conducted social and digital media monitoring of conversations around vaccine trials around the world, including in Africa. We developed a framework to categorise the risks of rumours that were identified through media monitoring and alert vaccine trial managers of possible disruptions to their trials.
Sources included for analysis: internal report

Janssen/VCP EBODAC project
Dates: 2016-2018
Scope: Findings from the EBODAC project in relation to Ebola vaccine trials conducted in various African settings. These include assessment of rumours and barriers to vaccination and participation in vaccine trials as well as interventions to improve acceptance of interventions such as community engagement.
Sources included for analysis: internal reports and publications in peer-reviewed journal articles

John Hopkins COVID-19 vaccine acceptance data (external data)
Dates: Ongoing (continuous updates)
Scope: Trends and country comparisons on COVID-19 vaccine acceptance, including analysis of demographic differences and key influencers
Sources included for analysis: online database

PERC COVID-19 Decision support dashboard (external data)
Dates: Ongoing (continuous updates)
Scope: Trends and country comparisons on COVID-19 risk perception and information, confidence and trust sources, willingness and confidence in vaccination
Sources included for analysis: online database

Collective Service COVID-19 behavioural indicators (external data)
Dates: March-May2021
Scope: Trends and country comparisons on COVID-19 behavioural indicators such as community engagement, trust, vaccine acceptance, risk perception...
Sources included for analysis: online database

PHASE 2: Insights to inform interventions and programs to facilitate vaccine uptake in LMICs

A literature review was conducted as part of Phase 2 to provide an overview of interventions used to improve adult vaccination uptake in Africa. The specific objectives of the review were to **1- determine what interventions exist** and **2- determine the effectiveness of different interventions.**

The Medline and Embase databases were searched to identify peer-reviewed published in the past 10 years (Jan 2011 – Oct 2021) in English and French. Additionally, a grey literature was conducted by searching websites and resources from WHO, Africa CDC, UNICEF, and the Communications Initative. The following search strategy was used to search the databases:

List of keywords

Due to the low number of studies published from African countries, the search was extended to low- and middle-income countries, with a special focus on India, Pakistan, Nepal, and Bangladesh

First search
(((vaccin* or immunis* or immuniz*) AND (uptake or adher* or accept* or intent* or willingness or coverage)) AND (adult* OR Ebola OR covid* or corona* or SARS-CoV* or flu or influenza or Tdap or pertussis or "whooping cough" or tetanus or diphtheria or shingles or pneumococcal) AND (intervention* or effect* or impact or strateg* or program* or evaluat*) AND (Algeria OR Angola OR Benin OR Botswana OR "Burkina Faso" OR Burundi OR Cabo Verde OR Cameroon OR "Central African Republic" OR Chad OR Comoros OR Congo OR "Côte d'Ivoire" OR Djibouti OR Egypt OR Eritrea OR Eswatini OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR "São Tomé and Príncipe" OR Senegal OR "Sierra Leone" OR Somalia OR "South Africa" OR Sudan OR Swaziland OR Tanzania OR Togo OR Tunisia OR Uganda OR Zambia OR Zimbabwe OR Africa* OR LMIC OR "developing countr*" OR "low-income country*" OR "middle-income countr*" OR "low and middle income countr" OR "limited resource" OR "low resource")).tw

Second search:
Replaced country-related keywords with: "India or Pakistan or Nepal or Bangladesh"

Articles identified through the searches were imported into the reference manager Endnote, and duplicates were removed. Remaining articles were screened by two reviewers in two stages: 1- by title and abstract, and 2- by full text (with reasons for exclusion) following strict inclusion and exclusion criteria.
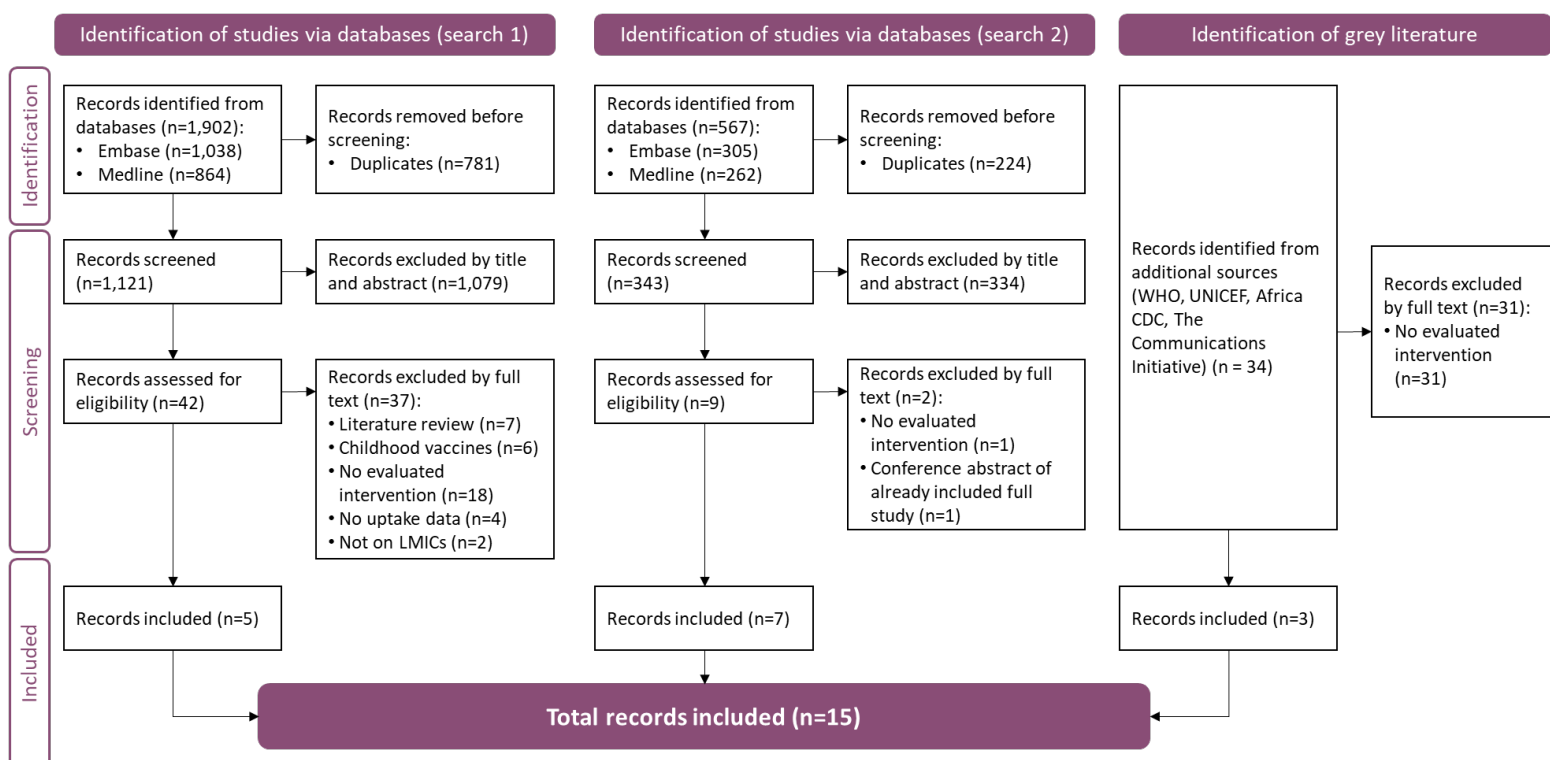
Inclusion and exclusion criteria

Inclusion criteria:

- *Participants:* adults, including specific populations (e.g. pregnant women, healthcare professionals)
- *Interventions:* evaluated interventions aimed at increasing adult vaccination coverage
- *Context:* any setting considered (e.g. health facilities, homes) in African/LMIC countries
- *Primary outcome:* uptake of adult vaccine(s), specifically those against Ebola or COVID-19
- *Secondary outcome:* intent, willingness, acceptance

Exclusion criteria:

- Articles published more than 10 years ago
- Articles on increasing knowledge, confidence, perceptions but not vaccine uptake
- Articles from countries outside of Africa/LMICs
- Articles on participation or vaccine uptake in trials
- Articles not evaluating the interventions
- Articles not in English and French language
- Articles not focusing on adult vaccines or Ebola or COVID-19 vaccines (e.g. childhood vaccines)

The literature search and screening procedures led to the identification of 15 studies. The PRISMA chart below summarises the different stages of the identification, screening and inclusion of literature.

Identification of studies via databases (search 1)

Identification

Records identified from databases (n=1,902):
- Embase (n=1,038)
- Medline (n=864)

→ Records removed before screening:
- Duplicates (n=781)

Screening

Records screened (n=1,121)

→ Records excluded by title and abstract (n=1,079)

Records assessed for eligibility (n=42)

→ Records excluded by full text (n=37):
- Literature review (n=7)
- Childhood vaccines (n=6)
- No evaluated intervention (n=18)
- No uptake data (n=4)
- Not on LMICs (n=2)

Included

Records included (n=5)

Identification of studies via databases (search 2)

Records identified from databases (n=567):
- Embase (n=305)
- Medline (n=262)

→ Records removed before screening:
- Duplicates (n=224)

Records screened (n=343)

→ Records excluded by title and abstract (n=334)

Records assessed for eligibility (n=9)

→ Records excluded by full text (n=2):
- No evaluated intervention (n=1)
- Conference abstract of already included full study (n=1)

Records included (n=7)

Identification of grey literature

Records identified from additional sources (WHO, UNICEF, Africa CDC, The Communications Initiative) (n = 34)

→ Records excluded by full text (n=31):
- No evaluated intervention (n=31)

Records included (n=3)

Total records included (n=15)

A data extraction table was created to summarise the following:
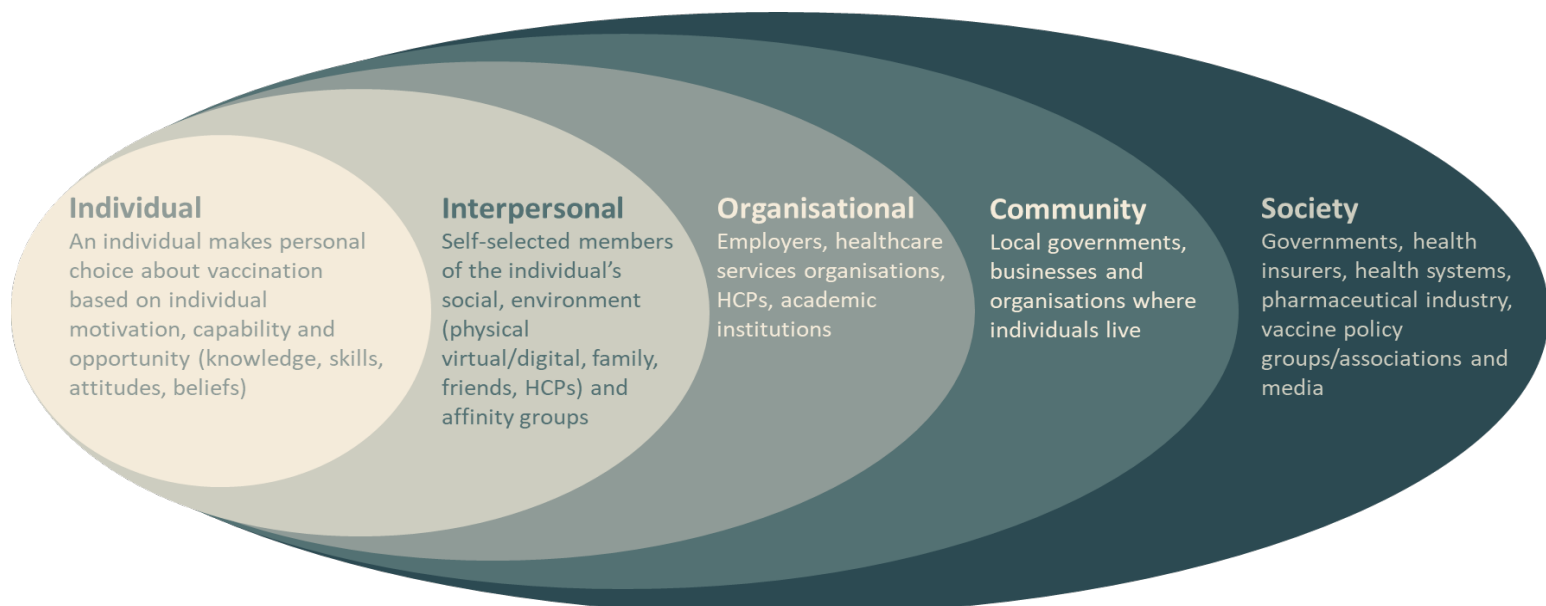
Study design and methodology: aim; country of intervention; study setting; primary & secondary outcomes; method for measurement of outcome; vaccine; evaluation method/study design

Population: Population type, sample size, key characteristics and demographics, population vaccinated if different from intervention population (including sample size, characteristics and demographics)

Intervention: Level(s), type, activities, frequency/dose, length, organisation/individuals administering the intervention, cost

Evaluation: Positive impact on study outcome, negative/no impact on study outcome, cost-effectiveness

A descriptive analysis was undertaken due to the heterogeneity of the data. Interventions described in the 15 articles were summarised according to the Socio-Ecological model[1] (see below).

Individual
An individual makes personal choice about vaccination based on individual motivation, capability and opportunity (knowledge, skills, attitudes, beliefs)

Interpersonal
Self-selected members of the individual's social, environment (physical virtual/digital, family, friends, HCPs) and affinity groups

Organisational
Employers, healthcare services organisations, HCPs, academic institutions

Community
Local governments, businesses and organisations where individuals live

Society
Governments, health insurers, health systems, pharmaceutical industry, vaccine policy groups/associations and media

1. Kolff CA, Scott VP, Stockwell MS. The use of technology to promote vaccination: A social ecological model based framework. Human vaccines & immunotherapeutics. 2018 Jul 3;14(7):1636-46.

PHASE 3: Toolbox of interventions to address local barriers and drivers to vaccination uptake in LMICs

The aim of phase 3 was to create a toolbox to synthesise the interventions identified through the literature review in phase 2 by the type of barriers and drivers of vaccine uptake (identified in phase 1) they could help address.

The toolbox was developed based on the Socio-ecological model to categorise interventions and on the COM-B model to categorise barriers and drivers of vaccine uptake.

The format was inspired by the ECDC catalogue of interventions to address vaccine hesitancy, available here: https://www.ecdc.europa.eu/en/publications-data/catalogue-interventions-addressing-vaccine-hesitancy

Local barriers and drivers to vaccine uptake across selected African countries

The review of data identified 11 key themes, discussed in details in the next few pages of this report

- Trends in willingness to receive a COVID-19 vaccine
- The role of emotions and sentiments
- Religion and ideologies
- Interventions for clinical trials
- Vaccine effectiveness and importance
- Mapping conspiracy theories and rumours
- Socio-economic demographics
- Trust sources of information
- Mistrust of vaccine trials
- Mistrust and vaccines
- Vaccine safety

Trends in willingness to receive a COVID-19 vaccine

Pre-pandemic confidence
The VCP conducted a pre-COVID study, mapping global trends in vaccine confidence (published in the Lancet). At that point, perceiving vaccines as important was a stronger predictor of uptake compared to perceiving vaccines as effective or safe. This is the flip side of risk perception: if individuals perceive there is a safety risk by taking the vaccine, but believe they are important to protect them from the risk of catching diseases, vaccine uptake is likely.

Another key finding of this pre pandemic study was that members of minority groups were less inclined to vaccinate. This is likely related to the different dimensions of trust, such as generalized trust, which influence vaccine confidence. More recently, during the COVID-19 pandemic when uncertainties were heightened, low uptake among minorities has been a key issue for vaccine deployment. This indication of low uptake is related to broader societal issues, and how trust issues all directly impact a decision to vaccinate.

Willingness to vaccinate against COVID-19
The COVID-19 pandemic has had a significant impact on vaccine confidence across Africa. As of 2020, willingness to vaccinate was mostly high in the continent, with exceptions such as the DRC (which has been historically sceptic about vaccination). This willingness is probably tied to a heightened sense of vulnerability to COVID-19. Unsurprisingly, not feeling at risk of COVID-19 was among the main reasons to not vaccinate. Again, feeling vulnerable to disease can make the risks associated with vaccines more tolerable.

Trends in confidence and volatility
Vaccine confidence can be volatile, particularly when risk perception has been heightened after highly publicized negative events associated with vaccination. This was the case in Nigeria, which previously had overall high willingness of vaccination. Reports of blood clots associated with the AstraZeneca vaccine has prompted drops in Nigeria (and elsewhere). This speaks to the uncertainty that comes with highly publicized safety events, and this drop can become a more permanent confidence issue if doubts remain.

Recommendations
- Do not consider only the most recent measurements of vaccine confidence, observe temporal trends instead.
- Rapid crises communication following adverse events.

Socio-economic demographics

Throughout African countries, we have found that the influence of socio-economic demographics such as residence or gender varies from one country to another, and also evolve over time.

The table below shows socio-economic demographics associated with lower willingness to receive a COVID-19 vaccination.

The data suggests interventions focusing on younger females with higher education living in urban areas would be particularly effective in Algeria, Cameroon, Cote d'Ivoire, Ghana, and Kenya.

On the other hand, interventions focusing on younger females with lower education living in rural areas would be more effective in Angola and Morocco.

Other countries will have different populations for which interventions are more effective.

Country	Residence		Gender		Education		Age	
	Rural	Urban	Male	Female	Lower	Higher	Older	Younger
Algeria		X		X		X		X
Angola	X			X	X			X
Burkina Faso						‡		
Cameroon		X		X		X		X
Cote d'Ivoire		X		X		X		X
DRC				‡		•		‡
Ethiopia				‡			‡	
Gabon					‡			‡
Ghana		X		X		X		X
Kenya		X		X		X		X
Malawi		‡		‡			‡	
Morocco	X			X	X			X
Mozambique		X	X		X			X
Niger		‡						
Nigeria	‡	X		X		X	X	‡
Senegal	X			X		X	X	
South Africa	‡	X		X	X			X
Sudan	‡	X		X		X		X
Tanzania		X		X		X	X	
Tunisia								‡
Uganda		X		X		X	X	‡

X = John Hopkins data (statistical significance not tested); ‡ = Africa CDC data, • = VCP/Janssen data

Rural vs urban areas

In most countries, people living in rural areas have higher confidence in and acceptance of COVID vaccines than those living in urban areas. Various factors could explain these differences: it could be that more vaccination campaigns (e.g. vaccines against polio or other childhood vaccines) have been targeted at rural areas, making use of local communities and strong engagement strategies. These could have reinforced communities' confidence in vaccination. Furthermore, we know that social and digital media usage is stronger in urban areas, which could have exposed residents living in big cities to more misinformation about vaccination, eroding their trust in COVID-19 vaccination. Studies have shown that in countries such as Cameroon, Cote d'Ivoire and Kenya, influential sources of information vary by urban or rural areas, which could confirm this. Some exceptions are to be noted: in Angola, Morocco and Senegal for example, those living in urban areas had higher confidence in vaccination which reinforces the importance of developing context-specific interventions.

Gender differences

Gender differences are more homogenous – with males showing higher acceptance of COVID-19 vaccination than females in all African countries. This could be because women are traditionally the decision-makers when it comes to health and vaccination decisions in the household, meaning that they may have previously been exposed to misinformation or rumours circulating around childhood vaccination, affecting their confidence in COVID-19 vaccination. Some differences are observed in relation to confidence (with women having more confidence in vaccine safety in Senegal, South Africa and Morocco than men) and exposure to misinformation (men reporting more beliefs in rumours in Morocco, Niger and Senegal).

Age and education differences

The impact of both age and education levels vary enormously from one country to another. In most countries, older age groups were found to be more inclined to take a COVID vaccine (and to trust healthcare bodies instead of social media). This is in line with previous studies, that have shown that confidence in vaccination in general is lower among younger generations and could once again be a sign of the effect of exposure to misinformation through the use of social media. People with lower education levels were also found to have more confidence in vaccination than those with higher education, again, consistent with findings from other studies. This has previously been explained by the fact that people with higher education levels are more engaged in their own health, and look for more information online or for alternatives to their doctors' recommendations.

Recommendations
- Interventions should be focusing on populations that are less confident in vaccination. However, as the impact of socio-economic demographics on vaccine acceptance varies from one country to another, interventions need to be adapted to each country and context

Vaccine effectiveness and importance

Effectiveness and importance: key influencers of vaccine acceptance
Unsurprisingly, people's perceptions of the effectiveness and the importance of vaccine can strongly influence their willingness to receive vaccine in general. When referring to importance, we mean both the perceived severity of a disease and the perceived risk of catching it. In some countries, like DRC, these perceptions can be more influential in driving vaccine uptake than concerns about vaccine safety.

Perceived risk of COVID-19
This is also the case with COVID-19 vaccination, although we have not seen people questioning the need for the vaccines themselves or their importance. This seems to show people are aware of the importance of preventing COVID-19 and the value of vaccines and could be an important starting point for communications. However, there have been more doubts in relation to people not feeling at risk of COVID, particularly in Cote d'Ivoire, Guinea and DRC. This could be an effect of the disease being more threatening to older age groups and those with chronic diseases. Communication in the past few months has often focused on the risk of disease for the populations. This means that communications to try to boost uptake in younger cohorts should really focus on the importance of community protection, and getting vaccinated to prevent infection in others who are more at risk as well as to be able to go back to a more normal life by controlling the pandemic.

Although not picked up with this project, concerns about vaccine effectiveness were also quite important at the beginning, when vaccines were being produced. While these have not been so important more recently, they could resurface with the discovery of new variants that could be more resistant to vaccines.

Messages of hope
We have seen this with the Ebola pandemic, where people expressed hope and willingness to take part in vaccine trials because of the possibility to prevent disease and future outbreaks, playing a key role in stopping transmission. This 'active role' people can take should be encouraged, and if communication frames COVID vaccination as a personal step people can take to contribute to the control of COVID, this could be beneficial.

Recommendations
- Positive messaging focused on protection and disease prevention
- Convincing those at lower risk of COVID is essential
- Framing vaccination as a personal, active step to control COVID (hope)

Vaccine safety

Safety: key influencer of vaccine acceptance
Vaccine safety perceptions are one of the key factors influencing willingness to accept vaccination in general, with concerns increasing in some countries between 2015-2019, already ahead of the COVID-19 pandemic.

Concerns with new vaccines
Concerns about vaccine safety tend to be more important when it comes to new vaccines, we have seen this previously with HPV vaccination or Ebola and we are seeing it now with COVID. This is due to the fact that people believe new vaccines have not been tested sufficiently, and there is insufficient evidence about the possible short and long term side effects of the vaccines. In relation to COVID, we have seen concerns about vaccine safety influence people's willingness to receive a vaccine in most African countries, except in Ethiopia, a country where confidence and willingness to receive COVID-19 vaccines is very high. Positive information on the processes of vaccine development, testing and manufacturing is therefore essential to ensure people understand and have more trust in the system.

Impact of social media and rumours
One of the most important contributors and triggers of concerns around vaccine safety is misinformation circulating on social media, and we have seen that people who use or trust social media more have more concerns about vaccine safety – this was the case in Morocco for example. Similarly, those who believe COVID-related conspiracy theories (such as the theory the disease doesn't exist or was created to control world populations) also have more concerns about safety. This shows the importance of improving the quality of information available on social media, by flooding social media with positive information as well as managing misinformation.

An important point to mention is the impact that real side effects can have on vaccine programs. We have seen that the reports of blood clots following certain COVID-19 vaccines for example have not only decreased confidence in these vaccines (and COVID-19 vaccination in general) but have also contribute to the spread of further misinformation and rumours around COVID-19 in countries like Nigeria. This shows the importance of having strong crisis communication and preparedness plans to manage such events and to respond very quickly when such events occur – not only acknowledging some side effects can happen with vaccines, but also showing empathy and listening to those affected rather than dismissing them.

Common rumours: sterility, death and getting COVID-19 from the vaccines

One of the most common rumour circulating, particularly on social media, around covid-19 vaccine safety is related to sterility. This is not new, and has been the case with many interventions, including Ebola vaccines and HPV vaccine introductions more recently. One of the one hand, they often come together with large conspiracy theories (for example those claiming Bill Gates created the virus to vaccinate more people and control the world population by making them infertile) but on the other these rumours are also grounded in some of the darker past of experimentation issues in Africa. Multiple trials in the past, not necessarily for vaccines, have created safety issues, sometimes around fertility. These rumours are deeply linked with mistrust of foreign organisations and governments, which we will discuss later in this presentation. However, it is important that communication strategies address the specific concerns people have about covid vaccines, including sterility. Some documents have already been produced by organisations such as WHO addressing this issue.

Another rumour includes that you can get covid from the vaccine – this is something we had already seen with Ebola in the past and with other vaccines such as flu. Specific and targeted messaging can respond to these rumours by spreading more positive information about the different types of vaccines (live vs not) and how they work. Finally, we've also seen rumours spread on social media (but not so much through surveys) about the vaccine being linked to deaths, particularly of children. There was for example a rumour circulating about children dying from the vaccine in Senegal and South Africa, before the vaccine had even been introduced/trialled in these countries.

Recommendations
- Vaccine messaging should address vaccine safety and specific concerns (e.g. sterility)
- Positive information on testing
- Flood social media with positive information & manage misinformation

Religion and ideologies

Less confidence among minority religious groups

Compared to other factors, such as vaccine safety or importance perceptions, religious beliefs are often less strongly associated with COVID-19 vaccine uptake. However, when associations are found such as in Ethiopia, South Africa, DRC or Ghana, it is often within minority religious groups. This means it is essential that these groups are specifically targeted early on by engagement strategies, to ensure that their voices are heard and they become key partners in implementing vaccination programmes.

Long-lasting and damaging effects

This is particularly important as while on a regular basis religion might not be a strong influencer of vaccine acceptance, when an issue develops it can have long-lasting and highly damaging effects on confidence. We have seen this with vaccination campaigns against tetanus and polio in the past, where religious leaders played an important role in spreading misinformation and convincing their communities not to get vaccinated.

Other ideologies: natural medicine

In addition to religion, we need to ensure we take into consideration other close-knit groups, such as those with similar ideologies. This is the case of those using natural medicine or homeopathy for example. These ideologies can sometimes conflict with vaccination, as is sometimes the case with natural or traditional healers that do not recommend vaccination and instead recommend 'natural immunity' by getting infected with a disease. We have seen this in DRC, but is also important in other countries to varying extents. Once again, this shows the importance of including these community leaders in discussions and decisions very early on to come up with communication and implementation strategies together.

Recommendations
- Engagement of community leaders (religious leaders, traditional healers) is key, including minority groups

The role of emotions

Emotions are context-dependent

Emotional determinants of health and health outcomes are not universal. They are highly variable, context dependent and one emotion might lead to different outcomes. For example, fear and anxieties about a certain vaccine can push people away from vaccination and even make them more susceptible to misinformation and fake news. In other stances, fearing the pandemic or anxious about its long term effects have actually pushed people to vaccinate in certain settings.

Fears and uptake

The emotions identified through research and fieldwork will need to be interpreted and understood within a broader social and historical context. Feeling fearful of the pandemic was associated with higher COVID-19 vaccine uptake intent in Ethiopia and Nigeria. However, in setting such as Sierra Leone, which has long histories of colonial exploitation, the fears about Ebola quickly fuelled long-held mistrust in foreign workers and their initiatives such as Ebola vaccine clinical trials.

Altruism

There are also emotions that can help build vaccine confidence. During clinical trials in Sierra Leone, altruism was discussed by trial participants as their reason to join the trial. They wanted to help their community, even if that meant exposing themselves to risks and uncertainties. This was also tangled with feeling hopeful for a better future, free of disease, for themselves and those around them. This much increased participation in clinical trials and ultimately supported the development of an Ebola vaccine.

Hope

One of the ways to navigate uncertainty is to project a better and safer future ahead, one free of risk of disease. This sense of opportunity, of hope and potential of a better life led clinical trial participants reassured to participate. Giving hope to trial participants and those receiving medical interventions always needs to be balanced. A great amount of attention should be given to not creating *false hope* which can backfire as long term mistrust. Be transparent about real benefits and risks without inflating them. There are many socio-economic issues in low- and middle-income countries, and a vaccine or a trial should not be advertised as a solution to all of life's ailments. Hope must be nurtured ethically and institutions and health officials should aim, first, to be perceived as trustworthy.

> **Recommendations**
> - Do not create *false hope* that can lead to long term mistrust. Be transparent about real benefits without inflating them

Mapping conspiracy theories and rumours

Rumours are not just misinformation

There is a commonly held belief that misinformation is caused by a deficit of information, that the best way to combat it is bombard a population with scientific facts. Strategies based on this 'information deficit' model have proved deficient and have, at times, backfired into more suspicions of experts and health authorities. Rumours and misinformation are, many times, related to realities in which participants are embedded (i.e. blood stealing rumours or seeing themselves as 'guinea pigs' speak to long histories of unethical clinical experimentation in African population; or trials for medications that those patients would not have access once approved).

Spread of rumours and conspiracy theories

Unsurprisingly, those who believe rumours and conspiracy theories were less likely to vaccinate. Youngsters, in particular men, appear to be more inclined to believe misinformation. This could be related to access and use of social media. Misinformation about vaccines are rife and many times social media is where anti vaccination groups organise and spread vaccine skepticism. At the same time, social and digital media allow concerns and skepticism to travel transnationally and concerns are no longer bounded by geography. Concerns can become 'viral' and impact different parts of the globe.

Common rumours

The were suspicions of foreign actors in the creation and spread of COVID, in particular the role of China. Again, this concern has been reported elsewhere and it is difficult to pin where it originated. Africans remain concerned of falling victims of unethical experimentation and this is a barrier not only for uptake, but also for the need to run clinical trials in the country. Other rumours of 5G causing COVID-19 and children dying after vaccination are also a reflection of feeling vulnerable to unknown agents, and feeling powerless or not in control of their own health and choices.

While there is skepticism about COVID-19 vaccination, there appears to be no doubt that COVID-19 exists, is real and is affecting the population.

Recommendations
- Engage trusted community brokers to back vaccination programs;
- On a larger scale, develop wide spread communication material addressing each of the most cited rumours.

Mistrust and vaccines

Mistrust of institutions and health authorities

The different dimensions of trust have shown to impact the acceptance of COVID-19 vaccination across the African continent. Mistrust in institutions, both local and international, is translating into mistrust in vaccination programmes. Mistrust in local authorities is likely linked to inefficient and fragmented healthcare systems. If healthcare services, including vaccination, is not routinely accessed by populations there might be suspicions over mass vaccination pushes. Malaria clinical trials and polio immunization efforts were already undergoing heavy criticism in social media.

Mistrust of international institutions

Mistrust of international institutions, health officials and researchers is of concern. During outbreaks such as Ebola and COVID-19 pandemic the influx of foreign scientists and initiatives, which are much needed, was received with mistrust by populations. Latent concerns over trials and research conducted not to the benefit of the population has led to mistrust.

Mistrust of vaccine production

There were also concerns over the speed of COVID-19 vaccine production. While this was common across countries in Africa, it resonates with concerns in the rest of the world. The usual time of production of a vaccine was approximately 15-10 years, with the exception of mumps vaccine (which took approximately 4-5 years). Never had a vaccine been produced and approved in such a short period and this, of course, let to concerns globally.

Recommendations
- Liaise with local health authorities to contribute to their trust building efforts as this is necessary for trust in the vaccine.

Trusted sources of information

Most trusted sources of information
Across all countries (and most socio-economic demographics), the most trusted sources of information include WHO, healthcare workers, governments and community organisations. This shows the importance of improving communication and engagement from these sources. However, in some countries, confidence in HCPs is lower, and in others, HCPs are also becoming hesitant and unwilling to receive COVID-19 vaccination. This is an area of priority, as if trusted sources of information are themselves hesitant, they can negatively influence their patients and communities in the long-term. Efforts should be focusing on working together with HCPs to improve their confidence (listening to the concerns and answering their questions) as well as improving their role in communicating with and engaging patients.

Trust in governments
Generally, populations were satisfied with the way the pandemic was managed by governments and health authorities, although this has decreased in some countries since August 2020. There is also strong mistrust of governments in certain countries, which could be linked to past events. In DRC for example, the war and the way the Ebola epidemic were managed could influence people's trust in the government. In Nigeria, stories of heavy handed police interventions to control COVID-19 could have reduced trust in authorities. Mistrust of governments can have negative long-term effects. These need to be dealt with urgently, to prevent the COVID-19 pandemic from causing further damage to trust.

Trust in international organisations
Strong trust in international organisations such as the WHO, Africa CDC or Gavi was found in many countries, including among those who trust social media. Interventions to improve confidence could focus on messages from international organisations on social media. Yet, trust is lower in rural areas, perhaps because of lower presence from these institutions in these areas. There, the focus should be placed on local community leaders and authorities.

The media
The role of radio was highlighted in many countries as one of the key trusted channels of information, except in Cote D'Ivoire (TV) and South Africa (newspapers). Messages coming from trustworthy sources (WHO, health workers, governments or community organisations) should be disseminated through radio in most countries. However, people who rely the most on social media were found to be more hesitant to vaccinate and believe disinformation (especially in cities and among younger age groups). This shows the importance of developing engaging and peer-to-peer strategies using social media to flood channels with positive and reliable information. Efforts to remove or control misinformation (or train people to identify misinformation) should also be implemented. The social media platforms used will be important. In Nigeria, WhatsApp was particularly important, showing strong reliance on family and friends. In other countries, it could be Facebook, Twitter or tiktok.

Recommendations
- Regional differences suggest the need for country-specific approaches
- Given the high level of trust in WHO, a collaborative effort between WHO and local stakeholders, on the most popular and trusted media channels may serve to disseminate vaccine messaging widely

Mistrust of vaccine trials

Specific issues to vaccine trials

Vaccine clinical trial recruitment and participation naturally bring extra challenges compared to vaccines already approved. Perceptions of safety and effectiveness and important building blocks of vaccine confidence. These cannot be guaranteed during clinical trials as the product is likely being tested for both during trials. In addition to this inherent challenge, several African countries have had issues with real ethical failures during clinical trials, including failures to seek adequate informed consent. Mistrust in clinical trials is deeply rooted in such past circumstances which makes it harder to be dealt with.

Experimentation mistrust

In addition, many pharmaceutical drugs are tested in population who not longer can afford them once they have been approved. This has been the case for HIV drugs, largely tested in the continent where there are still serious issues of access to populations who carry a hefty burden of disease. With COVID-19 vaccination is not different: as the continent grapples with excess deaths from COVID and other societal and economic issues caused by the pandemic, there is still an overwhelming issue of vaccine supply to the continent. Once again, populations participating in trials will not have access to the vaccine until much later, if at all.

Breaches of ethical standards

International health authorities have also been made responsible for breaches in ethical standards and lack of informed consent from participants. Given their support and approval is necessary for trials, it is no wonder why populations are also very wary of their intentions and mistrustful of potential hidden agendas in clinical trial efforts.

Recommendations
- Build trustworthiness through ethical recruiting and informed consent before the trials start.

Interventions for clinical trials

Top-down vs bottom-up approaches
During the 5 year EBODAC project, which focused in community acceptance of Ebola vaccine clinical trials, many lessons were learned which can be used for different vaccine trials. There has always been discussions over top-down and bottom-up approaches, usually putting them in opposition. Our EBODAC work found that, in fact, both can and should co-exist as long as it is considered by clinical trial managers and population remains involved in the process of clinical trials, being well informed and consenting to participation.

Risk perceptions during trials
There is, at times, ambivalence of participants: at the same time the trials are much needed, there might be trust issues due to a plethora of reasons already discussed. The risks should be very well explained, and benefits should not be inflated to convince participants to join. They need to be informed that joining a trial will not necessarily protect them from disease and that they still need to continue with other protective measures after being immunized.

Role of research groups
Research groups need to be put in contact with the population in a way that does not feel threatening or distant. Opened communication is key to start creating trust in a population. Besides power dynamics from researchers/clinical trial manages and population, there are also intra community dynamics that will likely impact the work and will need to be attended to.

Training
In remote places where internet access was very limited, mobile training via cell phone calls were very well accepted and have increased the knowledge in the health care workers.
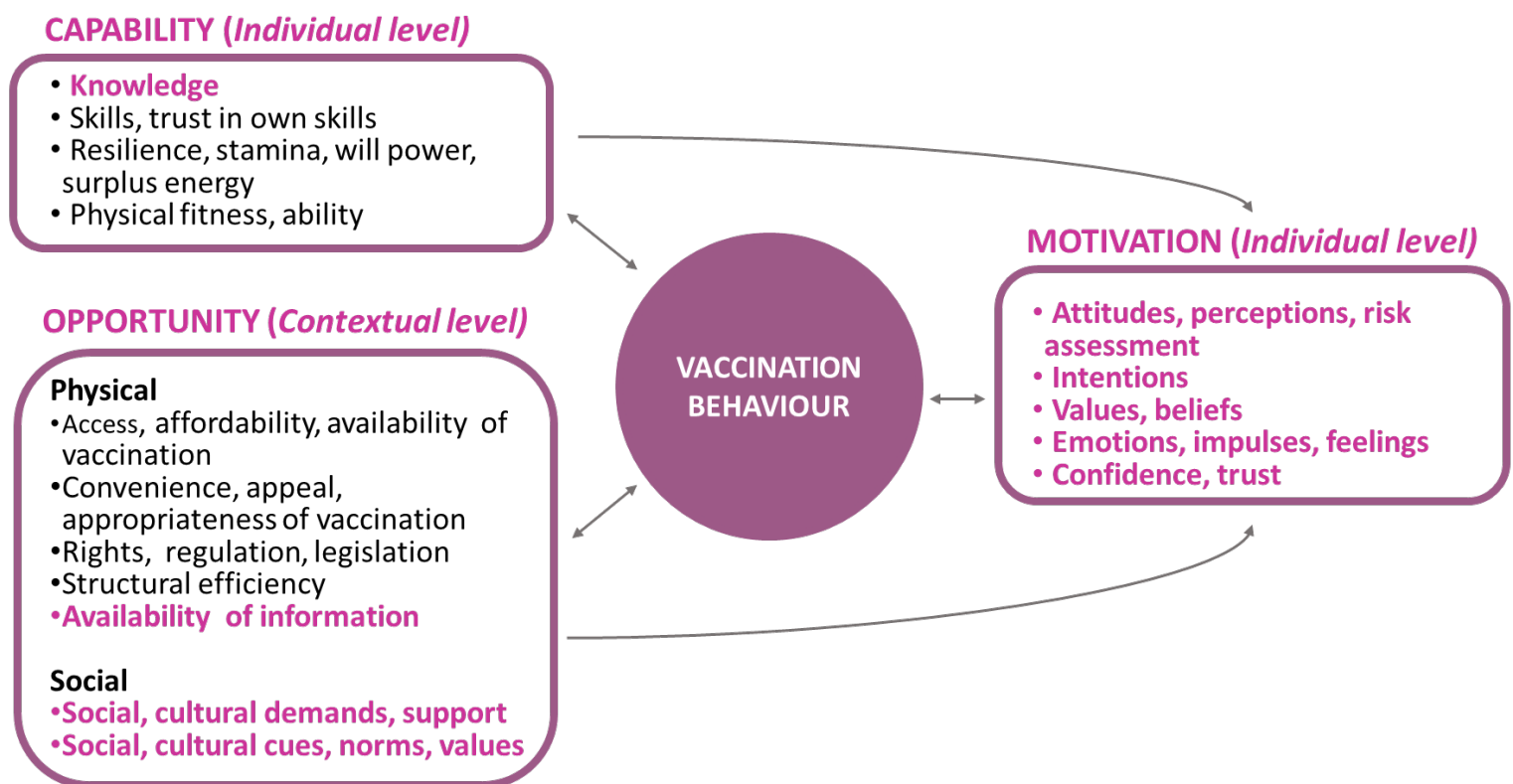
> **Recommendations**
> - Train the active community health workers to engage with clinical trial challenges.
> - Community engagement needs should not be a one-off activity, but rather a continuous effort during trials.

Synthesising local barriers and drivers to vaccine uptake across selected African countries:
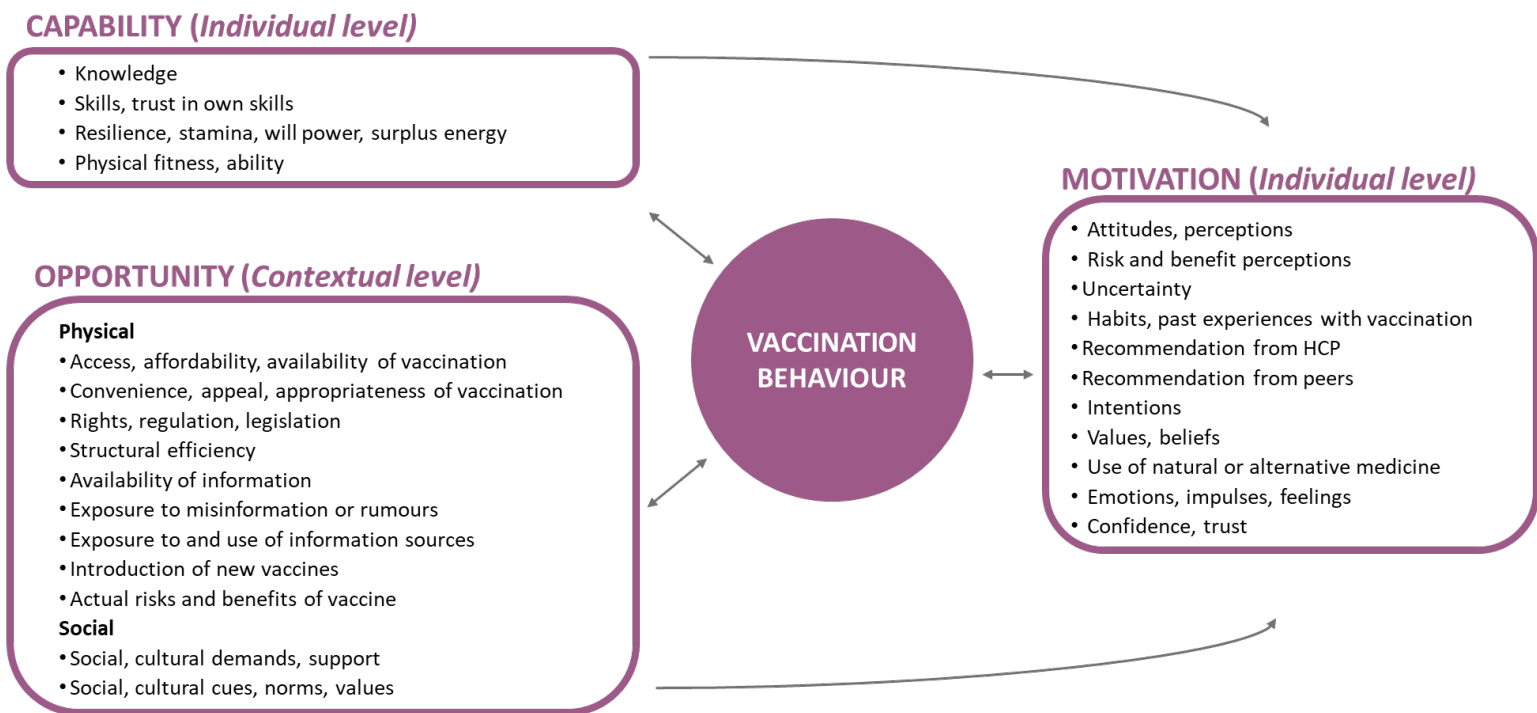## The use of the COM-B model

In order to synthesise the local barriers and drivers to vaccine uptake identified across selected African countries, they were compared to the version of the COM-B model adapted for vaccination by WHO[1]. The first model below presents the COM-B model with elements identified in this study highlighted in pink. The second model is an adaptation of the COM-B model that includes additional barriers and drivers identified through this project.

The COM-B model

CAPABILITY (*Individual level*)

- **Knowledge**
- Skills, trust in own skills
- Resilience, stamina, will power, surplus energy
- Physical fitness, ability

OPPORTUNITY (*Contextual level*)

Physical
- Access, affordability, availability of vaccination
- Convenience, appeal, appropriateness of vaccination
- Rights, regulation, legislation
- Structural efficiency
- **Availability of information**

Social
- **Social, cultural demands, support**
- **Social, cultural cues, norms, values**

VACCINATION BEHAVIOUR

MOTIVATION (*Individual level*)

- **Attitudes, perceptions, risk assessment**
- **Intentions**
- **Values, beliefs**
- **Emotions, impulses, feelings**
- **Confidence, trust**

1. Tailoring Immunization Programmes (TIP). Copenhagen: WHO Regional Office for Europe; 2019

The revised COM-B model

CAPABILITY (*Individual level*)

- Knowledge
- Skills, trust in own skills
- Resilience, stamina, will power, surplus energy
- Physical fitness, ability

OPPORTUNITY (*Contextual level*)

Physical
- Access, affordability, availability of vaccination
- Convenience, appeal, appropriateness of vaccination
- Rights, regulation, legislation
- Structural efficiency
- Availability of information
- Exposure to misinformation or rumours
- Exposure to and use of information sources
- Introduction of new vaccines
- Actual risks and benefits of vaccine

Social
- Social, cultural demands, support
- Social, cultural cues, norms, values

VACCINATION BEHAVIOUR

MOTIVATION (*Individual level*)

- Attitudes, perceptions
- Risk and benefit perceptions
- Uncertainty
- Habits, past experiences with vaccination
- Recommendation from HCP
- Recommendation from peers
- Intentions
- Values, beliefs
- Use of natural or alternative medicine
- Emotions, impulses, feelings
- Confidence, trust

This revised model should also be understood within the context of socio-demographic variables that can influence behavior at different levels and vary with context. Additionally, some contextual factors that are not linked to opportunity did not fit in the model and should be taken into account: historical influences, period of uncertainty (pandemic), political or geographic barriers, past behaviours of governments, pharmaceutical industry.

1. Tailoring Immunization Programmes (TIP). Copenhagen: WHO Regional Office for Europe; 2019

Barriers to COVID-19 vaccination in Africa: lessons learnt from using the COM-B model

- The COM-B model was used as a framework to organise the different barriers and themes identified as possible barriers to the uptake of COVID-19 vaccination in Africa

- As the review of barriers was conducted using specific existing data from the VCP, some of the factors included in the COM-B model (e.g. access) were not identified in our analysis. Further primary research should be conducted with the explicit objective of evaluating the different factors included within the COM-B model and their impact on COVID-19 vaccine acceptance

- Additionally, our grounded theory approach to identify themes influencing COVID-19 vaccine acceptance led to the identification of themes that were difficult to fit in the COM-B Model. Many of these related to trust (which could be covered by the Vaccine Confidence Project model of trust), and while others were fitted in the model – doing so led to losing important nuances

- We recommend the development of a primary research with the aim of specifically testing the COM-B model elements and the themes identified through our review through surveys and qualitative interviews conducted in various countries in Africa. This could lead to the development and validation of a revised and updated model of vaccination decision-making.

Summary of included studies and outcomes

The table below provides a summary of the studies included in the review, with some key information such as the country, vaccine and population targeted, the intervention level according to the Socio-Ecological model, and whether positive outcomes were observed on vaccine intentions and uptake.

REFERENCE	COUNTRY	VACCINE	POPULATION	INTERVENTION LEVEL(S)	POSITIVE OUTCOME
Jin2021	Pakistan	COVID-19	Adults (>18)	Individual: Education, information, communication	Intent: Yes
Nkwonta2020	Nigeria	HPV	Adults (18-65)	Individual: Education, information, communication	Intent: Yes
Ugwuoke2021	Nigeria	COVID-19	Adults (conflict victims)	Individual: Education, information, communication	Intent: Yes
Painvin2011	Cambodia	Tetanus	Women	Individual: Education, information, communication	Uptake: Yes for one dose *(no sign. impact for catch-up)*
Payaprom2011	Thailand	Influenza	Adults (high risk)	Individual: Education, information, communication	Intent: Yes *Uptake: no sign. increase*
Sato2020	Nigeria	Tetanus (maternal)	Women (childbearing age)	Individual: incentives	Uptake: Yes
Talabi2021	Nigeria	COVID-19	Adults (social media users)	Individual: counselling	Intent: Yes
Onuekwe2015	Nigeria	Meningococcal A	Adults (16-29)	Community: Education, communication, information	Uptake: Yes*
Giduthuri2019	India	Influenza (maternal)	Pregnant women	Organizational: Education and information delivery	Uptake: Yes in middle-income clinics *(no sign. impact in slums)*
Balakrishnan2016	India	Tetatnus (maternal)	Pregnant women	Organizational: Case-management (follow-up or reminder)	Uptake: Yes*
Prinja2017	India	Tetanus (maternal)	Pregnant women	Organizational: Case-management (follow-up or reminder)	*Uptake: No sign. impact*
Sullivan2015	Pakistan	Tetanus (maternal)	Pregnant women	Organizational: Case-management (follow-up or reminder)	Uptake: Yes*
Bock2016	Nepal	Pneumococcal	Adults	Society: Quality improvement principles	Uptake: Yes
Imtiaz2017	Pakistan	Tetanus (maternal)	Pregnant women	Society: Public Private Partnerships	Uptake: Yes
Bishop2021	South Africa	Influenza	Pregnant women	Individual, organizational, societal: mix interventions	Uptake: Yes*

significance levels not provided

The full list of references is available on the next page.

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Individual level interventions (n=6)

Education, information or communication
Significant increase in uptake and willingness to vaccinate were observed following:
- visual messages on Covid-19 in Nigeria: mean intention increased from 1.1 to 3.8 vs 1.2 to 1.3 for controls for Covid-19 (Ugwoke 2021)
- oral presentations and written pamphlets on HPV in Nigeria: intent increased from 18% to 53% for pamphlets and 69% for presentations (Nkwonta2020)
- theory-based educational leaflets on influenza in Thailand: mean intention increased from 7.21 to 9.24 vs 7.34 to 8.38 for controls, $p < 0.001$, but no impact on uptake identified (Payaprom2011)
- documentary on tetanus in Cambodia: 70% one dose uptake vs 46% for controls, but no impact for catch-up campaign (Painvin2011)

In Pakistan (Jin2020), perceived threat of Covid-19, perceived benefits of Covid-19 vaccines and self-efficacy positively influenced vaccine willingness more favourably for fear appraisal-framed public service messages than safety benefits public service messages

Incentives
Women in Nigeria (Sato2020) who received cash incentives were significantly more likely to vaccinate against tetanus (x3.36 for small incentives and x7.58 for higher incentives, $P < 0.001$)

Interpersonal level interventions (n=1)

Counselling
In Nigeria (Talabi2021), counselling conducted via social media significantly increased COVID-19 vaccination intent (mean intention increased from 1.2 to 3.6 vs 1.1 to 1.4 for controls)

Organisational level interventions (n=4)

Case-management with follow-up or reminders
Three studies in India & Pakistan looked at the impact of case management and follow-up or reminder systems, some complemented by educational activities, on maternal tetanus vaccination. Three studies found increases in vaccination uptake but one study (Prinja2017) showed results were not statistically significant and the two others did not report significance levels (Sullivan2020, Balakrishnan2016).

Education and information delivery
A study in India (Giduthuri2019) found that educating ANC providers on maternal influenza vaccination (scientific information in S1, and information on community views of vaccination in S2) significantly increased vaccine uptake among pregnant women in middle-class community clinics (from 2.6% to 12.2% at S1 and 37.8% at S2, vs 0.2%-0.1%-0.2% for control sites, $p < 0.005$). No effects were found in slum clinics.

Community level interventions (n=1)

Education, communication, information
One study (Onuekwe2015) found that education provided alongside entertainment (i.e. dance groups, DJs, motorcycles) showed an increase in Meningococcal A vaccination among adults aged 16-29 years old (from around 8 to 12% with varying trends). No statistical analyses was provided.

Society level interventions (n=2)

Education, communication, information
One study from Pakistan (Imtiaz2017) found that the use of Public Private Partnerships (PPPs) to provide primary healthcare, including maternal and child care, significantly increased the uptake of tetanus toxoid vaccination among pregnant women by 42% (p<0.001) (uptake rate in the first year of PPP vs second year)

Quality improvement principles
One study (Bock2016) found that implementing quality improvement principles (including provider and nurse education, standing order to empower nurses to vaccinate, new medical record form) in a hospital in Nepal significantly increased pneumococcal vaccination among discharged adults from 2.5% (pre-intervention) to 42% (p<0.001)

Mixed level interventions (n=1)

- A study from South Africa (Bishop2021) looked at a mix of different interventions aimed at increasing influenza vaccination among pregnant women, including:
  - Increase of vaccination doses available to ANCs (society level)
  - Training of healthcare workers at ANCs on influenza, influenza vaccination, vaccination of pregnant women (organisational level)
  - Short daily health talks and information provided about influenza vaccination to pregnant women (individual level)
- This resulted in an increase in influenza vaccine coverage among pregnant women in participating ANCs, from 69.7% in 2015, to 86.3% in 2016, 80.2% in 2017, and 79.5% in 2018 (no statistical significance information provided)

Conclusions and recommendations

Key takeaways and recommendations

Most interventions had a positive impact on vaccine uptake and intentions, with the following found to *significantly* improve uptake/intent:

- **Individual level:** communication (visual or oral messages, counselling, written pamphlets or leaflets); fear appraisal-framed messages; financial incentives
- **Organisation level:** educating antenatal care providers (maternal vaccination)
- **Society level:** use of public-private partnerships; implementation of quality improvement principles in hospital settings (e.g. provider education, empowering nurses to vaccinate, medical record forms)

Interventions on COVID-19 only focused on the individual-level (communication & counselling), but showed positive outcomes on vaccine uptake

Based on available evidence, we recommend roll-out of vaccines in the region to be accompanied by mixed-level interventions (in particular: individual, organisational, and societal levels) aimed at increasing uptake and willingness to vaccinate

Gaps in research on strategies to improve adult vaccination in Africa and recommendations

Limited number of studies and low quality of evidence point to lack of research about strategies to increase adult vaccination in Africa. Most studies identified focused on Nigeria and maternal vaccination, highlighting the need for further studies, particularly on COVID-19.

Communication-based strategies across different levels were the most studied type of intervention and showed effectiveness in increasing vaccine uptake and willingness, including for COVID-19. Yet, despite the importance of communities and social networks in influencing beliefs and behaviours (e.g. using religious or community leaders), only one intervention evaluated at community level. More interventions at various levels of the socio-ecological model should be evaluated. Additionally, certain types of interventions have not been evaluated (e.g. effect of mandates, or strategies to address convenience such as supply chain or accessibility).

Efforts should also be strengthened to publish and disseminate all available evidence on strategies to improve adult vaccination.

Toolbox of interventions to address local barriers and drivers to vaccination uptake in LMICs

Findings from the review of local barriers and drivers to vaccine uptake and interventions to address these barriers and drivers were synthesised in the form of a toolbox, available in the next few pages.

Interventions are categorised according to the Socio-Ecological Model. For each intervention, information about which barriers to vaccination it can address is provided according to the revised version of the COM-B Model developed as part of this project.

A description of possible interventions or activities is provided, as identified in the literature, together with a summary of how and where these interventions have been evaluated and the impact on vaccine uptake or intentions.

COMMUNICATION MATERIALS

Determinants addressed: Capability (knowledge, skills), **Opportunity** (availability of information, exposure to and use of information), **Motivation** (attitudes and perceptions, risk and benefit perceptions, uncertainty, habits, intentions, values and beliefs, confidence, trust)

Possible interventions

Education, information or communication materials can include: visual illustrations, pamphlets, leaflets, documentaries (story-telling or scientific information), or oral presentations. Materials can be combined with small counselling sessions or possibility to ask questions.

Information can be provided on vaccine preventable diseases (e.g. risks, severity, incidence, perceived threat), vaccines (e.g. availability, risks and benefits) or self-efficacy. It can be framed using certain techniques such as fear appraisal.

Evaluations of this type of interventions

COUNTRIES

- Cambodia, Nigeria, Pakistan, Thailand

SETTINGS

- Urban or community locations, camps for internally displaced people, non-specific

TARGET POPULATIONS

- Adults, victims of conflict or insecurity, high-risk groups, adult women

VACCINES

- COVID-19, Human Papillomavirus, Influenza, Tetanus

IMPACT

Significant increases in **vaccine intentions** were observed for visual illustrations combined with counselling (COVID-19), pamphlets (HPV), leaflets (influenza) and oral presentations (HPV), the use of fear appraisal-framed public service messages (COVID-19).

Significant increases in **vaccine uptake** were observed following documentaries (tetanus).

Further resources: Jin2021, Nkwonta2020, Painvin2011, Payaprom2011, Ugwoke 2021

FINANCIAL INCENTIVES

Determinants addressed: Opportunity (access, affordability, convenience, appeal), **Motivation** (intentions)

Possible interventions

Interventions could include different types of one-time small or large cash incentives to motivate individuals to accept vaccination. Information about vaccine-preventable diseases and vaccination could be provided at the same time as the cash incentives are distributed.

Evaluations of this type of interventions

COUNTRIES

• Nigeria

SETTINGS

• Locations with low vaccine uptake rates

TARGET POPULATIONS

• Adult women of childbearing age

VACCINES

• Tetanus

IMPACT

Significant increases in vaccine uptake were observed following the use of small incentives and high incentives (tetanus)

Further resources: Sato2020

COUNSELLING

Determinants addressed: Capability (knowledge, skills), **Opportunity** (availability of information, exposure to and use of information), **Motivation** (attitudes and perceptions, risk and benefit perceptions, uncertainty, habits, intentions, values and beliefs, confidence, trust)

Possible interventions

Counselling can be provided through social media (e.g. Whatsapp groups) focusing on importance and safety of vaccination and prevention of diseases. Counselling can also specifically address the spread of fake news.

Evaluations of this type of interventions

COUNTRIES

• Nigeria

SETTINGS

• Social media users

TARGET POPULATIONS

• Adults

VACCINES

• COVID-19

IMPACT

Significant improvements in COVID-19 vaccination intentions were observed following social media counselling (COVID-19)

Further resources: Talabi2021

COMMUNICATION AND ENGAGEMENT

Determinants addressed: Capability (knowledge, skills), **Opportunity** (availability of information, exposure to and use of information sources, social, cultural demands and support, cultural cues, norms and values), **Motivation** (attitudes and perceptions, risk and benefit perceptions, recommendations from peers, uncertainty, habits, intentions, values and beliefs, confidence, trust)

Possible interventions

Community-level communication and engagement can include the use of education (e.g. public announcements) provided alongside entertainment (e.g. dance groups, DJs, motorcycles)

Evaluations of this type of interventions

COUNTRIES

• Nigeria

SETTINGS

• Urban settings

TARGET POPULATIONS

• Adults

VACCINES

• Meningococcal A

IMPACT

Increases in vaccine uptake (*significance levels not provided*) were observed following intensified mobilisation through entertainment-education events (Meningococcal A).

Further resources: Onuekwe 2015

CASE MANAGEMENT

Determinants addressed: Opportunity (Access, structural efficiency), **Motivation** (recommendation from HCP)

Possible interventions

Healthcare professionals (e.g. frontline workers, nurses or midwives, community health workers) can be trained in the use of traditional or m-health platforms to facilitate case management (tracking and registering target populations, with follow-up planners, scheduler and checklists). Case management can also be complemented by reminder systems.

Evaluations of this type of interventions

COUNTRIES

• India, Pakistan

SETTINGS

• Non-specific

TARGET POPULATIONS

• Pregnant women

VACCINES

• Tetanus (maternal)

IMPACT

Increases in vaccine uptake (tetanus) were observed following the implementation of case management complemented by reminder systems or not (*significance unclear: one study showed non-significant increase and one did not report significance levels*)

Further resources: Balakrishnan 2016, Prinja 2017, Sullivan 2020

EDUCATION OF HCPs

Determinants addressed: Opportunity (Access, structural efficiency), **Motivation** (recommendation from HCP)

Possible interventions

Educating healthcare professionals through the provision of scientific information on the need for vaccination and risk of vaccine-preventable diseases (WHO recommendations, scientific articles, expert reports) and/or community views of vaccination

Evaluations of this type of interventions

COUNTRIES

• India

SETTINGS

• Middle class community clinics, slum clinics

TARGET POPULATIONS

• Pregnant women

VACCINES

• Influenza (maternal)

IMPACT

Significant increases in vaccine uptake (influenza) were observed following education of healthcare professionals in some settings (middle-class community clinics)

Further resources: Giduthuri 2019

PUBLIC PRIVATE PARTNERSHIPS

Determinants addressed: Opportunity (Access, affordability, availability, convenience, appeal, structural efficiency), **Motivation** (recommendation from HCP)

Possible interventions

Public private partnerships (PPPs) can be developed to provide primary healthcare and vaccinations

Evaluations of this type of interventions

COUNTRIES

• Pakistan

SETTINGS

• Non-specific

TARGET POPULATIONS

• Pregnant women

VACCINES

• Tetanus (maternal)

IMPACT

Significant increases in vaccine uptake (tetanus) were observed following the implementation of public private partnerships

Further resources: Imtiaz 2017

QUALITY IMPROVEMENT PRINCIPLES

Determinants addressed: Opportunity (Access, affordability, availability, convenience, appeal, structural efficiency), **Motivation** (recommendation from HCP)

Possible interventions

At a society level, quality improvement principles can be implemented in various healthcare settings. These can include different activities, such as provider and nurse education, standing order to empower nurses to vaccinate, new medical record forms...

Evaluations of this type of interventions

COUNTRIES

• Nepal

SETTINGS

• Hospital

TARGET POPULATIONS

• Adults discharged from hospital

VACCINES

• Pneumococcal

IMPACT

Significant increases in vaccine uptake (pneumococcal) were observed following the implementation of quality improvement principles

Further resources: Bock 2016

MULTI-COMPONENT INTERVENTIONS

MULTI LEVEL

Determinants addressed: All (depending on the type of interventions included)

Possible interventions

Multi-component interventions across different levels (e.g. individual, organisational, society) can be implemented, for example addressing the availability of vaccination doses, training of healthcare professionals on vaccination and vaccine-preventable diseases, and communication with target populations (e.g. daily health talks, information on vaccination)

Evaluations of this type of interventions

COUNTRIES

• South Africa

SETTINGS

• Antenatal clinics

TARGET POPULATIONS

• Pregnant women

VACCINES

• Influenza (maternal)

IMPACT

Increases in vaccine uptake (influenza) were observed following multi-component interventions (*significance levels not provided*)

Further resources: Bishop 2021

KEY FINDINGS & RECOMMENDATIONS

- Various barriers and drivers to adult vaccination uptake have been identified from existing VCP data, showing that adult vaccines such as COVID-19 are prone to public concerns about vaccine safety, importance and effectiveness as well as more contextual issues that will require long-term efforts to address such as mistrust of governments, new technologies or international organisations. More research should be conducted to synthesise past evidence on adult vaccination uptake, as this project mostly focused on existing VCP data.

- While models and frameworks such as the COM-B model are useful to synthesise information in a digestible way for policy-making and decisions, they sometimes fail to highlight important nuances and deeper issues associated with vaccine confidence. When used, they should therefore be complemented with relevant detailed thematic descriptions. Efforts to understand challenges with vaccine confidence and uptake should not be restricted to such models to prevent missing important issues not included in the models.

- High quality evidence on interventions to address barriers and drivers to adult vaccination uptake in Africa is currently lacking, with important gaps identified in the scientific literature. Further research to evaluate interventions at various levels of the socio-ecological model is therefore recommended in various African countries, as well as within countries to explore differences at various local and community levels.

- From existing evidence, various interventions at different levels (e.g. interpersonal, community, societal) can have positive effects on adult vaccines intentions and uptake, with activities focusing on communication showing encouraging results.