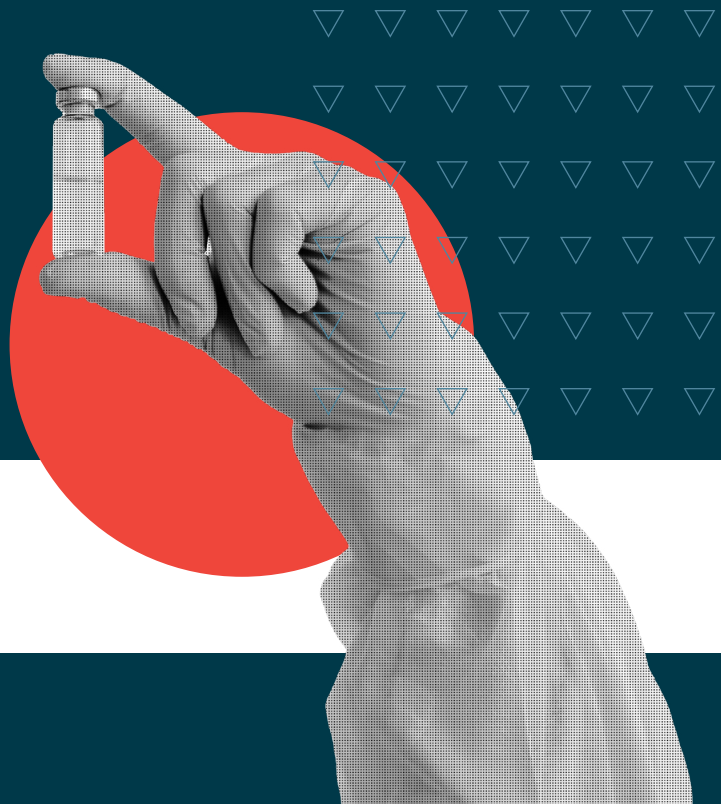
Dynamics of Vaccine Hesitancy:

A PRACTITIONER'S PLAYBOOK

Translating research into *actionable recommendations and tools* for public health practitioners to tackle vaccine hesitancy and non-intention.



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Lastly, we are grateful to our respondents for their time and for making it possible to do what we do.

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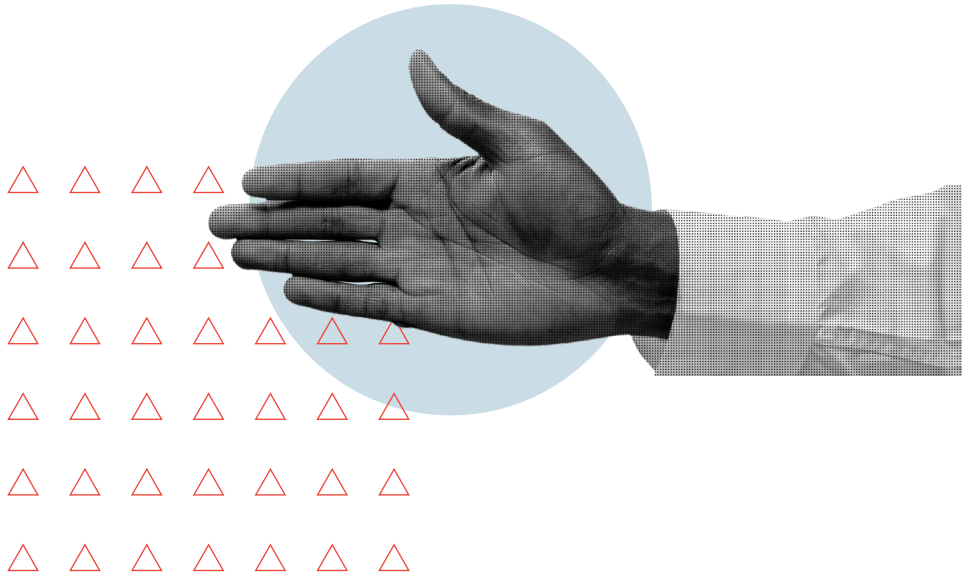

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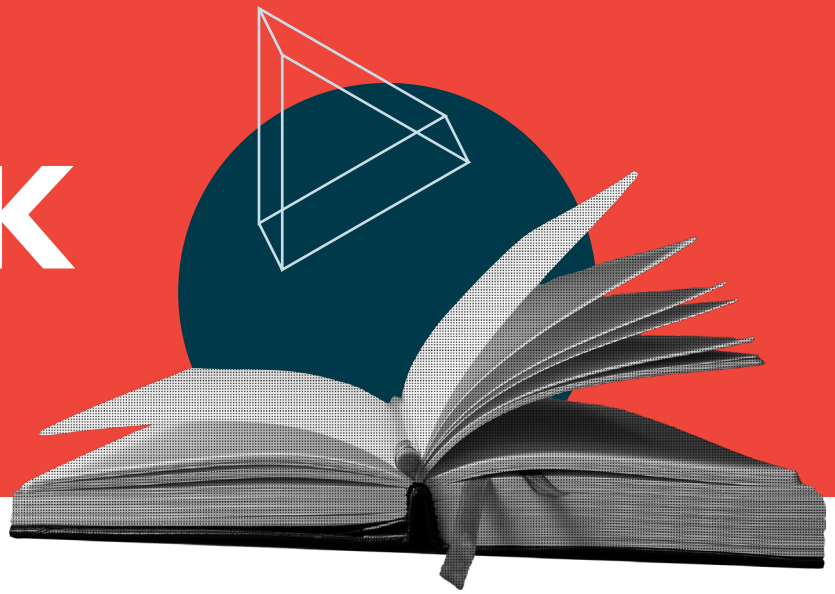

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THE DRIVE DEMAND PROJECT

PATH, with support from The Rockefeller Foundation, launched the Digital Results Improve Vaccine Equity and Demand (DRIVE Demand) project, a two-year, US$5 million partnership with PATH's Digital Square initiative to deploy and expand the use of digital health tools in Honduras, Mali, Tanzania, Thailand, Uganda, and Zambia. Through DRIVE Demand, the partners are aiming to help ministries of health utilize digital technologies to understand, track, and influence demand for immunizations. Ultimately, it will support target countries' effort to reach national COVID-19 and routine immunization targets, while strengthening data-driven health systems in Asia, the Caribbean, and sub-Saharan Africa.

DRIVE Demand is guided by The Rockefeller Foundation's approach to supporting iterative, country-driven efforts to increase demand for vaccination. This approach simultaneously addresses barriers to vaccination—such as access, trust, and information—that are often underestimated and misunderstood, while also leveraging digital and data tools to drive more effective and proactive vaccine interventions.

To this end, DRIVE Demand commissioned the Busara Center for Behavioral Economics (Busara) to conduct behavioral research in order to understand the barriers and drivers for routine vaccinations and COVID-19 vaccinations. Busara's research was designed to help inform the development and implementation of innovative and human centered design social behavior change (SBC) messaging optimized for mobile platforms to drive demand for vaccines in the target populations. This study leveraged insights from behavioral science in an attempt to increase the demand and uptake of routine vaccinations and COVID-19 vaccines. Core countries in this study included Mali, Tanzania, Uganda, and Zambia.

GLOBAL EFFORTS TO PROMOTE IMMUNIZATION UPTAKE

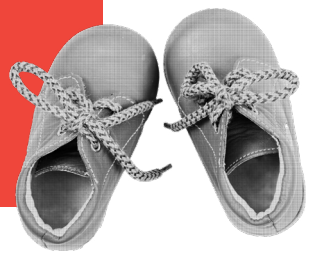
Immunizations are one of the most impactful and cost-effective public health interventions globally and have fundamentally altered our capacity to prevent and control infectious diseases (IHME, 2019; CDC, 2011). Global public health initiatives such as the Expanded Program on Immunization (EPI) by the World Health Organization (WHO) and the Global Alliance for Vaccines and Immunization (Gavi) have resulted in significant improvements in global life expectancy.

As a result, global incidences of vaccine-preventable diseases (VPDs) have steadily declined throughout the 21st century (IHME, 2019) and an estimated 2.5 million deaths are prevented each year among children under the age of 5 (CDC, 2011). Despite these improvements, VPDs remain one of the world's most pressing public health challenges due to pervasive vaccine hesitancy and low uptake.

Over the past decade, coverage of routine immunizations for children has plateaued. During COVID-19, nearly 25 million children lost out on life-saving vaccinations leaving them still unprotected from VPDs today (UNICEF Innocenti, 2023). Almost half of these children live on the African continent (World Health Organization, 2021). Annually, nearly all children who die from VPDs are from are from low and middle-income countries (LMICs). In 2018 alone, an estimated 99 percent of the 700,000 children who died from VPDs lived in LMICs (Frenkel, 2021).

2.5 million

deaths prevented each year among children under the age of 5



THE IMPORTANCE OF UNDERSTANDING VACCINE HESITANCY

A growing body of research from behavioral science indicates that individuals frequently do not act upon their preferences even if they have strong intentions to do so, and vaccination is no different. Individuals often do not prioritize vaccines because they do not see the long-term benefits, and instead focus on short-term costs and concerns about getting the vaccine. Behavioral science also indicates that it can be challenging to commit to doing something, and we often forget to do things we plan.

Low uptake of the HPV vaccine in parts of Africa is a pronounced example of this issue, wherein social cues and community beliefs prevent people from getting the vaccine in fear of what others might say. Behavioral science can play a leading role in understanding and addressing a range of psychological and social constraints to vaccination uptake.

Vaccine hesitancy describes the continuum between vaccine acceptance and vaccine refusal (Larson, H. J., et al., 2014), and recognizes that a person's journey from non-intention to intention and finally to action is highly-variable and discursive. Vaccine hesitancy is a critical area for investigation to understand how to reach the goal of increased immunization coverage (Butler, 2015; Frenkel, 2021; Schmid, et al., 2014; Feemster, 2020). Assessing the features of vaccine hesitancy can show us that the intention to be vaccinated and the behavioral outcome of vaccination is intimately related to context, and the antecedents of vaccination vary across time, place, and vaccine.

In selecting the population of the study, our research team theorized that the role of perceived barriers would likely mirror findings in the literature on vaccine hesitancy and construal-level theory and the multi-dimensional model of behavioral barriers (Chu, H., & Liu, S., 2023 and Gerend, M. A., Shepherd, M. A., & Shepherd, J. E., 2013). Our study population consisted of those who were not vaccinated against COVID-19 and had no intention of being vaccinated. Consequently, our team theorized that the salient barriers driving hesitancy presented by our participants were more likely to be psychologically distant, higher-order barriers to vaccination, such as vaccine safety and relevance, rather than psychologically immediate, lower-order barriers to vaccination, such as distance to the clinic or costs for transport.

TIMELINE OF OUR WORK

Step 1: Evidence review

To initiate our research, our team conducted an extensive literature review framed around the Capability, Opportunity, and Motivation (COM-B) model, which provides a systematic approach to understanding influence, behavior, and behavior change. "COM-B" respresents:

1

Capability

This refers to an individual's psychological and physical capacity to engage in a particular behavior, encompassing factors such as knowledge, cognitive abilities, and mobility.

2

Opportunity

This refers to the external factors that enable or hinder the occurrence of a behavior. It includes the physical, social and economic environment in which the desired behavior occurs. There are three sub-components of opportunity:

A. Physical opportunity refers to the availability of resources, time, and physical spaces required to perform a behavior.

B. Social opportunity relates to social and cultural factors such as social norms, social support, and social influence from others, that impact a desired behavior.

C. Economic opportunity includes financial and economic factors, such as cost, affordability, and accessibility of resources required to engage in a desired behavior.

3

Motivation

Motivation refers to reflective and automatic brain processes that drive behavior and decision-making. Reflective motivation involves conscious decision-making processes and beliefs about a behavior, such as attitudes, beliefs, intentions, and goal setting. Automatic motivation includes the unconscious or automatic processes influencing behavior, such as habits, impulses, emotions, and automatic responses. In our literature review, we examined reflective and automatic processes through the lens of risk perception, trust and credibility, agency, social influence and beliefs, and attitudes as they determine reflective and automatic decision making processes.

To apply the COM-B model, we defined specific sub-components influencing each of the individual nodes (capability, opportunity, and motivation). We mapped the findings of the literature to each sub-component of COM-B before conducting a synthesis of the literature under each one. By synthesizing findings within the COM-B framework, the literature review produced insights into viable strategies to enhance vaccine demand in the focus countries based on available evidence.

To read our evidence review, please visit: Barriers and Enablers: Behavioral Dynamics of COVID-19 Vaccinations in Low- and Middle-Income Countries.

Step 2: Study design

Using the framework and insights from our evidence review, the team worked to complete a qualitative design for our study. We designed our study around focus group discussions (FGD) with three participant groups: unvaccinated adults, unvaccinated pregnant women, and community health workers involved with immunization programming. In Mali, an additional FGD was conducted with adult parents or caretakers of children under the age of two years old.

We started by first reflecting on the literature to identify behavioral barriers influencing vaccine hesitancy and uptake. These barriers and related indicators are presented below:

Behavioral barrier	Indicators
Convenience	Inconvenience Travel Issues Long waiting times Access to vaccines

Behavioral barrier	Indicators
Priority and alternatives to vaccines	Not prioritized Hidden costs Daily income Time
Misinformation	Knowledge and attitude Lack of information Inaccurate information Uncertainty about the process
Risk perception	Risk balancing Side effects Risk of falling sick
Trust and credibility	Lack of trust and credibility Belief that vaccines are ineffective Belief that a second dose is unnecessary Lack of trusted sources of information
Agency and confidence	Agency, self efficacy, confidence Decision-making power
Social influence and community knowledge	Knowledge and attitude Lack of information Inaccurate information Uncertainty about the process
Beliefs and attitudes	Beliefs and values Alternative natural remedies Cultural beliefs Religious beliefs

We then developed a qualitative instrument, research protocol, and institutional research board (IRB) package to facilitate the FGDs in close collaboration with the DRIVE Demand team from PATH's Digital Square initiative. The protocol, tool, and IRB package was then submitted for ethics approval from national research ethics committees in each respective country of study.

Step 3: Focus group discussions

Our FGDs delved deep into the dynamics of vaccine hesitancy, with a specific emphasis on both COVID-19 and routine immunization. These discussions provided a rich platform for participants to express their beliefs, attitudes, concerns, and experiences related to vaccine acceptance and hesitancy. Through guided conversations facilitated by a trained moderator and a card sorting exercise, the FGDs allowed for exploring diverse perspectives across different demographic groups including variances in gender and age within the target populations.

The study team probed on themes such as trust in vaccines and healthcare systems, perceived risks and benefits of vaccination, cultural and societal influences, and information sources to uncover the underlying drivers of vaccine-related decision-making. Central to these questions were considerations of how, and to what extent digital tools impact the trust in or sharing of key messages that either hinder or enable vaccine acceptance. The interactive nature of FGDs fostered open dialogue, enabling participants to share personal experiences and insights, thus contributing to a comprehensive understanding of the factors that shape vaccine behavior.

A breakdown of our study sample is below:

Number of Participants per FGD					
Country	**Unvaccinated adults**	**Unvaccinated pregnant women**	**Parents of children aged 0 to 23 months**	**Community health workers**	**Total**
Mali	10	10	10	10	40
Tanzania	12	10	0	12	34
Uganda	14	10	0	11	35
Zambia	12	13	0	12	37
TOTAL	**48**	**43**	**10**	**45**	**146**

Each focus group consisted of three components. First, we asked participants to engage in a card sorting exercise wherein they ranked individual barriers from most to least important in relation to their decision to be vaccinated against COVID-19. Second, our team facilitated a structured FGD covering each aspect of the COM-B model. Third, we asked participants to engage in a collective ranking of the top barriers that influenced their decisions not to receive the COVID-19 vaccinations.

Step 4: Analysis and playbook development

Next, the team analyzed the qualitative insights from the FGDs and reflected on their implications for ministries of health and their implementing partners for optimal impact and reach of routine immunization campaigns and future pandemic preparedness and response.

The insights include country-specific findings and cross-country analyses of each respondent group and are organized in a research report available in Annex 3.

THE FUNCTION AND PURPOSE OF THIS PLAYBOOK

This playbook is the culmination of Busara's work under DRIVE Demand, created with the intention to ensure that the insights from this research translate into actionable recommendations and tools for ministries of health, public health practitioners, and health donors to tackle vaccine hesitancy and non-intention.

This playbook opens with an overview of our findings, framed around the Capability, Opportunity, and Motivation (COM-B) model for a systematic approach to understanding influence, behavior, and behavior change.[1] Using COM-B, we map key barriers affecting behavioral intention, as well as the facilitators of intention.

Next, the playbook provides an overview of our key market segments (groups of people who we believe represent different psychographic segments of vaccine hesitancy) based on our empirical, qualitative research: the **Vaccine Critic,** the **Deferential Actor,** and the **Disempowered Actor.** Each segment is defined through distinct behavioral archetypes accompanied by an assessment of the barriers, facilitators, and motivators related to vaccination intent.

Then, the playbook is positioned within a larger context of social and behavioral research on vaccine hesitancy and uptake, identifying where this playbook offers uniquely valuable insights.

Finally, the playbook provides a practical diagnostic framework for users to conduct segmentation on their own.

The diagnostic framework includes two components:

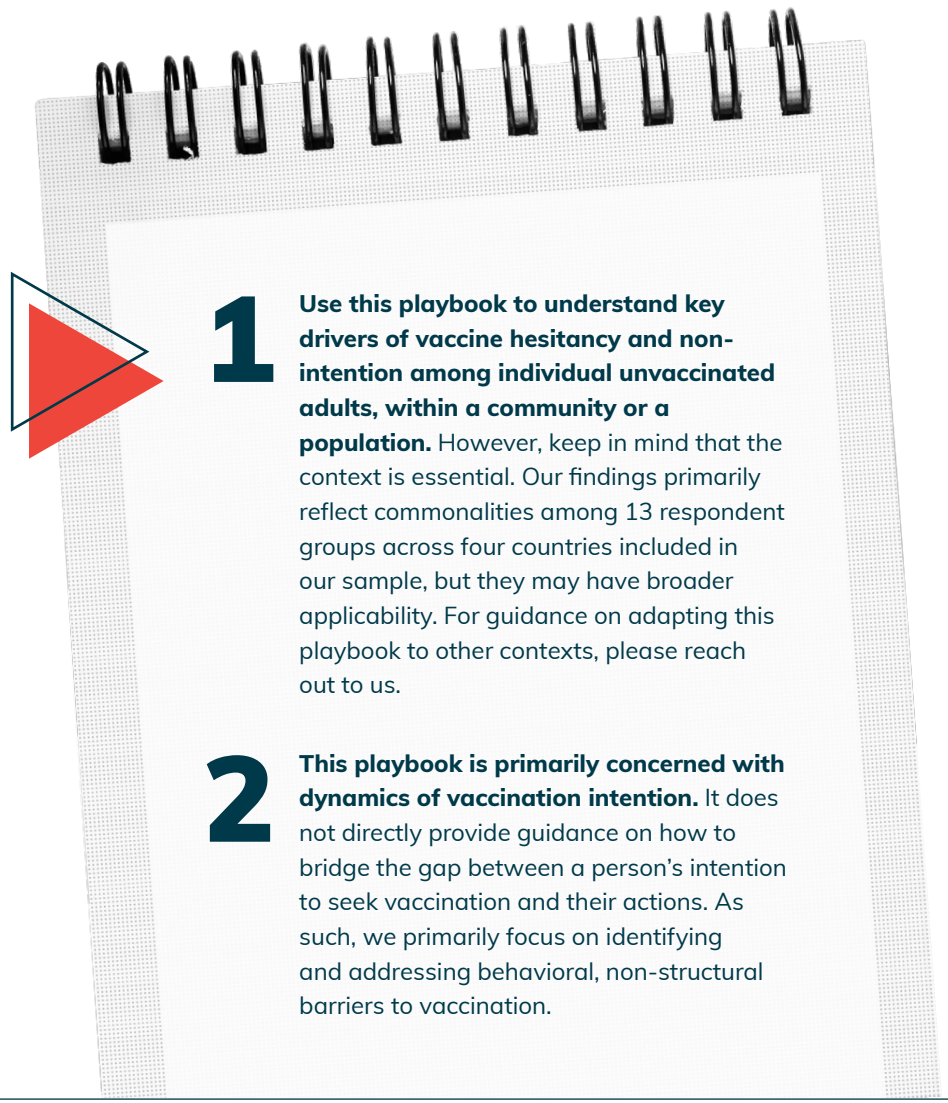
1 A 14-question ***Vaccine-Intention Questionnaire*** *(included as Annex 1).*

2 A ***Diagnostic Tool*** *(included in Annex 2) to help interpret the findings from the Vaccine-Intention Questionnaire.*

We envision users of this diagnostic tool integrating our 12-question questionnaire into a larger survey in order to quickly identify segments with low intention to vaccinate in a population.

1 Michie S., van Stralen, MM. West, R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implementation Science. 2011; 6(42). https://doi.org/10.1186/1748-5908-6-42

There are two important caveats to this playbook:



1 **Use this playbook to understand key drivers of vaccine hesitancy and non-intention among individual unvaccinated adults, within a community or a population.** However, keep in mind that the context is essential. Our findings primarily reflect commonalities among 13 respondent groups across four countries included in our sample, but they may have broader applicability. For guidance on adapting this playbook to other contexts, please reach out to us.

2 **This playbook is primarily concerned with dynamics of vaccination intention.** It does not directly provide guidance on how to bridge the gap between a person's intention to seek vaccination and their actions. As such, we primarily focus on identifying and addressing behavioral, non-structural barriers to vaccination.

HOW TO USE THIS PLAYBOOK

- **First,** you can review these findings and segments to understand the typical dimensions of vaccine hesitancy that influence the decision not to vaccinate and the cognitive factors to consider when developing a response that seeks to change or influence social behavior.
- **Second,** you can utilize this playbook's diagnostic framework to understand whether members of a community intend to vaccinate. You can use our screening tool on its own or as part of a larger survey to identify various segments of a population that could benefit from a new vaccine or a social behavior change campaign.
- **Third,** you can use the strategic guidance included to develop or support the development of evidence-based, SBC-informed messaging to help move beyond identified barriers and promote improved uptake of vaccinations against vaccine-preventable disease.

02 OVERVIEW OF BUSARA'S FINDINGS

Busara's findings from the DRIVE Demand project, which are devised from a thematic analysis of qualitative data from FGDs, contribute to broader research on vaccine hesitancy in several key ways.

Conceptually, vaccine hesitancy exists on a continuum between intention (vaccine acceptance) and non-intention (vaccine refusal). Our research under DRIVE Demand seeks to understand the behavioral dynamics of vaccination intention, rather than the behavioral dynamics of vaccine uptake behavior after intention is established.

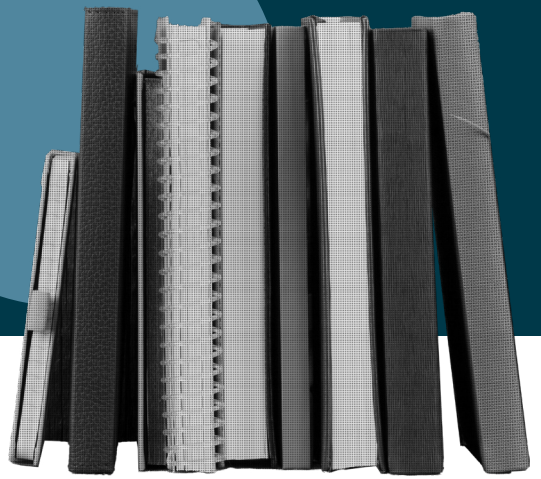
Second, our research contributes to literature examining the psychological distance of perceived barriers affecting vaccination intention and vaccination-seeking behavior. Our research found that for people possessing negative attitudes to vaccination, high-level and abstract barriers, such as global conspiracy theories, have greater relevance as opposed to immediate barriers, such as the accessibility of a vaccine or clinic. These findings are consistent with publications from a number of authors.[2]

However, our research also identified that intention among those who possess neutral or positive attitudes toward vaccination is influenced by proximate perceived barriers to opportunity for vaccination. Such barriers include social permission, vaccine availability, comfort and familiarity with health clinics, and the like.

Our takeaway is that creating intention is the key first step toward increasing vaccine uptake among vaccine-hesitant individuals. While structural barriers to accessing vaccines and vaccine information play a critical role in vaccine intent, the overlooked social, cultural, and interpersonal drivers of vaccine hesitancy are just as important. We intend for this playbook to be a useful toolkit for those working with vaccine-hesitant populations to better understand the dynamics of intention and help develop contextualized interventions to create intention among those who are resistant to vaccination.

2 Trope Y, Liberman N. Construal-level theory of psychological distance. Psychological Review. 2010;117(2):440–463. https://doi.org/10.1037/a0018963
Gerend MA, Shepherd MA, Shepherd JE. The multidimensional nature of perceived barriers: global versus practical barriers to HPV vaccination. Health Psychology. 2013;32(4):361–369. https://doi.org/10.1037/a0026248
Chu H, Liu S. Psychological distance, construal level, and parental vaccine hesitancy for COVID-19, HPV, and monkey pox vaccines. Science Communication. 2023;45(3):279–309. https://doi.org/10.1177/10755470231182614.

03 SEGMENTATION



SEGMENT 1: THE VACCINE CRITIC
SEGMENT 2: THE DEFERENTIAL ACTOR
SEGMENT 3: THE DISEMPOWERED ACTOR
DIAGNOSTIC FRAMEWORK

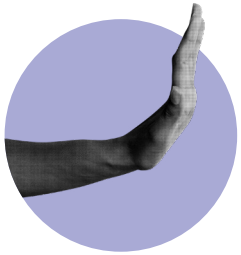
Our segmentation process

Segmentation is an important process of unpacking the behaviors of our sample respondents and distinguishing between different profiles of vaccine-hesitant people.

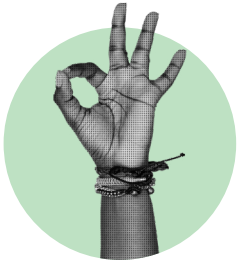
By distinguishing each segment from the others, we can describe different motivators, barriers, attitudes, and social influences that characterize each. We cannot design interventions for every individual, but we can organize interventions for each segment that support a desired behavior change; in this case, creating intention.

When considering the data from our study, three main population segments emerged. These segments differed based on two main characteristics. First, respondents differed in their attitudes and perspectives towards immunizations, with respondents fluctuating between three main states: negative, neutral, and positive. Second, respondents differed in their perceived opportunity to receive vaccination, with respondents fluctuating primarily between two states: negative and positive.

Therefore, we created three distinct segments of those who lack the intention to become vaccinated in the context of a pandemic:



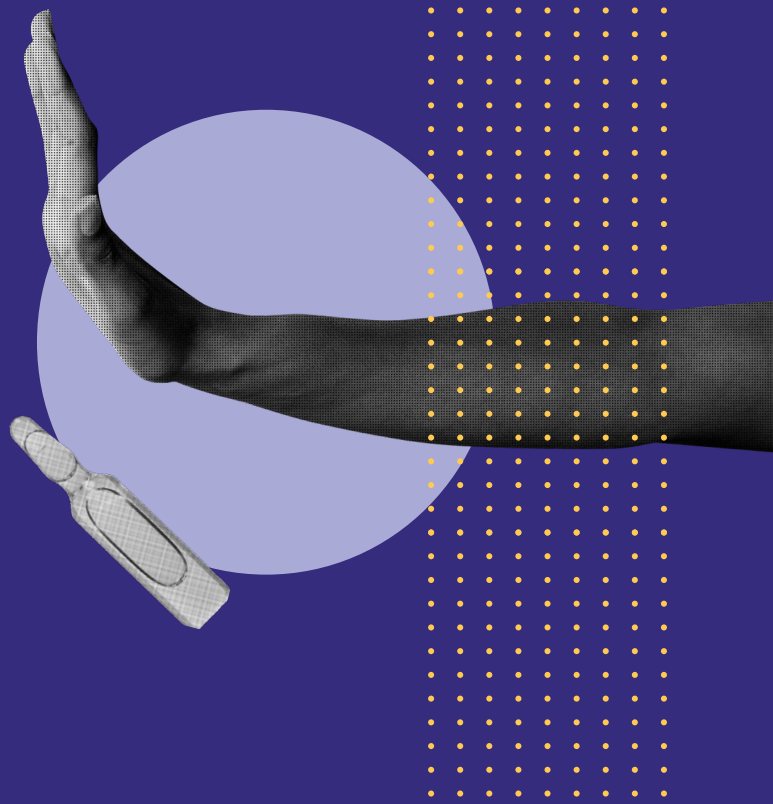
SEGMENT 1:
THE VACCINE CRITIC
Distinguished by strong negative attitudes and perceptions toward vaccination.



SEGMENT 2:
THE DEFERENTIAL ACTOR
Distinguished by neutral or positive attitudes towards vaccination and high or neutral perceived opportunity to be vaccinated.

SEGMENT 3:
THE DISEMPOWERED ACTOR
Distinguished by positive or neutral attitudes towards vaccination and low perceived opportunity to be vaccinated.

SEGMENT 1: THE VACCINE CRITIC



The Vaccine Critic segment is defined primarily by their distinct anti-vaccination perceptions and attitudes. The Vaccine Critic is primarily characterized by psychologically distant barriers to vaccination, such as global conspiracy theories, which speculate that the purpose of the vaccine is a mechanism for population control. These messages are often spread through interpersonal and online communications. As such, the level of opportunity they possess, whether physical or social, is not a factor influencing their intention to vaccinate.

Archetypes of the Vaccine Critic

The Vaccine Critic has two distinct archetypes, differentiated by their ability to access vaccination services.

1

Archetype
The Staunch Vaccine Critic

The Staunch Vaccine Critic possesses both negative vaccine perceptions coupled with a high opportunity to access and take the vaccine. They may have socially positive or neutral drivers providing an opportunity to receive a vaccine, however, they are negatively influenced by conspiracy theories and a distrust of specific immunizations. The Staunch Vaccine Critic possesses no intention to seek vaccination.

The Staunch Vaccine Critic likely experiences a number of barriers preventing adjustments to their beliefs and myth debunking: First, the Staunch Vaccine Critic may demonstrate **logical fallacies** that inconsistently process vaccine misinformation. Second, they may demonstrate **poor comprehension** of vaccine information coupled with **argumentative tendencies.** Third, they may demonstrate that attempts to debunk misinformation stand as a **threat to their worldview or identity.**

Attitudes towards Immunization

☹ **Negative**

Opportunity to take the Vaccine

▼ **Low**

Structural Barriers

Few to limited structural barriers on the intention for vaccination.

Behavioral Barriers

Psychological reactance, stemming from a feeling that their freedoms or identity are being threatened by pressures to take a vaccine.

Illusory truth effect, stemming from their repeated exposure to myths and misinformation on vaccines.

Loss aversion bias, wherein a person associates the potential loss of a negative side effect higher than the potential benefits of immunity.

False consensus effect, wherein a person may feel that their beliefs are true because they are shared by a majority of their community.

2 Archetype

The Disempowered Vaccine Critic

The Disempowered Vaccine Critic possesses negative perceptions of vaccination coupled with a low perceived opportunity to receive any vaccine. A combination of perceived structural and social barriers negatively affects their ability to seek vaccination. Their repeated exposure to misinformation about vaccines contributes to a tendency to view vaccines as unimportant or dangerous for their health.

The Disempowered Vaccine Critic change their intention for vaccination if they hear messaging from trusted local cultural or community voices and other public health authorities, along with digitally-sourced information specifically tailored to address common myths and misinformation regarding the safety of vaccination and outreach from community health services. They are likely influenced by a number of barriers, including the **false consensus effect, poor comprehension** and **logical fallacies.**

Their perceived opportunity for vaccination may be improved through clear, specific, and consistent communication from public health officials on the availability and location of vaccination services, as well as outreach programs promoting convenient vaccine accessibility. Additionally, their opportunity may be improved if public health social behavior change interventions target interpersonal networks such as household health decision-makers/heads, peer networks, and other socially important forums, such as religious associations, that may exert social pressure against remaining unvaccinated.

Attitudes towards immunization

☹ **Negative**

Opportunity to take the vaccine

▼ **Low**

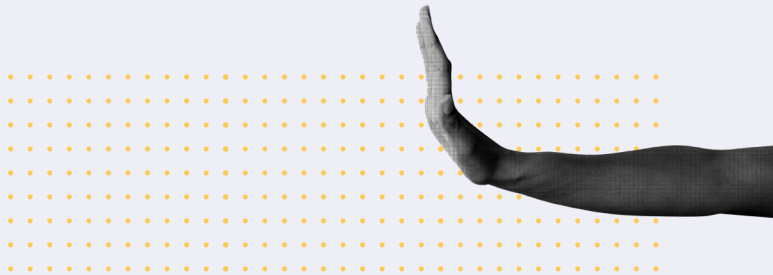
Structural barriers

Limited access to immunizations, driven by costs, distance to facilities, and other structural factors.

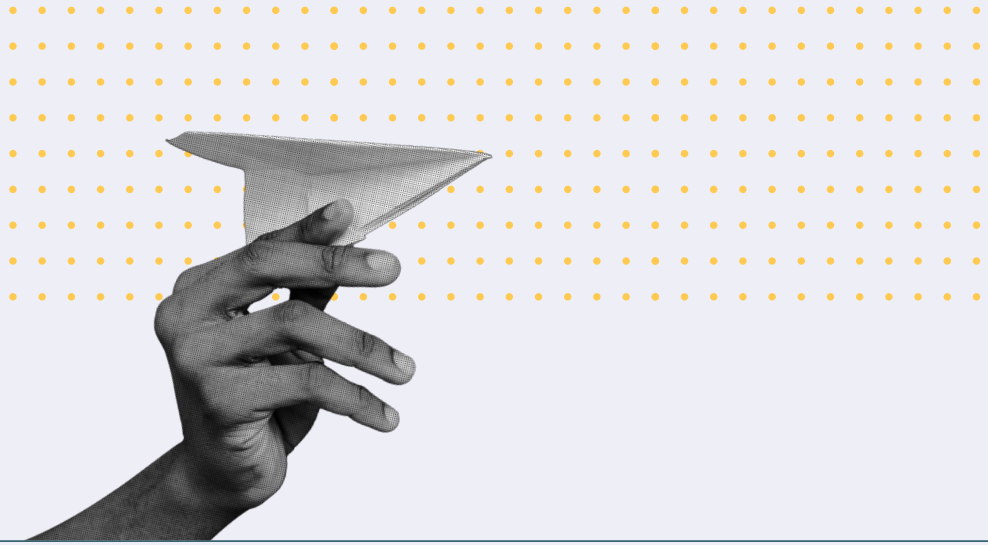
Behavioral barriers

Negative social influence affecting their agency or permission to seek vaccination services.

Illusory truth effect, stemming from their repeated exposure to myths and misinformation on vaccines.



Guidance for intention-creation in the Vaccine Critic segment

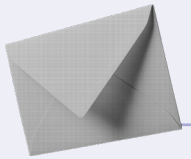


Barrier

Repeated exposure to myths and misinformation drives vaccine hesitancy and non-intention

The primary driver of the Vaccine Critic's lack of intention is linked to abstract vaccination myths and misinformation. For example, the Vaccine Critic may believe that the vaccine development process is unsafe or that the vaccine is experimental and untested.

Illusory truth effect: Repeated exposure to misinformation increases the likelihood that a person will believe it.



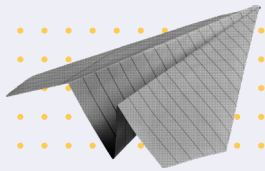
Solution

Pre-bunking and debunking myths

The messages on the next page are intended as examples, and any social behavior change communication intervention should be sure to contextualize messaging for appropriateness, relevance, and effectiveness.[3]

3 These barriers are sourced from literature on drivers of misinformation and its correction. See: Ecker et al. (2020).

Barrier to intention	Strategy to overcome barrier	Example message
Logical fallacy	Logic-based correction, coupled with clear visual presentation.	*99.999% of people experience no negative side effects after vaccination.*
Poor comprehension	Simple language, coupled with clear visual presentation.	*HPV vaccines do not affect fertility.* *COVID-19 vaccines are safe and effective.*
False consensus effect	Consensus messaging, coupled with norms-based messages.	*Experts agree that vaccines are the most promising way to stop the COVID-19 pandemic.*[4]
Perceived credibility of misinformation source	Trustworthy correction source, coupled with evidence to undermine the misinformation credibility.	*X% of doctors in [country/region] agree that this vaccine is safe and effective.*
Threat to worldview or identity	Identify affirming framing, coupled with world-view consonant framing.	*Economic considerations are important when discussing the impacts of remaining unvaccinated.* *Becoming vaccinated will reduce economic risks and create a stronger future for our country's economy.*

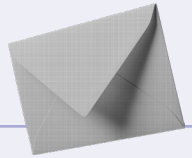


4 For guidance on social-norm messaging, please consult UNICEF's Vaccine Messaging Guide https://www.unicef.org/media/138031/file/Vaccine%20Messaging%20Guide.pdf

Barrier

Non-trusted sources in digital information channels

Vaccine Critics have access to a wide variety of information, both credible and non-credible, related to vaccines through digital sources. This access adversely impacts their ability to discern correct health-promoting information for decision-making, due to the Illusory truth effect.



Solution

Endorsements from trusted actors

The Vaccine Critic segment is a digitally engaged segment, making decisions based on information provided on digital platforms, such as X (formerly known as Twitter), Facebook, and Instagram. Solutions to reach this segment should include digitally-based messages that leverage trusted figures and alter the information environment to reduce exposure to misinformation.

Barrier to intention

Illusory truth effect

Strategy to overcome barrier

Social behavior change message framing: Trusted figures performing or endorsing the uptake of immunizations at the outset of a vaccine's introduction.

Search engine optimization: Ensuring that the online information that appears in search results promotes positive, fact-based articles on immunizations.

Behavioral insight

Leveraging authority bias: Identifying and recruiting key authority figures to drive uptake of vaccine information and services through digital platforms.

Anchoring: Ensuring that the first piece of vaccination information people are exposed to on vaccinations is positive and reinforces uptake.

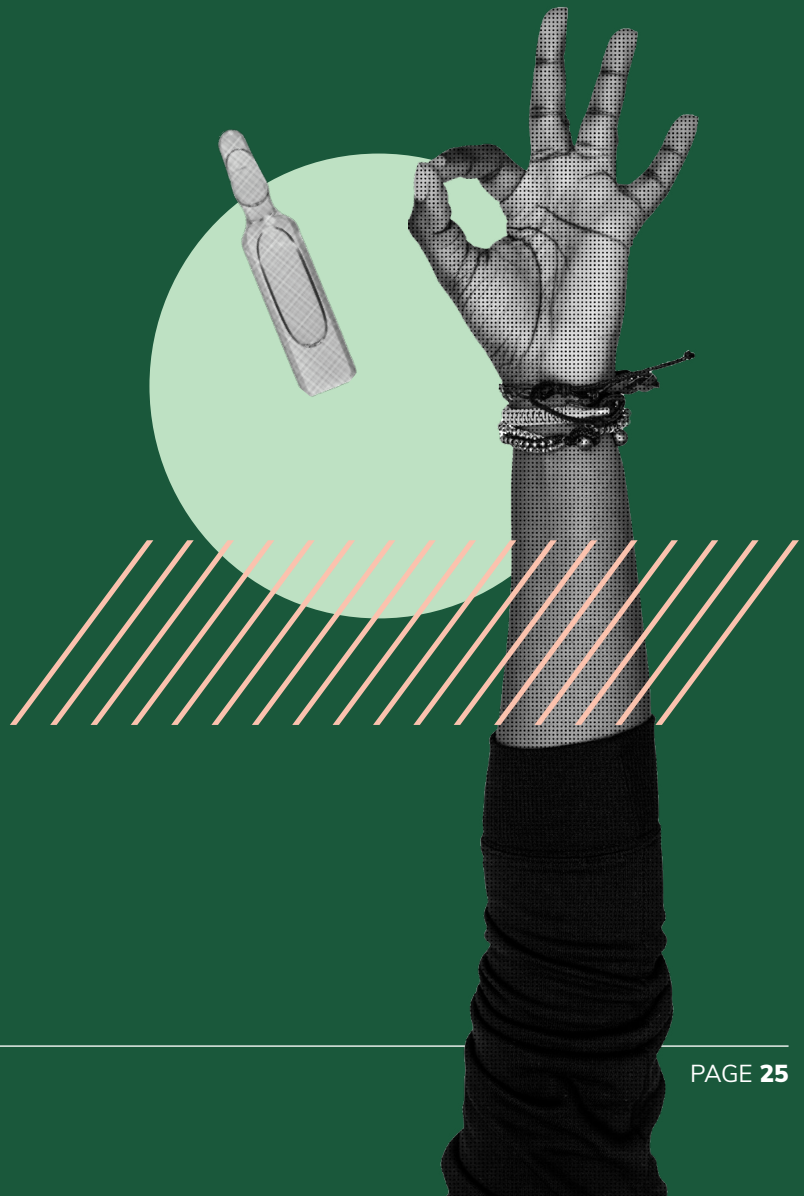
Example message

[Authority figure's name] has made the decision to vaccinate his family. What about you?

Do as our trusted leaders have done and protect yourself by getting vaccinated against COVID-19.

SEGMENT 2: THE DEFERENTIAL ACTOR

The Deferential Actor is defined primarily by their combination of non-intention coupled with neutral or positive attitudes toward vaccination and a high opportunity to access vaccination services. The Deferential Actor is subjected to a number of cognitive heuristics and biases that influence their non-intention to vaccinate, including cognitive overload, social conformity, and ambiguity bias; however, their neutral or positive attitudes toward vaccination suggest that they could be easily influenced to develop stronger intentions towards vaccination.



Archetypes of the Deferential Actor

The Deferential Actor has two distinct archetypes, differentiated by their ability to access vaccination services.

1

Archetype
The Apathetic Actor

The Apathetic Actor possesses neutral perceptions of vaccinations. They consider myths and misinformation that paint vaccinations as evil or harmful with skepticism. However, they consider their own risks of contracting a vaccine-preventable disease with similar apathy. The Apathetic Actor may not believe that the disease is a threat to them, or they may not believe that they will contract the disease at all. The Apathetic Actor possesses no intention to be vaccinated, despite ample opportunities that may exist to access such services.

The Apathetic Actor possesses social permission for vaccination, and vaccines are available to them. To inspire intention, therefore, SBC interventions should utilize social levers to inspire intention for vaccination.

Attitudes towards immunization

Neutral

Opportunity to take the vaccine

Neutral/High

Structural barriers

None to limited structural barriers exist, meaning that the Apathetic Actor has the capability of accessing immunizations.

Behavioral barriers

Negative social influence (negative interpersonal influences, misinformation).

Cognitive overload stemming from a confusing information ecosystem.

Ambiguity bias contributing to a lack of non-intention.

Status quo bias driving non-intention.

2 Archetype
The Constrained Deferential Actor

The Constrained Deferential Actor is defined by their neutral attitudes towards vaccination uptake coupled with low opportunity to access vaccination services due to structural or social constraints. Similar to the Apathetic Actor, the Constrained Deferential Actor views myths and misinformation on vaccines with skepticism. However, they possess or perceive a low opportunity to receive a vaccine.

For the Constrained Deferential Actor, perceived social permission and agency to make their own health decisions, as well as perceived structural barriers, jointly influence their intention to seek vaccination. As such, efforts to promote vaccination intention of this archetype should aim at identifying and reducing social barriers and lean on cognitive mechanisms that grant social permission to seek immunizations, coupled with interventions that may remove any structural challenges that may further inhibit intention.

Attitudes towards immunization

😐 **Neutral**

Opportunity to take the vaccine

▼ **Low**

Structural barriers

Accessibility issues (distance, queues, restrictive scheduling).

Inadequate resources (staff, facilities).

Cost barriers (hidden costs, productivity losses).

Behavioral barriers

Negative social influence (negative interpersonal influences, misinformation).

Lack of perceived agency to make health decisions.

Cognitive overload stemming from a confusing information ecosystem.

Ambiguity bias contributing to a lack of non-intention.

Status quo bias driving non-intention.

Guidance for intention-creation in the Deferential Actor segment

Both the Apathetic Actor and the Constrained Deferential Actor possess neutral attitudes to vaccination and both are generally skeptical of myths and misinformation on vaccines. It is likely that both archetypes of the deferential segment suffer from cognitive overload. A confusing ecosystem has undermined their motivation to make decisions on vaccination, thus leading to a **status quo bias.** The Deferential Segment may also defer to more **traditional remedies** as an alternative to vaccination. As such, the Deferential Actor segment is most susceptible to intention-creation through messaging that leverages **social norms, social conformity, and authority figures.**

However, the Constrained Deferential Actor may also have their intention undermined by their perceived lack of opportunity to access a vaccination.

The Constrained Deferential Actor may not possess the agency to make a health decision or has given that decision to another person in their household or immediate social group. The Constrained Deferential Actor may also perceive that the process of accessing a vaccine is unclear or that the facilities where vaccinations are provided are uncomfortable or unfriendly.

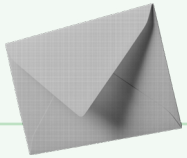
Therefore, the Constrained Deferential Actor may benefit from social behavior change interventions that **target decision-makers** in their household or immediate social group. Intention may also be created when the **vaccination process is described in plain language** and when **accommodations are made to improve their experience accessing health services.**

Barrier

Belief in traditional remedies and low perception of risk

Perception: COVID-19 or another vaccine-preventable disease is not serious and presents as a common cold or another mild illness.

Belief: Traditional medicine is enough to prevent COVID-19 or another vaccine-preventable disease.



Solution

Reframing the relationship between vaccine and traditional remedy

Barrier to intention

Appeal to nature fallacy

Strategy to overcome barrier

Social behavior change message framing: Messages should enable framing of vaccines and natural remedies as complementary to each other and not as substitutes.

Behavioral insight

Framing effect: How information is presented is critical to how people interpret it.

Cultural health norms: Making positive associations between vaccinations and traditional remedies can help decrease biases around vaccines.

Example message

The vaccine reduces the severity of the virus, and traditional remedies help with mild symptoms.

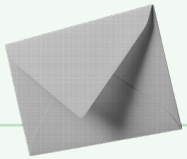
Choosing to take vaccines to protect against the virus does not mean that you can't take the natural remedies to feel better. Speak to a doctor to learn more.

Barrier

Confusing and conflicting information

Cognitive overload: Confusing and conflicting information is overwhelming and increases both skepticism and indecision.

Status quo bias: People defer to the status quo, non-vaccination, without adequate nudges to promote acceptance, intention, and decision-making.



Solution

Integrate COVID-19 vaccines with routine immunizations

Barrier to intention

Status quo bias

Strategy to overcome barrier

Social behavior change message framing: Messages should shift the perspective of the Deferential Actor to associate COVID-19 vaccination with routine immunizations.

Behavioral insight

Salience: Make the benefits of COVID-19 vaccine salient by associating it with routine vaccines.

Creating cognitive dissonance: To solve the mental unease from trying to reconcile positive views on vaccines in general with doubts about the COVID-19 vaccine specifically, people may adjust their views on the COVID-19 vaccine.

Example message

The Polio vaccine is a powerful tool to protect your children and family, so are COVID-19 vaccines.

As we prioritize our children's health, let's stay up to date with all vaccinations to give our children the best defense against diseases, including measles and COVID-19.

Barrier to intention

Friction/hassle factors associated with accessing both immunization and COVID-19 vaccine services

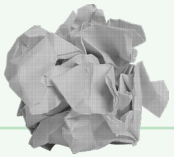
Strategy to overcome barrier

Social behavior change intervention for motivation: Integrate high-priority vaccinations into routine immunization services by providing them together and **listing the high-priority vaccine on a vaccination card** or similar product.

Behavioral insight

Reducing friction: Make it available at the facilities people already visit to make it easy for understanding, intention and uptake.

Automatic motivation: Make the high-priority vaccine an automatic decision by listing it on a vaccination card or schedule.

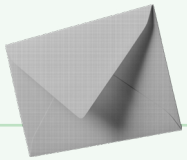


Barrier

Low trust in vaccinations and high fear of side effects

Risk and uncertainty aversion: Fear of severe side effects and unpredictable long-term impacts.

Low trust: Safety for use given a short vaccine development period.



Solution

Leverage social proofing to build positive narratives around vaccination

Share video, audio, and text testimonies from trusted sources and people Deferential Actors can relate to on the common digital platforms used by this segment.

Barrier to intention

Poor social proofing of vaccine safety and uptake

Strategy to overcome barrier

Social behavioral change message framing: Normative integrated messaging that frame vaccine uptake as a culturally or socially accepted practice to encourage social conformity.

Behavioral insight

Social conformity: Present video-pictorial, and text-based testimonials and messaging that frame vaccination as a behavior practiced by individuals similar to those in the segment.

Normative messaging: Support vaccine uptake with messages that provide factual information about vaccine norms to encourage intent for and uptake of vaccination.

Example message

60% of people in youths between 18 and 24 years in your community agree that vaccines are effective at preventing diseases.

Did you know over 70% of people in [community name] have received their COVID-19 vaccination. Have you?

Barrier to intention

Poor social proofing of vaccine safety and uptake

Strategy to overcome barrier

Utilize digital channels for wide-scale dissemination: Use public forums and digital platforms, such as Tiktok, Instagram, Facebook, SMS, and WhatsApp messages or broadcasts, to address personalized, direct questions in a manner that is easy to understand, relevant, and relatable.

Behavioral insight

Salience: For ease of understanding, communication and messages should be provided in concise, unambiguous, and simple statements for the target segment.

Convenience: Easily accessible digital tools and channels with high user counts and engagements should be targeted primarily for dissemination.

Barrier to intention

Negative social influences spread misinformation

Strategy to overcome barrier

Social behavioral change message framing: Disseminate credible vaccine information and online testimonials from trusted pro-vaccination influencers, such as local or religious leaders, social media influencers, etc. These could be leveraged through message blurbs, status updates, broadcasts, and live video streams of their vaccination experiences.

Behavioral insight

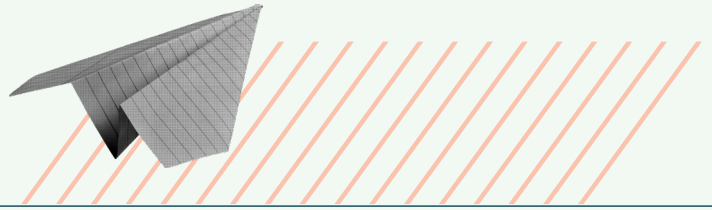
Messenger effect: People judge the credibility, relevance, and validity of information based on its source.

Example message

Two day after the vaccine and [influencer's name] is back to work.

Join [influencer's name] live as they get their COVID-19 vaccination.

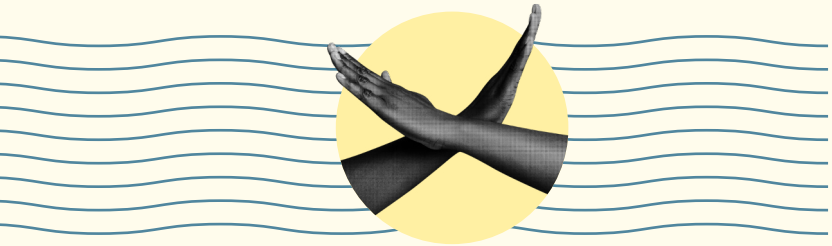
Watch as [leader's name] takes his children for their routine immunization. Prevention is better than cure.



SEGMENT 3: THE DISEMPOWERED ACTOR

The Disempowered Actor is defined by their combination of low opportunity to access vaccination services and their positive attitudes and perceptions of immunizations. Perceived structural or social constraints may inhibit the opportunity of the Disempowered Actor to make their own decisions regarding whether or not to access vaccination services, and as a result, they do not have any intention to do so.

Archetypes of the Disempowered Actor



The Disempowered Actor has one distinct persona:

1 Archetype
The Disempowered Actor

The Disempowered Actor possesses a low opportunity to access immunizations services, despite their generally postive attitude towards immunizations. The Disempowered Actor does not perceive having the opportunity for vaccination, and therefore possesses no intention for getting vaccinated.

Attitudes towards immunization

Positive

Opportunity to take the vaccine

Low

Structural barriers

Accessibility issues (distance, queues, restrictive scheduling).

Inadequate resources (staff, facilities).

Cost barriers (hidden costs, productivity losses).

Behavioral barriers

Negative social influence and low decision-making agency.

Guidance for intention-creation in the Disempowered Actor segment

The Disempowered Actor segment perceives that they possess very little opportunity to access immunizations and, as a result, requires investments to be made that support their opportunity to make the decision to access immunizations. These investments may be categorized into two distinct approaches: First, intention-creation for the Disempowered Actor may be achieved by interventions that frame **vaccination as a social norm.** For example, by influencing the perspectives and opinions of authority makers and household health seeking decision makers.

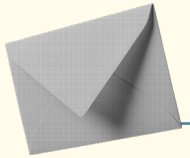
Second, intention-creation for the Disempowered Actor may be achieved by understanding and removing perceived structural barriers for vaccination. Perceived structural barriers will vary by context and should be thoroughly investigated by primary research in context. General interventions should explore **explaining the vaccination process in plain language** and **ensuring accommodations are made to improve their health service experience.**

Barrier

Male household heads have more decision making power than others

Limited agency: Women and other members of the household may wish to seek vaccinations, but are not the ultimate decision-makers of health behavior.

Gender norms: Gender norms may promote the male household head as the primary decision-maker, over women or other members of the household.



Solution

Targeted SBC for male household heads

Solutions should design interventions that appeal to male household decision-makers.

Barrier to intention

Influence of authority bias on the behaviors of household leaders

Strategy to overcome barrier

Messages and online testimonials from influential public figures, such as sportsmen, religious leaders, or celebrities, who are admired by male household heads promoting vaccinations.

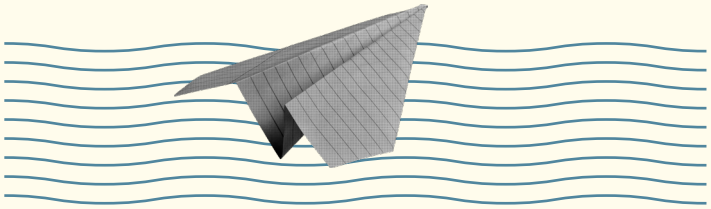
Behavioral insight

Leveraging authority bias: Male household heads are more likely to accept information if it comes from authority figures.

Example message

[Authority figure's name] has made the decision to vaccinate his family. What about you?

Do as our trusted leaders have done and protect yourself by getting vaccinated against COVID-19.



Barrier to intention

Social influence and identity

Strategy to overcome barrier

Messaging emphasizing that vaccination is closely linked with positive aspects of identity.

Behavioral insight

Identity priming: Influence someone's behavior by emphasizing their belonging to a certain group or being a certain type of person, in this case the role of a father. This intervention achieves this by using an influential male figure to leverage the identity of a "responsible father."

Example message

As a responsible father, I got my child vaccinated and you should too.

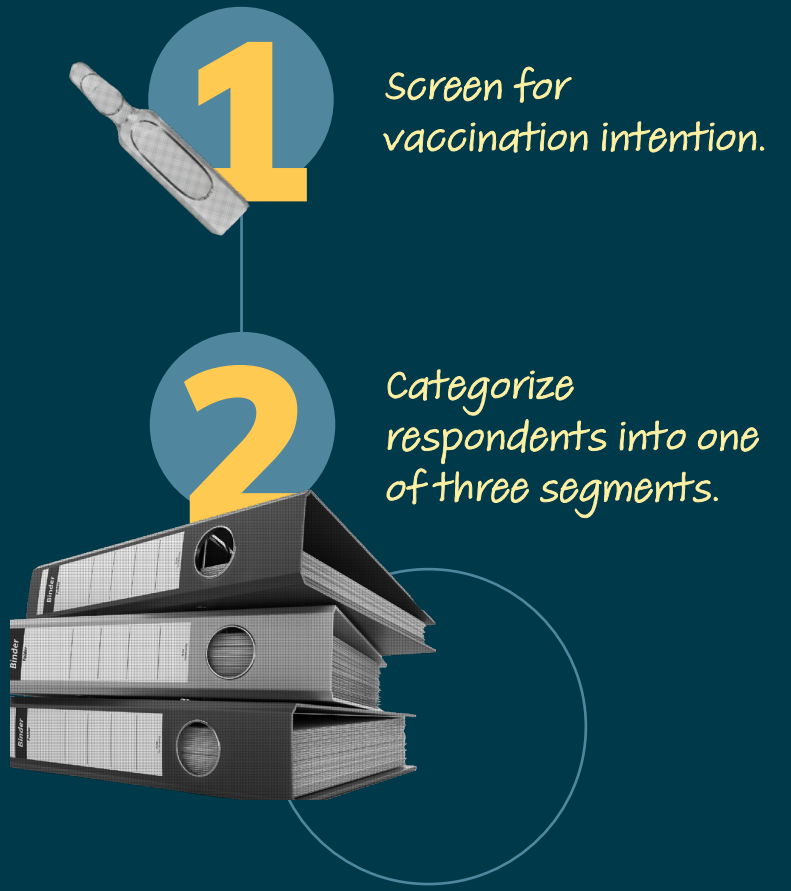
I am a wise father who takes steps to protect my children's futures by getting them vaccinated.

Strong men protect their families and communities when they get their children vaccinated.

DIAGNOSTIC FRAMEWORK

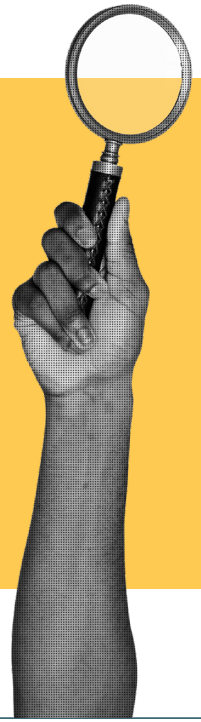
Our segments provide a general understanding of different types of people who lack intention for vaccination, as well as all related guidance for interventions that may create intention for each segment.

To help apply this guidance, we have created a diagnostic questionnaire that enables researchers and public health practitioners to:



What is included in this framework?

Our diagnostic framework is composed of two elements:



1 *A 14-question **Vaccine-Intention Questionnaire** (included as Annex 1).*

2 *A **Diagnostic Tool** (included in Annex 2) to help interpret the findings from the Vaccine-Intention Questionnaire.*

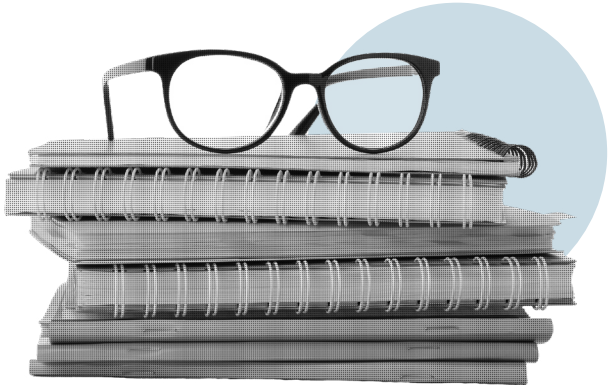
How to use our diagnostic framework

Our diagnostic framework is easy to use and can be applied over four basic steps:

- **Step 1: Select the vaccination intention to test for.** First, you should decide which vaccine you would like to screen for. You should consider inputting a single vaccine that you would like to measure intention for or refer instead to vaccines in general.
- **Step 2: Contextualization.** To povide context for the questionnaire, translate its questions into a relevant language, and pilot the questionnaire to ensure that the questions are well understood by your audience.
- **Step 3: Survey administration.** Administer our questionnaire on its own or integrated into a larger research exercise.
- **Step 4: Utilize our diagnostic tool.** Input your questionnaire responses into our diagnostic tool.

Logic of our diagnostic framework

To develop this diagnostic framework, we have adapted a validated measure to assess respondent attitudes toward vaccines and respondent perceptions of vaccination opportunity within the context of non-intention.



Matrix of segments

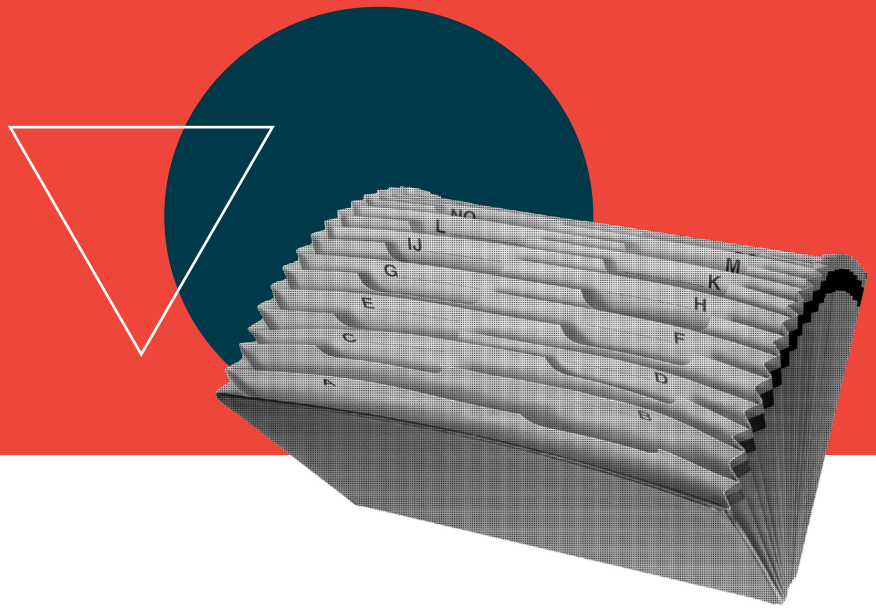
Responses from our questionnaire have been further categorized into three distinct attitude categories and three opportunity categories, as shown in the matrix below.

	Opportunity		
Attitudes	▼ **Low**	▶ **Neutral**	▲ **High**
☹ **Negative**	Vaccine Critic	Vaccine Critic	Vaccine Critic
😐 **Neutral**	The Disempowered Actor	The Deferential Actor	The Deferential Actor
☺ **Positive**	The Disempowered Actor	The Deferential Actor	The Deferential Actor

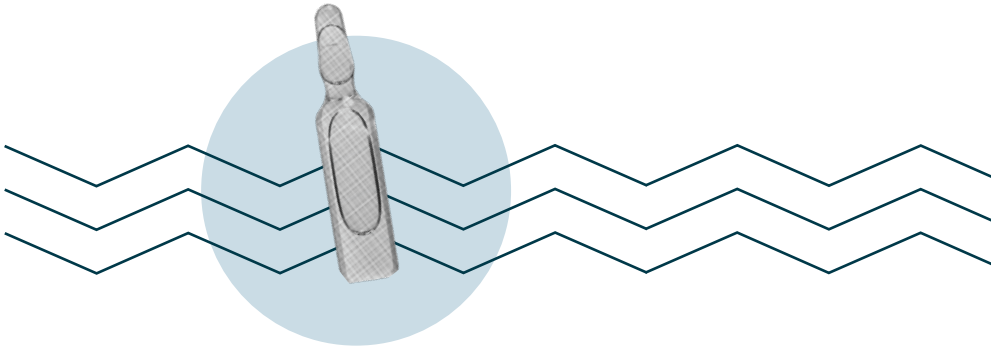
Index creation

Our questionnaire uses Likert-scale questions ranked from 1 to 7 to capture attitudes toward vaccinations and perceived opportunity to seek vaccinations. Based on the responses, we have developed an index to classify respondent scores into our three segments. Each segment is identified by predefined thresholds that correspond to negative, neutral, and positive attitudes, as well as low, neutral, and high opportunities. This classification system enables us to group individuals as Vaccine Critics, Disempowered Actors, or Deferential Actors.

04 ANNEXES



ANNEX 1: VACCINE-INTENTION QUESTIONNAIRE



Instructions

To use this questionnaire, you should follow these steps:

- **Step 1:** Decide which vaccine you would like to screen for. Where the questionnaire denotes, [the vaccine], you should consider inputting a single vaccine that you would like to measure intention for or refer instead to vaccines in general.
- **Step 2:** Translate this questionnaire into a relevant language for your audience and conduct a pilot testing of the questionnaire to ensure that it is well understood by your target audience.
- **Step 3:** Administer this questionnaire either on its own or as part of a larger research exercise.[5]
- **Step 4:** Input your findings into our diagnostic tool (Annex 2).

5 After following all relevant organizational and national ethics and Institutional Review Board (IRB) protocols to receive approval to conduct such vaccination intentionality screening, if a part of the research.

Questionnaire

Code	Screening for intention	Response options	Skip logic
Int_1	Have you received [the vaccine]?	1. Yes 2. No	If 1, "Yes", end survey
Int_2	Do you intend on receiving [the vaccine]?	1. Yes 2. No 3. I don't know	If 1, "Yes", end survey

For the following statements, indicate how much you agree or disagree using the 7-point scale:

1 - Strongly disagree

2 - Moderately disagree

3 - Slightly disagree

4 - Neutral

5 - Slightly agree

6 - Moderately agree

7 - Strongly agree

(R) denotes reverse coding, where 1 corresponds to "Strongly agree" and 7 corresponds to "Strongly disagree."

Code	Attitudes towards [vaccine]	Responses	Code	Opportunity	Responses
Att_1	I am completely confident that vaccinations are safe.	1 2 3 4 5 6 7	**Opp_1**	When everyone is vaccinated, I don't have to get vaccinated too. (R)	1 2 3 4 5 6 7
Att_2	Vaccinations are effective in preventing diseases.	1 2 3 4 5 6 7	**Opp_2**	I get vaccinated because I can also protect people with a weaker immune system.	1 2 3 4 5 6 7
Att_3	Regarding vaccines, I am confident that public authorities decide in the best interest of the community.	1 2 3 4 5 6 7	**Opp_3**	Vaccination is a collective action to prevent the spread of disease.	1 2 3 4 5 6 7
Att_4	Vaccinations are unnecessary because vaccine-preventable diseases are not common.	1 2 3 4 5 6 7	**Opp_4**	Everyday stress prevents me from getting vaccinated.	1 2 3 4 5 6 7
Att_5	My immune system is so strong, it also protects me against diseases.	1 2 3 4 5 6 7	**Opp_5**	For me, it is inconvenient to receive vaccinations.	1 2 3 4 5 6 7
Att_6	Vaccine-preventable diseases are not so severe that I should get vaccinated.	1 2 3 4 5 6 7	**Opp_6**	Visiting the doctor makes me feel uncomfortable. This keeps me from getting vaccinated.	1 2 3 4 5 6 7

ANNEX 2: DIAGNOSTIC TOOL

Our diagnostic tool is available here:

Diagnostic Tool V1_24.5.23

ANNEX 3: BARRIERS AND FACILITATORS OF INTENTION

Based on empirical research conducted by Busara under the DRIVE Demand project in Mali, Tanzania, Uganda, and Zambia, a number of barriers and facilitators influencing the intention of participants to vaccinate are identified below. The select quotes included here are derived from focus group discussions (FGDs) conducted in each country with the defined key populations. **See here** for the full country findings from the study.

COM-B Category

Capability

Barriers to vaccination intention

- Limited access to credible sources of vaccination information.
- Knowledge gaps and misconceptions about vaccines.
- Limited digital literacy and need for verification of information.

Selected quotes

Social networks, particularly Facebook, are the most untrustworthy sources of information in my community because nobody comes with the news. Instead, everyone writes it themselves. It is unclear where the news originated. Others may have written it because they found it humorous, but people are taking it as fact.

- Participant 10, Unvaccinated Adult, Tanzania

In my community, especially in old Shikoswe Zone…a lot of people refuse to receive the COVID-19 vaccine because there isn't much sensitization on the COVID-19 vaccine. Sensitization may have been done but you find that some people were away while it was going on. So, there should be enough time…to explain to them carefully. For instance, some people know [sic] that once you are given the COVID-19 booster, then you will die within a few months.

- Participant 2, Community Health Worker, Zambia

COM-B Category

Opportunity

Barriers to vaccination intention

- Social influence (negative interpersonal influences, misinformation).
- Lack or limited autonomy to make health decisions.
- Accessibility issues (distance, queues, restrictive scheduling).
- Inadequate resources (limited staff, inadequate vaccine supply, limited infrastructure at facilities, i.e., cold storage).

Selected quotes

I cannot take my children for immunization, be it COVID-19 vaccination, because I really fear—even those I saw being vaccinated for COVID-19, they were not doing well.

- Participant 6, Unvaccinated Pregnant Women, Uganda

The fact is we get tired. You find health center facilities like Health Center IIs have few health workers, yet other activities have to continue. You have to attend to the outpatient department, family planning…make sure immunization is in place, antenatal. And you also have to go to the outreaches you selected to vaccinate children.

- Participant 3, Community Health Worker, Uganda

COM-B Category

Motivation

Barriers to vaccination intention

- Fear and distrust (concerns about side effects, vaccine authenticity).
- Misinformation (false claims, conspiracy theories) about the side effects of vaccines.
- Low perceived risk of infection or illness and necessity of the vaccine (questions about vaccine necessity, perceived risk).
- Cultural and traditional beliefs (conflicts with traditional remedies, cultural misconceptions).

Selected quotes

Some people say that if I take my child to get vaccinations, it will cause harm, so he is ready not to give the child vaccinations because of the fear of the effects of those vaccines on children.

- Participant 6, Unvaccinated Pregnant Woman, Tanzania

Most people say immunizing children is not good because in most cases the government puts in place general immunization against children, and after almost all children have received the immunization the same government makes an announcement how [sic] the vaccine had an issue. That's why many people in my community do not allow their children to be immunized.

- Participant 9, Unvaccinated Pregnant Woman, Uganda

People are complaining about doctors stopping them from using herbs on their children. For example the vaccines injected on the thighs, doctors refuse people from using an onion to stop the thigh from swelling, yet people believe it works. That has made many people to stop immunizing their children because they are not being sensitized enough.

- Participant 3, Unvaccinated Adult, Uganda

This is what is said in the grins [sic], because there everyone says what suits them, whether it is true or false. Information about the vaccine from these sources is unreliable. These sources should not be trusted.

- Participant 9, Unvaccinated Pregnant Woman, Mali

COM-B Category

Capability

Facilitators of vaccination intention

- Trust in authorities such as the ministry of health and governments.
- Ability to understand the benefits of taking up the COVID-19 vaccine.
- Previous positive experiences with other types of vaccines.
- Capacity-building sessions with community health workers (CHW).

Selected quotes

For me, a vaccine prevents a disease. Even if you don't have it, it can help kill or reduce viruses that live in our bodies. The presence of viruses in the body makes you sick. This is an important measure to protect your health and promote good physical development.

- Participant 6, Unvaccinated Adult, Mali

If the information comes from the village chief or the imam to encourage people to come and get vaccinated, I will accept.

- Participant 6, Unvaccinated Adult, Mali

COM-B Category

Opportunity

Facilitators of vaccination intention

- Convenient access to vaccines in the different health centers.
- Positive attitudes towards vaccination services by community and immediate social groups.
- Autonomy in vaccine decision-making for oneself and family.
- Positive peer pressure to vaccinate arising from positive experiences depicted by vaccinated individuals.
- Improving visibility of vaccination services and vaccine uptake among peers.

Selected quotes

Nowadays, the community perceives vaccination better better than before. If we talk about vaccination, and the information is disseminated where it is needed, especially if it comes from television, radio, and health workers who go into the community, that is enough to encourage parents to bring their children. Even in the past campaign, awareness was broadcast on television and many people came out to get vaccinated. The truth is, people are buying into it more now than ever before.

- Participant 3, Parent of Child under 24 months, Mali

The decisions are the same on all vaccines I am the one who decides, and I can't be decided by someone else on the issue of vaccines.

- Participant 8, Unvaccinated Pregnant Woman, Tanzania

COM-B Category

Motivation

Facilitators of vaccination intention

- Fear of a vaccine-preventable disease.
- Proper education received on the benefits of COVID-19 vaccine.
- Fear of losing jobs or not traveling due to government restrictions and mandates.

Selected quotes

In our health center, no one was forced, but fortunately or unfortunately, when COVID-19 came in, the administrator of our health centers got very sick. So after seeing all the signs and symptoms of COVID-19 and treating them, everyone was vaccinated.

- Participant 11, Unvaccinated Adults, Tanzania

So, when someone gets the vaccine, they would say I got the vaccine and nothing has happened. Others would start getting vaccinated after receiving information from the clinic.

- Participant 7, Community Health Worker, Zambia

It was a must if you don't have a COVID-19 vaccination card, you don't access payroll. So to some people it was forceful.

- Participant 2, Community Health Worker, Uganda

ANNEX 4: SUMMARY OF KEY COGNITIVE MECHANISMS FOUND

Our researchers observed a number of similar critical cognitive mechanisms across our respondent countries that are important to keep in mind when designing interventions for intention-creation.

Capability

Cognitive bias/insight	Definition	Examples from the data
Ambiguity bias	The tendency of people to avoid options or decisions that we consider to be ambiguous or have incomplete or missing information about.	Across all countries, vaccine-hesitant CHWs were mistrustful of the quality control measures taken for the COVID-19 vaccine. There was uncertainty about the expedited development and roll-out of the COVID-19 vaccine given the urgency of the pandemic.
Anchoring	The tendency to rely on the first piece of information one is exposed to when making decisions.	In Uganda, vaccine-hesitant CHWs were reportedly anchored on pre-existing local conspiratory beliefs about the underlying motivations of governmental and health actors providing or endorsing internationally sourced vaccines.
Cognitive dissonance	The mental discomfort brought on by having two or more beliefs, attitudes, and values that directly contradict each other.	While CHWs were trained on the benefits of the COVID-19 vaccines, this knowledge was at odds with their personal beliefs and concerns about the safety and effectiveness of the vaccines. This cognitive dissonance was brought on by exposure to vaccine misinformation among vaccine-hesitant CHWs in Uganda and Tanzania in opposition to their professional training.
Belief bias	The tendency to evaluate the validity of a claim based on how believable or probable a person subjectively finds it.	Vaccine-hesitant CHWs in Tanzania and Zambia believed that the vaccines were developed for profit-motivated reasons, that they contained harmful substances, and that they caused a variety of side effects.

Opportunity

Cognitive bias/insight	Definition	Examples from the data
Authority bias	The tendency to add more weight to the opinions of perceived authority figures.	In Tanzania, vaccine-hesitant CHWs were actively discouraged from getting the vaccine by local community and religious leaders. Across all countries, community members noted that some authority figures voiced their concerns about or actively discouraged acceptance of the COVID-19 vaccine. This adversely influenced their intention to take the vaccine.
Cognitive overload	Access to too much information or having too many simultaneous tasks causes a reduction in efficiency and effectiveness.	Due to multiple responsibilities across different departments, insufficient staffing and extensive paperwork, CHWs experienced work-related stress and burnout that impacted their ability to support vaccine outreaches and in-facility service provision.
Illusory truth effect	Repeated exposure to misinformation makes people more likely to believe it.	In all countries, CHWs reported that locally-held beliefs about vaccines, repeated through social networks and communities, reinforced the believability of these misconceptions and affected the motivation of their peers to get vaccinated.
Social conformity	The tendency to align one's beliefs, attitude, or behaviors with others with whom they identify.	Peer conversations and clinical briefings served to encourage the uptake of vaccine services among Zambian and Malian vaccine-hesitant CHWs.

Motivation

Cognitive bias/insight	Definition	Examples from the data
Psychological reactance	The discomfort felt as a result of rules, regulations, and mandates that are seen as threats to an individual's decision-making freedoms.	Zambian vaccine-hesitant CHWs felt discomfort and resisted the vaccination mandates as they believed they were coercive.
Authority bias	The tendency to add more weight to the opinions of perceived authority figures.	Vaccine-hesitant CHWs were motivated to take up the vaccines after observing local leaders in Uganda, and health facility supervisors in Tanzania.
Pessimism bias	The tendency to overestimate the probability or likelihood of the occurrence of a negative outcome while underestimating the likelihood of a positive outcome.	In all countries, vaccine-hesitant CHWs believed that they were at a high risk of experiencing the moderate-to-severe side effects of vaccination and were not motivated to take the vaccine. This was fueled by the misinformation they were exposed to. This perceived risk was greater than their perceived likelihood of not experiencing these symptoms.
Loss aversion bias	The phenomenon where an actual or potential loss is perceived more intensely than equivalent gains.	In Uganda and Tanzania, CHWs were averse to the potential loss of income and employment as a result of non-adherence to governmental vaccine mandates. Across all countries, CHWs were also motivated to get vaccinated to avoid spreading the disease to their patients.

ANNEX 5: BIBLIOGRAPHY

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