

The Little Jab Book

18 Behavioral Science Strategies for Increasing Vaccination Uptake



COMMON THREAD



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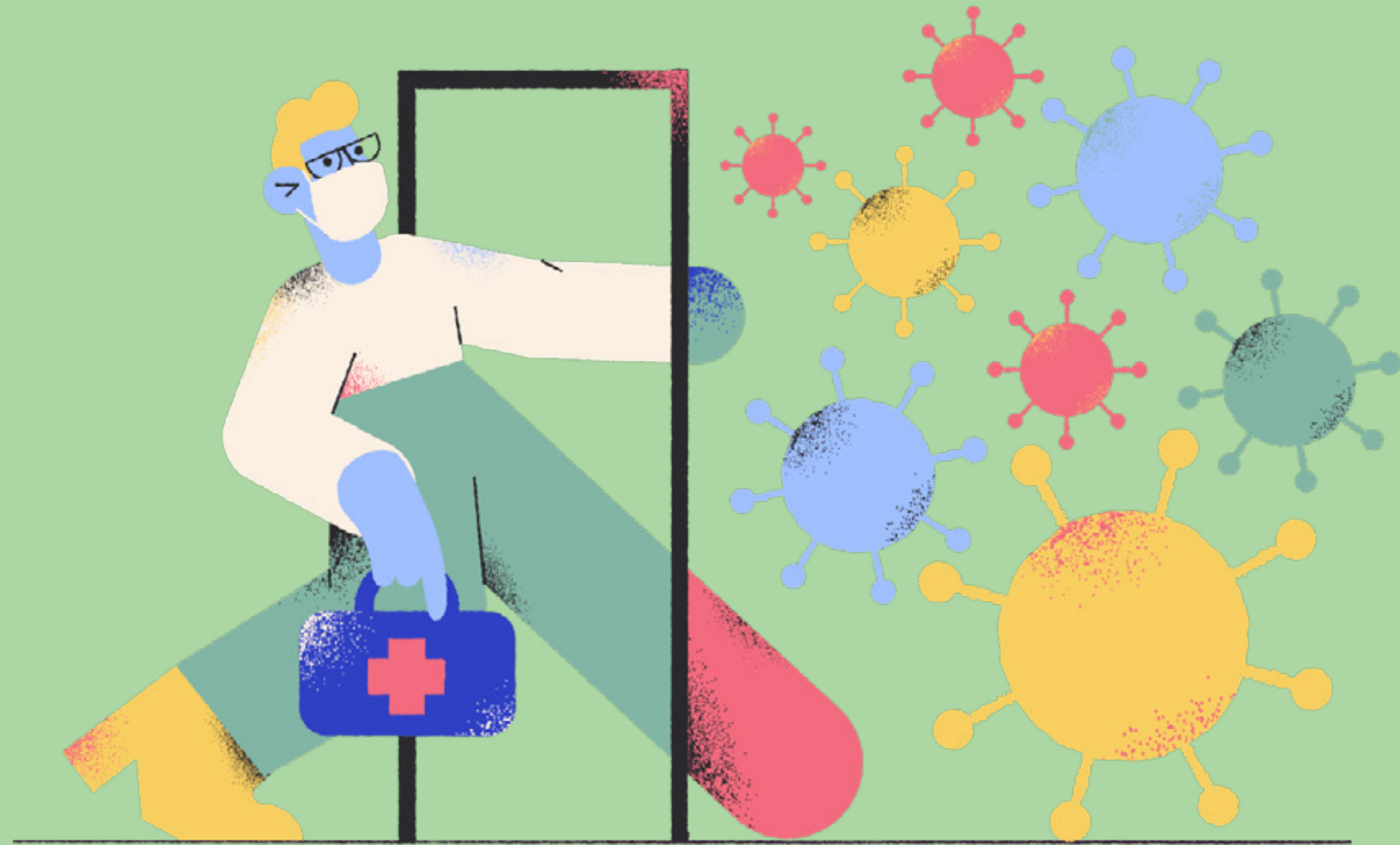
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Introduction



Introduction



Shamiso, 10, with facemask, Zimbabwe

With the COVID-19 pandemic and corresponding global vaccine race, 2021 is a critical year. Vaccines are considered to be the best solution to end the current pandemic, symbolising hope and a return to the way things were. Even though vaccination has proven to be effective time and time again, it needs to overcome a number of challenges, including low uptake, social stigma, and lack of accurate information, in order to work. A majority of vaccination programs focus on the supply side, ensuring that everyone has opportunities to get vaccines. However, the journey to vaccination begins long before that, when individuals and communities start learning about a vaccine and think about getting it. It is vital to understand how people make decisions related to vaccination in order to create vaccination programs and roll-outs that encourage more people to get vaccinated.

A growing body of research from psychology, behavioral economics and neuroscience - collectively termed behavioral science - finds that individuals frequently do not act upon their preferences even if they have strong intentions to do so. Vaccination is no different. Individuals often do not prioritize vaccines because they fail to see the long term benefits and instead focus on the short term costs and concerns around getting the vaccine. We also find it challenging to commit to doing something, and we often forget to do things we plan. In some cases, the problem is more severe, as seen in the case of the HPV vaccine in parts of Africa: 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.**

Overcoming such constraints requires a careful diagnosis of the specific behavioral problem, and solutions that directly address it. Keeping this in mind, we have designed this little guide to serve as a source of inspiration and creativity for program managers, policymakers, and organizations as they work towards mobilizing the communities they serve to get a COVID-19 vaccine.

What does this guide include?

The Little Jab Book unpacks barriers to vaccination through case studies.

A barrier is anything that hinders a course of action, in this case, vaccination, and includes informational gaps, supply side problems, and behavioral challenges. This guide begins with a look into common barriers to vaccination and provides an overview of why these barriers occur. It then highlights common interventions and strategies to increase vaccination uptake and provides a series of case studies to show how behavioral barriers to vaccination uptake have been addressed.

The Little Jab Book includes **18 behavioral science case studies** that have been drawn from historical vaccination efforts and identified as the most relevant for the current context. The selected studies focus on actual behavior change (vaccine uptake) rather than changes in vaccine attitude and intentions. This book also compiles evidence from around the world, especially the Global South, as this is where the most critical COVID-19 vaccination challenge may be.



How to use this guide

The Little Jab Book is intended to be used without any prior knowledge of behavioral science.

You can pick this book up across the vaccination process, from early campaigning through follow-ups for second doses, as it contains ideas and interventions across all phases of the process. It can also be consulted for ideas on how to overcome a specific known barrier or be used to start exploring barriers to vaccine uptake within your target population to build your own interventions. **The only thing you need to know before applying and adapting these behavioral science case studies is that the solutions depend on context, which means you will have to think about how something will work or be perceived where you are.** If you're unsure, run a small test or reach out to us so we can help you make your program a success.

It is our hope that this guide proves to be a useful tool in the road to full vaccination coverage. We look forward to seeing how you apply the ideas in this book and play your part in this journey.

There are common barriers that you will need to overcome

Structural barriers

COST

ACCESS

POOR INFRASTRUCTURE

Behavioral barriers

INERTIA

PREVAILING SOCIAL NORMS

PRESENT BIAS

FORGETFULNESS

LACK OF DETERMINATION

FRICTION

MISPERCEPTION

SOCIAL MOTIVES AND MEANINGS

Informational barriers

MISINFORMATION

LACK OF ADEQUATE INFORMATION

COMPLEXITY OF INFORMATION

Common structural barriers

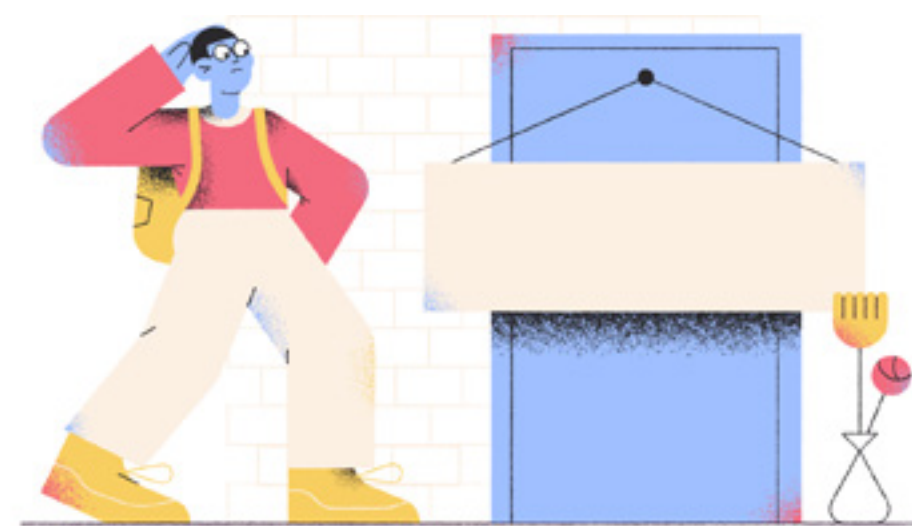
COST

Individuals may want to get the vaccine but may find it expensive, not just in terms of the monetary cost of the vaccine but also in terms of the time and income sacrificed to go to the vaccination clinic.



ACCESS

For individuals living in remote regions, the vaccine might be too far away, the cost of traveling to receive the vaccine might be too high, they may not have documentation necessary to receive the vaccine or there simply might not be enough doses for everyone.



POOR INFRASTRUCTURE

In many cases, people are deterred by their experiences with the infrastructure or care system itself, including poor service, long waiting times, unclear processes, and irregular hours of operation. These experiences can tarnish their trust and make them hesitant to access them.



Common behavioral barriers



INERTIA

Individuals are accustomed to the status quo and often do not want to put in effort to change things or make decisions. This mindset can lead to behaviors such as procrastination.

PRESENT BIAS

Individuals are drawn to immediate gains or costs, and find it challenging to recognize and justify long-term outcomes, even if the positives outweigh the short term costs.

FORGETFULNESS

This barrier could strike at many stages of the vaccination process from booking an appointment to coming to the appointment to attending a follow-up.

LACK OF DETERMINATION

Individuals underestimate their ability to adhere to a course of action, such as getting vaccinated, and are often tempted by an easier option, such as not doing anything.

MISPERCEPTION

Individuals sometimes have beliefs or opinions that are inaccurate. This can stem from misinformation or community practices and lead to fear, resistance, or a lack of trust.

PREVAILING SOCIAL NORMS

Individuals are guided by and follow what others in their community are doing. Stigma against certain vaccines might pose issues for the uptake of those vaccines.

SOCIAL MOTIVES AND MEANINGS

Choices are often motivated by social meaning, such as how one is perceived or their status within a community. People need to be given a compelling motive to do something.

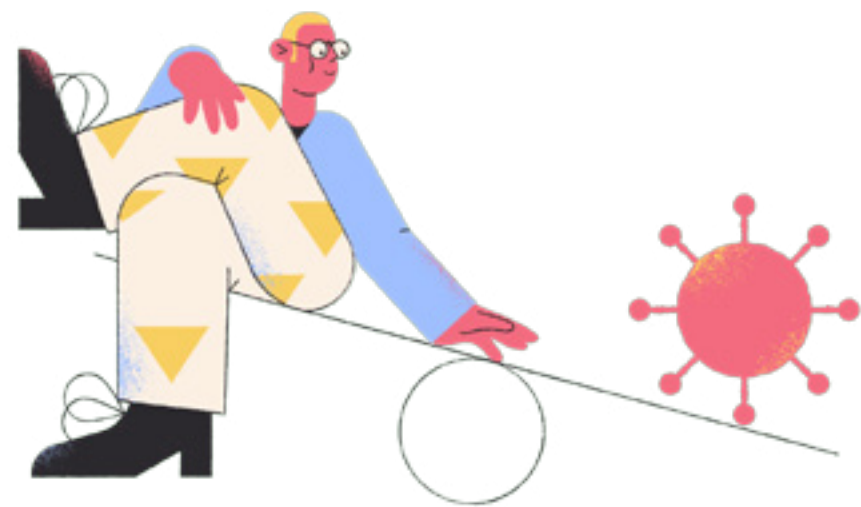
FRICTION

Individuals are easily discouraged by complex processes. If the process of booking an appointment for a vaccine or attending the appointment is too complicated, they will not follow through.

Common **informational** barriers

MISINFORMATION

False information about the causes of COVID-19, its side-effects, and vaccination plans have spread rapidly, exacerbated by the use of social media. This has made it challenging for useful and helpful information to be shared and believed.



LACK OF ADEQUATE INFORMATION

Some populations do not have access to useful and necessary information, such as side effects, vaccination centers, or even why one should vaccinate. This is especially common for vulnerable and remote populations.



COMPLEXITY OF INFORMATION

Even before identifying pertinent information, an individual has to understand the information they encounter. This is especially challenging for low literacy populations and exacerbated by the multiple types of vaccines offered.



Questions to ask yourself before using this guide

Knowing your audience

These questions will help you select your primary audience and understand them a bit more.



Rebecca*, takes part in a Save the Children training for Hygiene Promoters in Kapoeta, South Sudan

- Who is the top priority to be vaccinated? Why? (Be specific, think about age, gender, location, profession, socio-economic status, etc.)
- What is their general attitude and perception of vaccination? Do they currently welcome vaccination?
- What is their current vaccination coverage rate? Has this changed over the years? Do you know why?
- How risk averse is my audience generally?
- How risk averse is my audience regarding the COVID-19 vaccine?
- Who makes decisions around health and vaccine for this population? Who do they trust?
- What demographic details will help me understand this population better (education level, number of children, working hours, lifestyle)?

Questions to ask yourself before using this guide



Identifying structural barriers

These questions will demonstrate whether your audience has not been vaccinated due to structural barriers such as cost, access, and poor infrastructure.

- How long does it take to travel to the closest health facility for a vaccine?
- Are they able to travel to the clinic or vaccine drives? If no, why not?
- Are they able to afford to travel to the clinics or vaccine drives?
- What are they giving up (such as employment, opportunities, childcare, etc) to obtain the vaccine?
- Is there anything about the vaccine clinics that deters them (for example, is the clinic comfortable, are there waiting rooms, do people trust the healthcare workers)?

Questions to ask yourself before using this guide



Identifying behavioral barriers

Identifying Behavioral Barriers

These questions will help you understand why your audience has not yet gotten the vaccine even though they want to. If they have access, information, and want to get the vaccine but have not done so, it is possible that they are facing behavioral barriers, such as forgetfulness, misperception, social norms, friction, or a lack of determination. These questions can provide some insight into the causes behind not being vaccinated as well as the aspects that motivate them.

- Do they want the COVID-19 vaccine?
- Do they think the vaccine is safe?
- Do they think the vaccine will be effective?
- Are they afraid of the side-effects of vaccines, or the pain of getting vaccinated?
- Do they feel that they are at risk of getting COVID?
- Do they think getting COVID is dangerous to their health?
- Do they think it's dangerous for those around them?
- Are they aware and interested in how many people around them have received the vaccine? Do they typically follow what others in their community are doing?
- When appointments are available, do they find the process of registering for a vaccine and getting an appointment complicated?
- Have they decided to get the vaccine but are unable to follow through?
- What would motivate them to get the vaccine? Is it protecting other family members, returning to work, or other reasons?

Questions to ask yourself before using this guide

Identifying informational barriers

These questions will demonstrate whether your audience has not been vaccinated due to informational barriers such as access to information, complexity of information, and misinformation.



Yuliet and Jefferson wait their turn outside a health post in Los Patios in the midst of the COVID-19 pandemic.

- Have they heard about the COVID vaccine?
- Do they know why getting the COVID vaccine is important?
- Do they know where and when to get the vaccine?
- Is the information available hard to understand or unhelpful in guiding them to get the vaccine?
- Do they have accurate information about the COVID vaccine, including side-effects, nearby vaccination centers, and processes to get the vaccine?
- What vaccination topics do they not have enough accurate information about?

Snapshot of key behavioral insights

ALTRUISM

Doing things to help other people is a strong motivator of individual behavior.

ANTICIPATED REGRET

Avoiding the potential regret one might feel in the future can drive individual decision-making in the present.

AUTHORITY BIAS

Individuals are likely to follow the advice of authorities.

COMMITMENT DEVICES

Using external factors, such as pledges, promises, and other people, to hold oneself accountable for achieving a goal or intention.

COMMUNITY MOBILIZATION

Building trust and working with communities to create effective change through social proofing and setting new norms.

DEFAULTS

Creating a pre-decided course of action that occurs if the decision-maker does not specify their choice.

DESCRIPTIVE SOCIAL NORMS

Individual behaviors are driven by what others around them, particularly people like them, are doing.

ENDOWMENT EFFECT

Individuals are more likely to value and utilize things that belong to them, or that they perceive to belong to them.

IDENTIFIABLE VICTIM EFFECT

The plight of a specific individual or small group of individuals in distress provokes a much stronger response than statistics on large groups of people.

IKEA EFFECT

Individuals place a much higher value on something they have made themselves than something given to them.

IMPLEMENTATION INTENTIONS

Self-imposed strategies, often prompted by the questions of "When? Where? How?" to help create a plan of action that assists in following through on a behavior.

INCENTIVES

Individuals are motivated by rewards (financial & non financial) and recognition.

INJUNCTIVE NORMS

Individual behaviors are driven by how things should be or what they ought to do.

LOSS AVERSION

Individuals are more strongly affected by losses than gains, so framing choices as avoiding losses can be a powerful motivator.

MESSENGER EFFECT

Individuals are more likely to act on information that comes from a trusted or aspirational messenger.

REMINDERS

Timely and strategically placed cues to draw an individual's attention towards an intended action.

SIMPLIFICATION

Distilling necessary action into simpler steps makes it easier to act upon.

SOCIAL PROOF

Following or imitating the behavior of peers drive individual behavior.

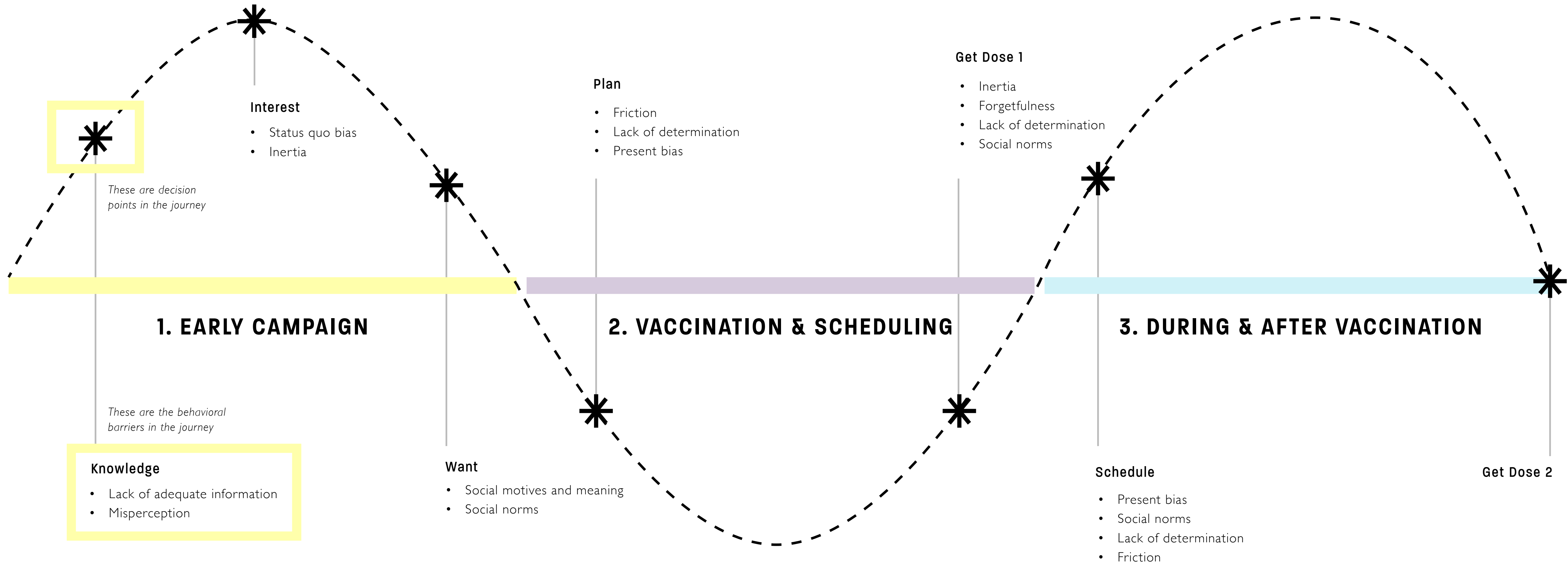
SOCIAL SIGNALLING

Individuals often do things to signal to those around them what type of person they are.

USING POSITIVE FRAMING

Choices that are framed positively are often more likely to be acted upon.

Journey to vaccination



Early Campaign



1.

Involve trusted messengers to build credibility

LOCATION

Pakistan

BARRIERS TO OVERCOME

Lack of adequate information

Misperception

Trust

TARGET POPULATION

Parents of infants

EVIDENCE

Using trusted messengers to share their experiences with parents in the community helped increase vaccination rates. A group of parents participated in structured discussions on vaccination rates, costs and benefits of childhood vaccination, and local action plans. Participants in these discussions were then encouraged to share their learnings with other members of their community. **Using community members as a medium of sharing information doubled and tripled the measles and DTP vaccination rates respectively.**

BEHAVIORAL INSIGHTS

The Messenger Effect: People are influenced and quickly take cues on an issue based on who is conveying the information. In this case, encouraging health experts within local communities to become messengers is likely to be effective, as members of their own communities are more relatable.

Implementation Intentions: Implementation intentions are self-imposed strategies in the form of “if-then” or “When? Where? How?” plans that help individuals break down their goals or intentions into something more specific and achievable. By making local action plans, individuals are more likely to follow through as they have made it easier for themselves to complete the desired behavior.

APPLICATION TO COVID

Think about who people trust. If people do not believe in the current healthcare system, it would help to look for other messengers rather than health experts, for example peers, influencers, or religious leaders. Trusted people can vary from community to community and can be identified with local expertise.

Andersson, N., Cockcroft, A., Ansari, N. M., Omer, K., Baloch, M., Foster, A. H., ... & Soberanis, J. L. (2009). Evidence-based discussion increases childhood vaccination uptake: a randomised cluster controlled trial of knowledge translation in Pakistan. *BMC International Health and Human Rights*, 9(1), 1-9.



2.

Frame things positively

LOCATION

USA

BARRIERS TO OVERCOME

Status quo bias

Present bias

Social motives and meaning

TARGET POPULATION

Pregnant women

EVIDENCE

Framing, the way a choice is presented to decision-makers, can play an important role in how a choice is made. Research studies on vaccination and framing have found that both positive and negative framing can be powerful, depending on the recipient and context.

A research study with low income pregnant women found that women who received positively framed messages were more likely to vaccinate their children against influenza than women who received neutral messages. This study also found that negatively framed messages were more effective than neutral messages but slightly less effective than positive framing.

BEHAVIORAL INSIGHTS

Positive framing: Making the benefits of an action more tangible and focusing on the positive outcomes might induce more people to undertake that action. For positive framing to work, future outcomes must be seen as important, credible, achievable, and in alignment with their existing beliefs and goals.

APPLICATION TO COVID

Focus on what people can gain from getting the COVID vaccine: better health, security against COVID, seeing loved ones, working, and not living in fear or uncertainty.

Since framing has not been tested for the COVID vaccine, it is important to test out what framing is effective for your population.

Frew, P.M., Zhang, S., Saint-Victor, D. S., Schade, A. C., Benedict, S., Banan, M., ... & Omer, S. B. (2013). Influenza vaccination acceptance among diverse pregnant women and its impact on infant immunization. *Human vaccines & immunotherapeutics*, 9(12), 2591-2602.



3.

Help people feel entitled to the vaccine

LOCATION

India

BARRIERS TO OVERCOME

Inertia

Lack of determination

Lack of adequate information

TARGET POPULATION

Rural populations in India who did not utilize basic health and social services

EVIDENCE

Education campaigns in rural India helped alter people's perception of health and social services. When people were educated and made aware of their right to these services, the demand for health and social services increased across the community. This campaign first overcame the information gap and then framed health services as something people were supposed to or expected to use. Over the course of a year, there was an increase in prenatal examinations, tetanus and other infant vaccinations, and distribution of prenatal supplements.

BEHAVIORAL INSIGHTS

Endowment Effect: People feel strongly about holding onto or utilizing things that belong to them. If individuals feel entitled to public services, they might be empowered to demand these services from public workers.



APPLICATION TO COVID

Making information about the vaccine salient, and communicating the vaccine as something that is reserved for people and that they are entitled to can result in higher vaccine uptake. This not only encourages individuals to get vaccinations but builds the expectation that getting a vaccination is the norm or default.

A recent large scale flu vaccination study launched by the University of Pennsylvania's Behavior Change for Good Initiative revealed that sending a text message to individuals stating that a vaccine is reserved in their name led to a significant increase in uptake. This also reflects the endowment effect.

Pandey, P., Sehgal, A. R., Riboud, M., Levine, D., & Goyal, M. (2007). Informing resource-poor populations and the delivery of entitled health and social services in rural India: a cluster randomized controlled trial. *Jama*, 298(16), 1867-1875.

Milkman, Katherine L. and Patel, Mitesh S. and Gandhi, Linnea and Graci, Heather and Gromet, Dena and Ho, Quoc Dang Hung and Kay, Joseph and Lee, Timothy and Akinola, Modupe and Beshears, John and Bogard, Jonathan and Buttenheim, Alison and Chabris, Christopher and Chapman, Gretchen B. and Choi, James J. and Dai, Hengchen and Fox, Craig R. and Goren, Amir and Hilchey, Matthew and Hmurovic, Jillian and John, Leslie and Karlan, Dean and Kim, Melanie and Laibson, David I. and Lambertson, Cait and Madrian, Brigitte C. and Meyer, Michelle N. and Modanu, Maria and Nam, Jimin and Rogers, Todd and Rondina, Renante and Saccardo, Silvia and Shermohammed, Maheen and Soman, Dilip and Sparks, Jehan and Warren, Caleb and Weber, Megan and Berman, Ron and Evans, Chalanda and Snider, Christopher and Tsukayama, Eli and Van den Bulte, Christophe and Volpp, Kevin and Duckworth, Angela, A Mega-Study of Text-Based Nudges Encouraging Patients to Get Vaccinated at an Upcoming Doctor's Appointment (January 27, 2021). Available at SSRN: <https://ssrn.com/abstract=3780267> or <http://dx.doi.org/10.2139/ssrn.3780267>

4.

Encourage people to think of those they care about

LOCATION

USA

BARRIERS TO OVERCOME

Inertia

Social motives and meaning

TARGET POPULATION

Average citizens

EVIDENCE

A lab study in the US found that individuals would be most willing to get vaccinated against a contagious disease either to protect those around them (reflecting altruism) or if others were getting it (utilizing social proof).

BEHAVIORAL INSIGHTS

Altruism: Talking about vaccination as an altruistic choice and highlighting its social benefits (helping shield others from infection) can encourage vaccine uptake. People will feel as though they are doing their communities and loved ones a favor by getting vaccinated. Young people might be more willing to get vaccinated if it is clear that the vaccination will benefit their grandparents.

Social Proof: Individuals are more likely to adopt a behavior that many others are doing. This can be done via different means, such as sharing photos or videos of people getting vaccinated, or highlighting the increasing proportion of community members who have been vaccinated.

APPLICATION TO COVID

Frame getting the vaccine as an act to protect family members, friends, or vulnerable members of their community. The exact way of framing altruism will vary by culture, with some groups of people wanting to protect family members, while others might be thinking more of the greater good and society as a whole.

Hershey, J. C., Asch, D. A., Thumasathit, T., Meszaros, J., & Waters, V. V. (1994). The roles of altruism, free riding, and bandwagoning in vaccination decisions. *Organizational behavior and human decision processes*, 59(2), 177-187.



5.

Provide small non-financial incentives

LOCATION

India

BARRIERS TO OVERCOME

Inertia

Present bias

Access

Affordability

TARGET POPULATION

Parents of children aged 1-3

EVIDENCE

One of the most famous vaccination programs, the Pulse Polio program, has its roots in incentives. Non-monetary incentives such as a packet of lentils were given to parents each time they vaccinated their child. They also received a metal plate when the child completed all the required vaccines. Regions with these incentives had a vaccination rate twice that of regions where these incentives were not offered.

BEHAVIORAL INSIGHTS

Incentives: Providing small non-financial incentives can help address present bias and make the rewards of an action more salient in the present. Providing a small benefit closes the intention-action gap by making the action attractive for those already interested.

APPLICATION TO COVID

Offer small non-financial incentives, (e.g. soap or small food items) to compensate people for the time and money they spent to go and get the vaccine. Keep monitoring this program to make sure that the incentive is overcoming a behavioral barrier, and not leading to any adverse consequences, such as people refusing vaccines if incentives are unavailable.

Banerjee, A.V., Duflo, E., Glennerster, R., & Kothari, D. (2010). Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. *Bmj*, 340.



6.

Keep it simple

LOCATION

Pakistan

BARRIERS TO OVERCOME

Inertia

Friction

Complexity of Information

TARGET POPULATION

Parents of infants

EVIDENCE

When thinking about sharing key information, it is important to consider how the target audience will be able to receive and process it. Parents with low literacy and poor knowledge of vaccines were given targeted pictorial messages about getting their children immunized. The messages conveyed how vaccines save children's lives, logistics of the local vaccination centers, and the importance of immunization cards for school admissions. These messages were shared by community health workers and led to an increase in DPT/Hepatitis B immunization rates.

BEHAVIORAL INSIGHTS

Simplification: Even for the average individual, vaccination sign-up procedures and healthcare systems may be daunting to navigate. This is even more pronounced for low literacy and remote populations. Simplification is an effective tool to capture the essence of what an individual needs to know and clearly convey what is being asked of them. Making something easier to understand will help users take action.

APPLICATION TO COVID

Create materials that are easy to read and informative without being too wordy or long. Infographics with images and icons can be a helpful way of getting the right amount of information across.

Owais, A., Hanif, B., Siddiqui, A. R., Agha, A., & Zaidi, A. K. (2011). Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomized-controlled trial in Karachi, Pakistan. *BMC public health*, 11(1), 1-8.



7.

Involve communities and community leaders

LOCATION

Kenya

BARRIERS TO OVERCOME

Lack of adequate information

Misperception

Trust

TARGET POPULATION

Mothers with children between the ages of 9-12 months

EVIDENCE

In many settings, individuals take their cues from the community they belong to. A group of community volunteers were identified to lead maternal health programs, track pregnant women, and refer sick children to health facilities. The volunteers were selected by community members in meetings led by chiefs, giving them the support and backing of the community as they went about their work. The community's involvement in selecting volunteers was likely to have eased their work and helped improve vaccination rates among infants.

BEHAVIORAL INSIGHTS

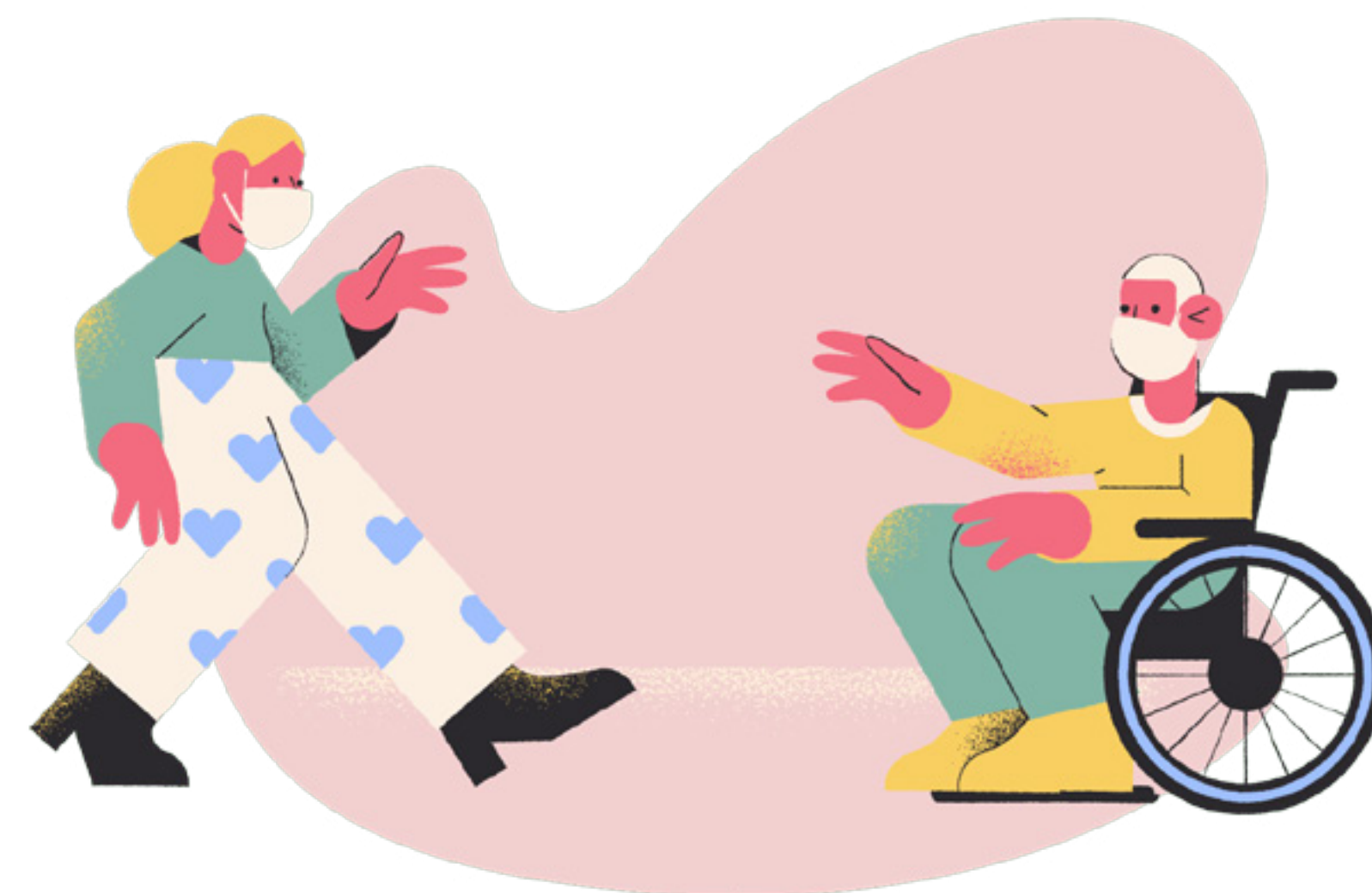
Community Mobilization: The community, especially respected members such as chiefs, play an important role in determining the social acceptability of a course of action and the spread of information. Involving community members will help influence others within that community and set a new norm about the right course of action.

Authority Bias: People are easily influenced by authority figures as they believe them to be knowledgeable. In this case, the volunteers were trusted because they had the backing of chiefs.

APPLICATION TO COVID

Speak to and involve community leaders, especially in non-urban tight-knit communities, to build trust.

Nzioki, J. M., Ouma, J., Ombaka, J. H., & Onyango, R. O. (2017). Community health worker interventions are key to optimal infant immunization coverage, evidence from a pretest-posttest experiment in Mwingi, Kenya. *Pan African Medical Journal*, 28(1).



Vaccination & Scheduling



8.

Get people to make specific plans

LOCATION

USA

BARRIERS TO OVERCOME

Lack of determination

TARGET POPULATION

Working adults

EVIDENCE

A set of individuals received reminder emails that listed the times and locations of influenza vaccination clinics near them. Some were prompted to write down the date they would get vaccinated, while others were asked to write down the date and time. Vaccination rates increased when specific implementation intention prompts were included in the message. Implementation intentions help make goals more achievable and specific by clarifying details on how the goal will be attained.

BEHAVIORAL INSIGHTS

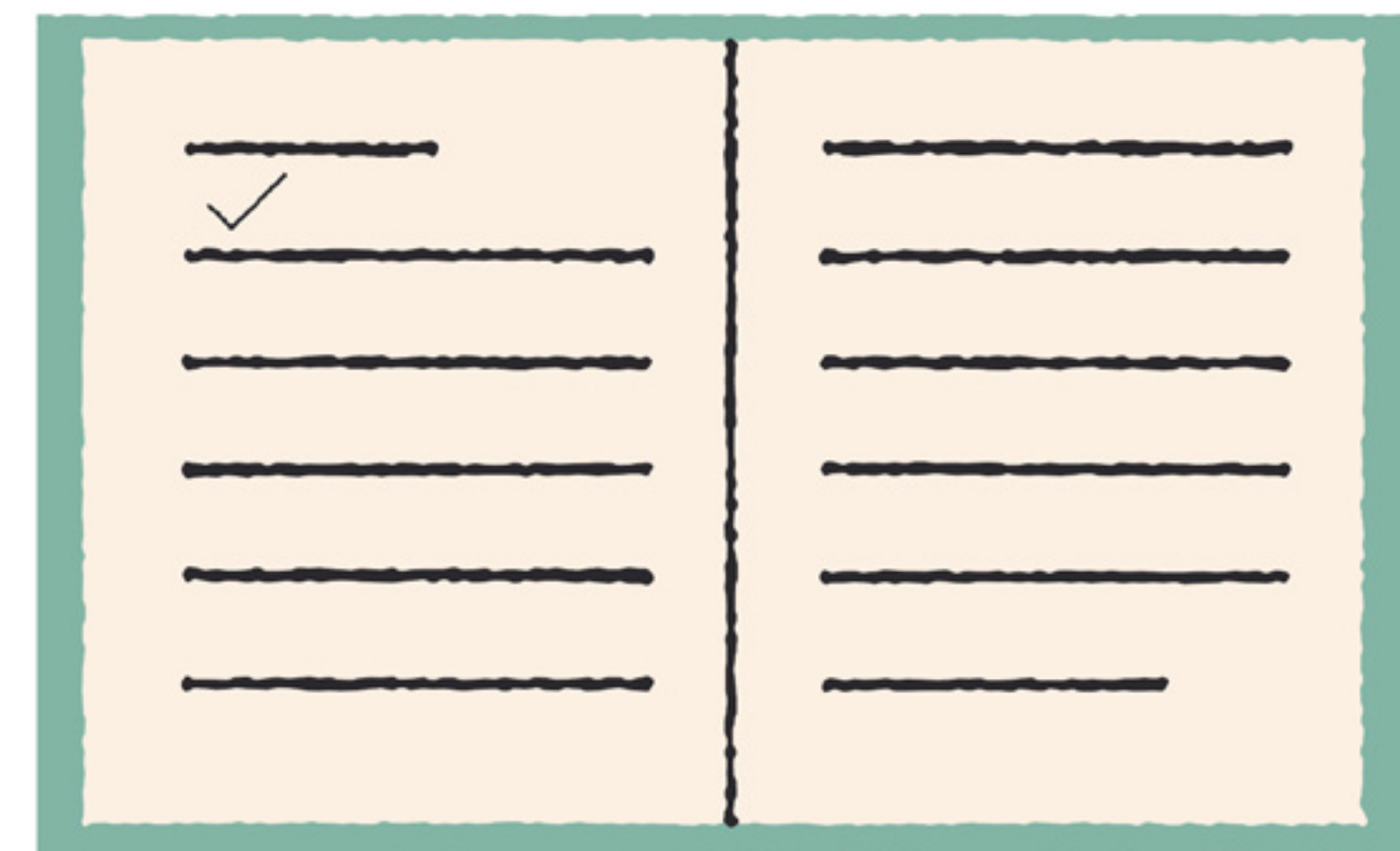
Commitment Devices: Commitment devices can take many forms, including public pledges or detailed plans, and rely on self-image, social motivators, and nudges to work. By making a commitment, people have made it more challenging to back out or find excuses.

Implementation Intentions: While reminders and pledges themselves are helpful tools, it pays to go a step further and add an implementation intention. Implementation intentions are self-imposed strategies in the form of “if-then” or “When? Where? How?” plans that help individuals break down their goals or intentions into something more specific and achievable. By making a concrete commitment, people are more likely to follow through as they have made it easier for themselves to complete the desired behavior.

APPLICATION TO COVID

Ask people to take a clear action like booking an appointment or a follow-up appointment. Allow people to choose the mode of communication they would prefer for their reminders. By building this plan into their schedules in advance, people are less likely to delay or procrastinate.

Milkman, Katherine L., et al. “Using implementation intentions prompts to enhance influenza vaccination rates.” *Proceedings of the National Academy of Sciences* 108.26 (2011): 10415-10420.



9.

Tell compelling individual stories

LOCATION

USA

BARRIERS TO OVERCOME

Inertia

Present bias

TARGET POPULATION

Undergraduate students

EVIDENCE

Stories of individual suffering can be more compelling and lead to greater action than simply sharing statistics. A study on donations asked individuals to choose between donating some money to a young girl suffering from starvation in Africa or an organization working against food insecurity in Africa. Individuals often gave more of their money to the single child. This behavior has been widely proven across a number of research studies.

BEHAVIORAL INSIGHTS

Identifiable Victim Effect: The plight of a specific individual or a specific small group of people, such as a family, in distress provokes a much stronger response in people than large statistical groups. One reason could be that people feel as though they can help and make an impact on one person's life, rather than having a small impact on the lives of many.

APPLICATION TO COVID

Share stories of specific individuals who have been vaccinated and how it has benefited them. It might also help to share stories of those who have suffered because of COVID to encourage people to protect themselves from a similar experience.

Small, D.A., Loewenstein, G., & Slovic, P. (2007). Sympathy and callousness: The impact of deliberative thought on donations to identifiable and statistical victims. *Organizational Behavior and Human Decision Processes*, 102(2), 143-153.



10.

Co-create solutions with the people you aim to reach

LOCATION

Pakistan

BARRIERS TO OVERCOME

Social norms

Lack of determination

TARGET POPULATION

Rural households with children

EVIDENCE

Individuals from select communities were chosen to lead discussions on vaccinations. These volunteers then worked with community leaders and members to identify barriers to vaccination, develop action plans, and disseminate information about the importance of vaccination. The participation of community members played an important role in developing solutions and overcoming the identified barriers.

A similar participatory approach was followed in India to create microplans that specified dates, venue, vaccinator, number of clients, vaccine requirements, and vaccine delivery mechanism for each vaccination session.

BEHAVIORAL INSIGHTS

IKEA Effect: People place higher value on things they have created themselves or put effort into. Getting the target population involved will make them feel a sense of ownership, encourage following their plan or using the services over time.

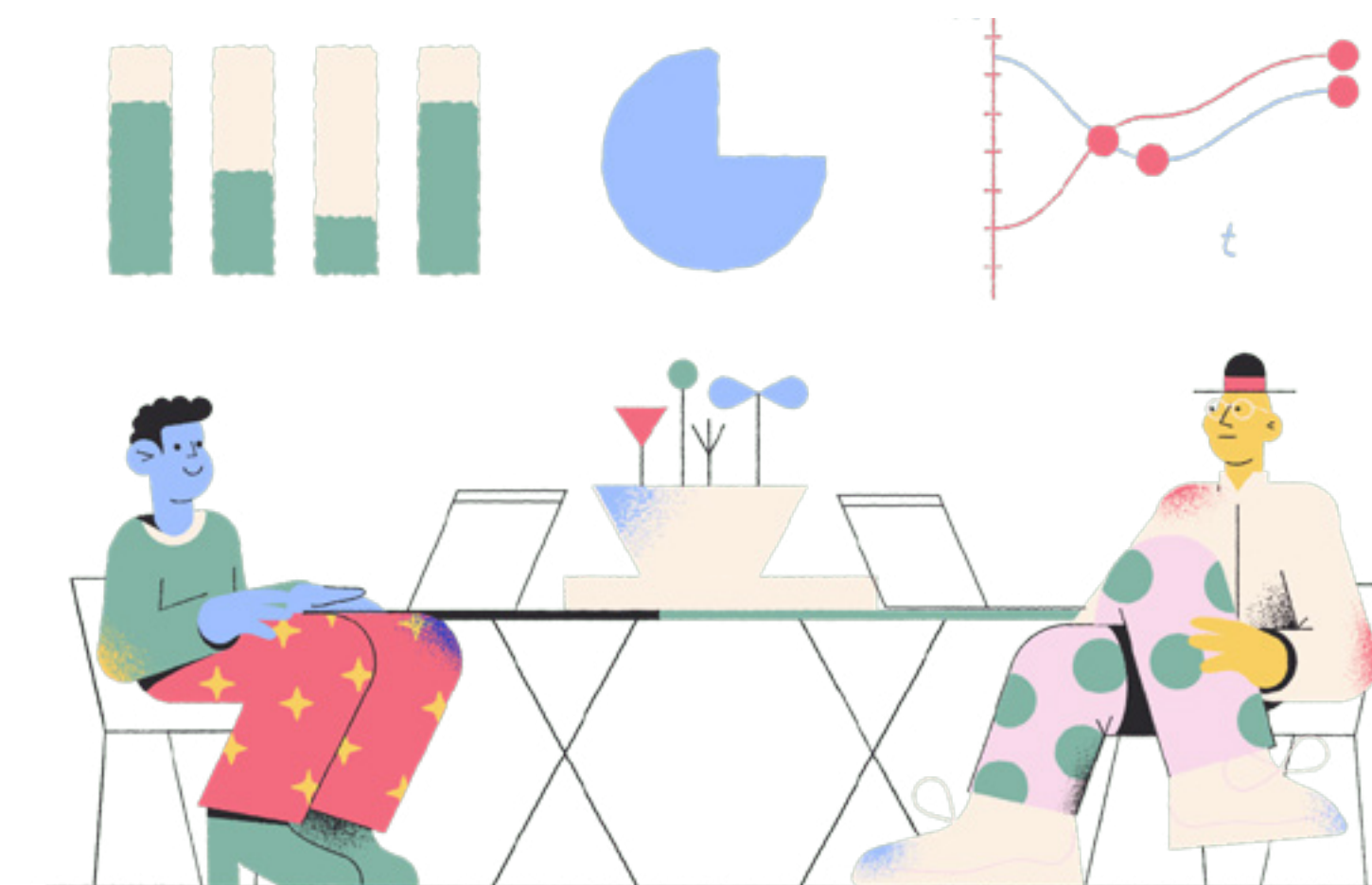
Implementation Intentions: Making concrete plans that specify the details of vaccination helps break down goals or intentions. By creating microplans, communities made the process of getting the vaccine easier for people by removing worries about the vaccination availability and location.

APPLICATION TO COVID

Work with target populations to craft action plans for their community. When implementing the plan, draw attention to the community's involvement and role in creating the plan to motivate them to follow through.

Andersson, N., Cockcroft, A., Ansari, N. M., Omer, K., Baloch, M., Foster, A. H., ... & Soberanis, J. L. (2009). Evidence-based discussion increases childhood vaccination uptake: a randomised cluster controlled trial of knowledge translation in Pakistan. *BMC International Health and Human Rights*, 9(1), 1-9.

Prinja, S., Gupta, M., Singh, A., & Kumar, R. (2010). Effectiveness of planning and management interventions for improving age-appropriate immunization in rural India. *Bulletin of the World Health Organization*, 88, 97-103.



11.

Highlight that people who avoid vaccination may “miss out”

LOCATION

USA

BARRIERS TO OVERCOME

Present bias

Inertia

TARGET POPULATION

Young adults

EVIDENCE

The prospect of losing out on an opportunity to protect oneself can play an important role in influencing the uptake of that opportunity. A survey of young adults found that the feeling of anticipated regret affected the likelihood of getting vaccinated. Those who experienced greater anticipated regret, in this case, feeling bad if they chose to forgo the vaccine and then ended up unwell, was correlated with high vaccination intention.

BEHAVIORAL INSIGHTS

Anticipated Regret: Anticipated regret is the tendency to factor in the potential regret we might feel in the future when choosing between options. This also stems from the asymmetric ways in which people assess gains and losses - more negative events seem to affect people more when they imagine the potential outcomes.

Loss Aversion: People feel losses more strongly than they feel gains. Framing vaccination messages along the lines of what people might lose if they choose to not get vaccinated might motivate them to try to prevent loss and seek vaccination.

APPLICATION TO COVID

Anticipated regret has been strongly associated with vaccination intention and behavior. While it has typically been used in the anti-vaccine front (eg. What if my child gets sick from the vaccine?), this can be flipped into a positive variant to encourage vaccination instead.

Ask people: “Would you regret it if you got COVID because you didn't get vaccinated?”

Additionally, making something seem scarce increases its perceived value, so creating a sign-up schedule or sharing how many spots are left might encourage people to think of the vaccine as valuable and sign up. Keep in mind that striking the balance between making it seem valuable and making people worry about availability is delicate!

Ziarnowski, K. L., Brewer, N.T., & Weber, B. (2009). Present choices, future outcomes: anticipated regret and HPV vaccination. *Preventive medicine*, 48(5), 411-414.

12.

Set norms around vaccination

LOCATION

USA

BARRIERS TO OVERCOME

Inertia

Social norms

TARGET POPULATION

Caregivers of adolescents

EVIDENCE

Physicians and nurses in clinics in the US announced to parents that their adolescents were due for vaccinations during the adolescents' routine check-ups. The physicians and nurses are often perceived as credible authority figures. By announcing vaccination requirements during visits to the doctor, clinics were able to set the expectation that getting a vaccination was important, and increase the uptake of the HPV vaccine.

BEHAVIORAL INSIGHTS

Injunctive Norms: Injunctive norms prescribe ideal behaviors. They suggest how things should be or what people ought to be doing, for example, "Getting vaccinations are the right thing to do." By simply stating the vaccination requirements, nurses and doctors were able to build the idea that these vaccinations were necessary and ought to be taken soon.

Messenger Effect: People consistently rate physicians and nurses as among the highest for honesty and ethical standards. This often reflects in higher trust in their recommendations.

Authority bias: People are easily influenced by authority figures as they believe them to be knowledgeable.

APPLICATION TO COVID

Get doctors, respected politicians, athletes, and actors to get the vaccination and talk about it as the right thing to do. Instead of asking individuals *if* they will get vaccinated, they should try to ask *when* people will get vaccinated to indicate a shared understanding. The most effective messenger will be different for different communities and should be explored before using this strategy.

Brewer, N.T., Hall, M. E., Malo, T.L., Gilkey, M. B., Quinn, B., & Lathren, C. (2017). Announcements versus conversations to improve HPV vaccination coverage: a randomized trial. *Pediatrics*, 139(1).



13.

Tell people what others are actually doing

LOCATION

Timor Leste

India

BARRIERS TO OVERCOME

Inertia

Social norms

Misinformation

Misperception

TARGET POPULATION

Parents of young children

EVIDENCE

A poster was developed to track the births and vaccination dates of every infant in the community, thereby setting the descriptive norm that vaccination was not only recommended but actually being done by many parents. The tracking poster was displayed in a common area for everyone to see. The tracking poster did not only establish the norm of vaccination, it also made the process of recording and tracking this information easier.

BEHAVIORAL INSIGHTS

Descriptive social norms: Descriptive social norms illustrate how people around you are actually behaving. By sharing facts such as: “60% of your neighborhood has gotten vaccinated so far,” people can be prompted to conform to their group. It is important to frame these positively, rather than encourage people to stop following a behavior because others are not.

Social Proof: Social proof comes into play when people have a sense of what those around them are doing. This awareness is built through norms. As more people follow the footsteps of those in their community, we see social proof take place.

APPLICATION TO COVID

Leverage the fact that millions of people globally are getting vaccinated to set the descriptive social norm of vaccinations as the status quo.

Jain, M., Taneja, G., Amin, R., Steinglass, R., & Favin, M. (2015). Engaging communities with a simple tool to help increase immunization coverage. *Global Health: Science and Practice*, 3(1), 117-125.



14.

Pre-schedule appointments

LOCATION

USA

UK

BARRIERS TO OVERCOME

Friction

Lack of determination

TARGET POPULATION

Adults and school-going children

EVIDENCE

In the US, automatically scheduled appointments for the adult influenza vaccine increased the total vaccination rate. A program in the UK automatically vaccinated children at school, while allowing parents the right to opt out.

BEHAVIORAL INSIGHTS

Defaults: A default is a pre-decided action that occurs if the decision maker does not choose otherwise. When vaccination appointments are automatically set, people have to actively opt-out of this choice in order to avoid an appointment. Most people choose to not do so, as it requires more effort and cognitive load. However, people should not feel as though they are being forced into something and do not have a choice. By pre-scheduling, clinics are making sure individuals do not have to worry about which vaccine to take and when to get it, reducing the friction of having to schedule appointments themselves.

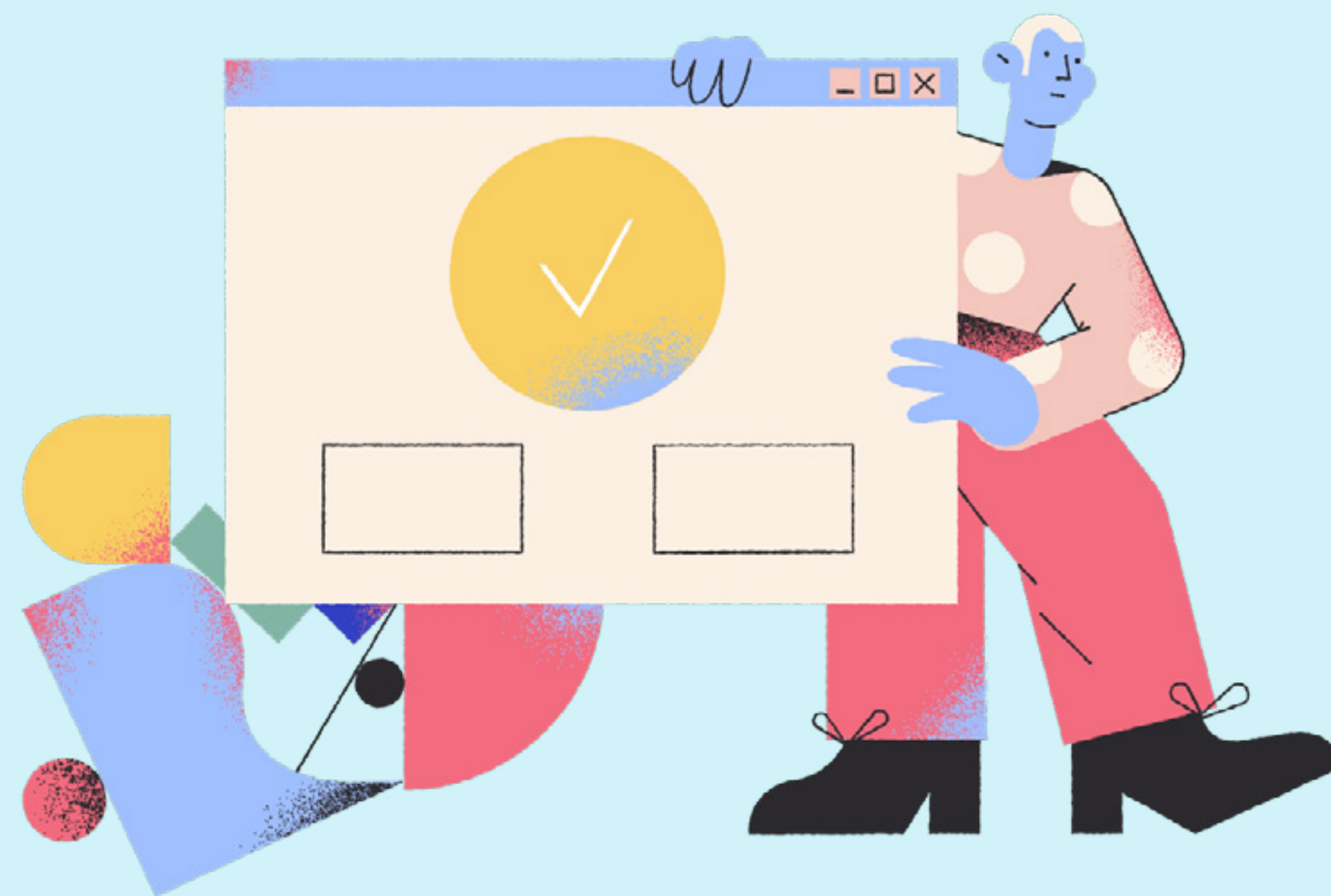
APPLICATION TO COVID

Offer the recommended vaccine and pre-schedule a vaccination appointment as the default option, but make sure there is an opt-out option so that people still have a choice. Moreover, defaults or pre-scheduling are only helpful in overcoming practical obstacles to vaccination and would likely not overcome barriers rooted in belief systems. While automatic enrollment has worked well for immunization of children, the case of COVID-19 might require more careful attention due to ethical questions.

Chapman, G. B., Li, M., Leventhal, H., & Leventhal, E. A. (2016). Default clinic appointments promote influenza vaccination uptake without a displacement effect. *Behavioral Science & Policy*, 2(2), 40-50.



During & After Vaccination



15.

Make it hassle free

LOCATION

UK

BARRIERS TO OVERCOME

Friction

Lack of determination

TARGET POPULATION

Senior citizens above the age of 75

EVIDENCE

The process of getting vaccinated is often filled with friction, which is anything that makes the process challenging, including filling out long complex forms, scheduling appointments, or having to find a clinic near you. Home vaccinations were found to be highly effective at reducing friction for people over the age of 75. Those who had the opportunity to receive home vaccinations were more likely to get vaccinated than those who simply received reminder letters. The vaccination was also bundled with a health check to make it more appealing and useful for the individual, rather than an additional visit they had to keep track of and complete.

BEHAVIORAL INSIGHTS

Simplification: Often people have the desire to do something but do not end up acting on it, due to lack of motivation, lack of incentives, or friction. Reducing barriers increases uptake of vaccination, especially for those who have the intention but do not act on it [intention-action gap].

APPLICATION TO COVID

Make the process of getting the vaccination convenient. This can be done by setting up vaccination centers or mobile clinics with flexible hours, granting a few hours off from work to get vaccinations, subsidizing the vaccine, or covering travel costs for rural and remote populations. Keep in mind that reducing barriers only works when individuals are already interested in getting the vaccine.

Arthur, A. J., Matthews, R. J., Jagger, C., Clarke, M., Hipkin, A., & Bennison, D. P. (2002). Improving uptake of influenza vaccination among older people: a randomised controlled trial. *British Journal of General Practice*, 52(482), 717-722.



16.

Send reminders

LOCATION

Nigeria

BARRIERS TO OVERCOME

Forgetfulness

TARGET POPULATION

Mothers and caregivers

EVIDENCE

While healthcare workers are often aware of their duties and capable of discharging them, their work is hindered by individuals who do not come in for appointments or simply forget to return for follow-ups. In addition to building their vaccination capabilities, a group of healthcare workers in Nigeria focused their attention on calling the parents of children who needed to be immunized. This was done both two days and one day before the appointment. The phone calls were tracked and recalls were made if children missed appointments. These calls boosted vaccination rates by over 70%, showing that parents were much more likely to get their child vaccinated if they were reminded beforehand.

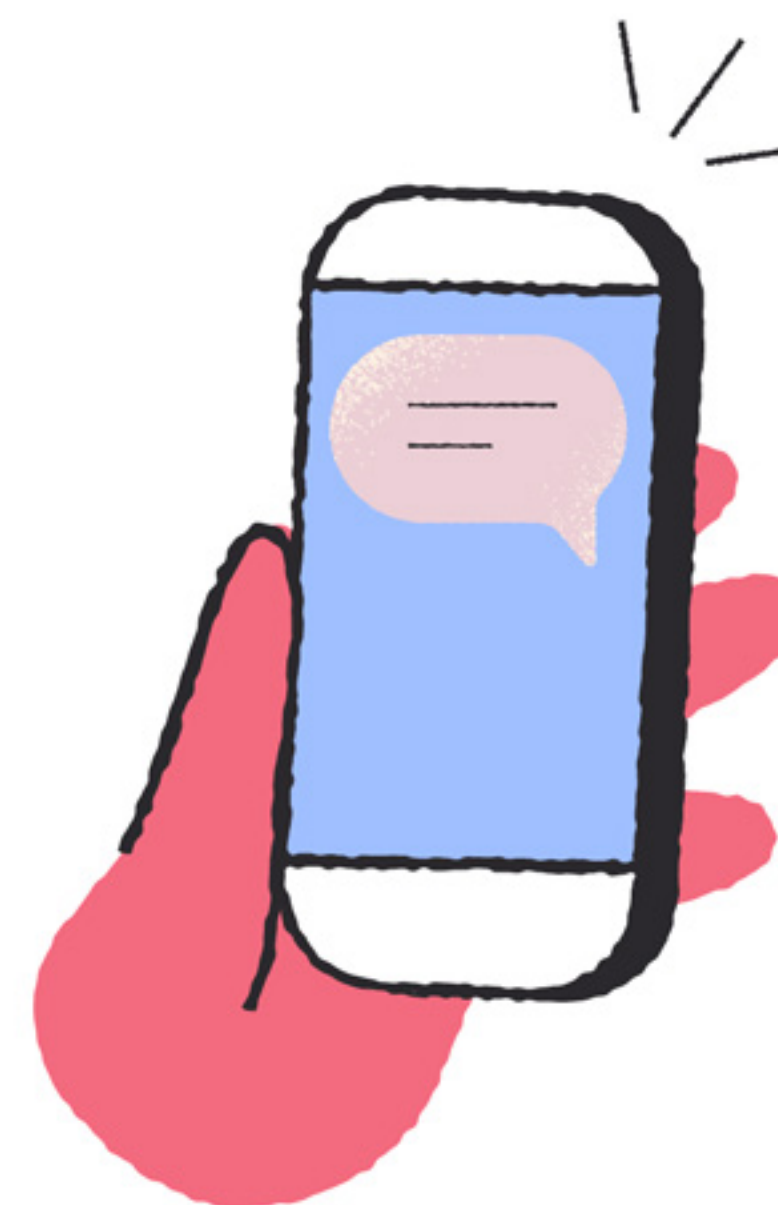
BEHAVIORAL INSIGHTS

Reminders: Reminders are a powerful way to get people to do something they're interested in but might have forgotten about. Simple text messages have proven to be effective in numerous programs and studies.

APPLICATION TO COVID

Use text messages and phone calls to remind people about scheduling appointments and showing up for these appointments. This will be especially useful for people who need to return for the second dose of the COVID-19 vaccination.

Brown, V. B., Oluwatosin, O. A., Akinyemi, J. O., & Adeyemo, A. A. (2016). Effects of community health nurse-led intervention on childhood routine immunization completion in primary health care centers in Ibadan, Nigeria. *Journal of Community Health*, 41(2), 265-273.



17.

Use signals to showcase the value of vaccination

LOCATION

Sierra Leone

BARRIERS TO OVERCOME

Social norms

Lack of determination

TARGET POPULATION

Parents with children under the age of one

EVIDENCE

Parents were given bracelets of different colors to show others in their community that they had vaccinated their child in a timely and correct manner. In some clinics, parents were able to exchange their bracelets for new ones as they completed the five prescribed vaccinations for children under one, while in others, they were allowed to pick bracelets of any color. With these bracelets, parents were able to demonstrate that they were responsible parents as well as motivate other parents to get their children vaccinated. The long-lasting nature of the bracelet also allowed the signalling to continue working for a year.

BEHAVIORAL INSIGHTS

Social signalling: Individuals feel good about themselves when they know others view them positively. In this case, parents want to indicate to other parents that they are competent and follow recommended behaviors. The bracelet is a salient way to cement their status as responsible parents in the community.

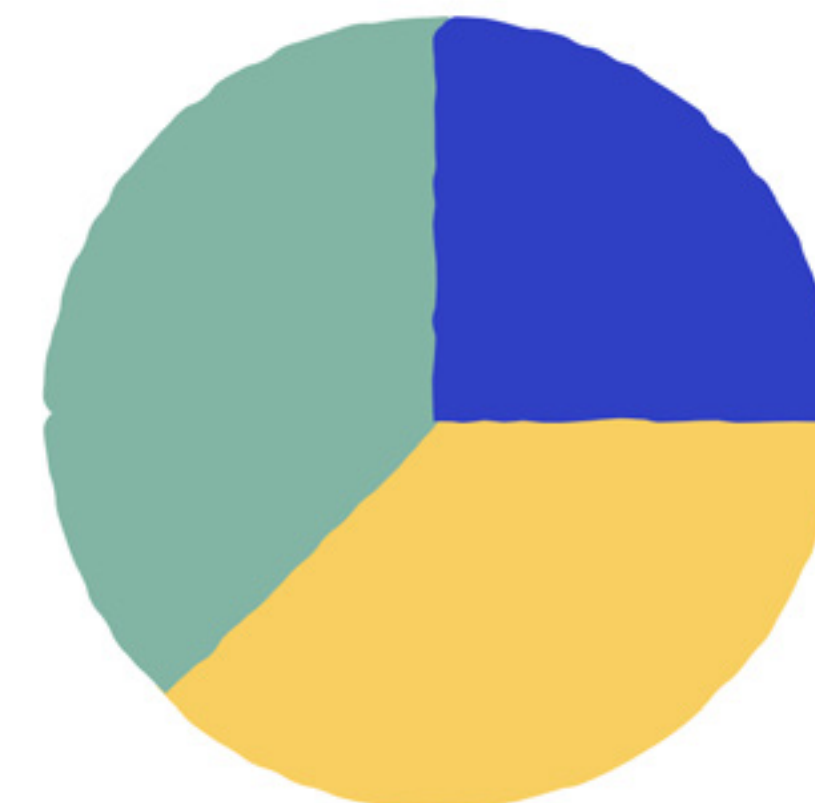
Social Proof: People are influenced by what those around them think and do. Seeing a greater number of bracelets in their community prompts hesitant parents to perceive vaccination as valuable and get their own children vaccinated.

Incentives: This study also employs incentives in the form of the bracelets. By sharing a small reward, parents were made to feel that they were doing something valuable and worth recognizing.

APPLICATION TO COVID

Since most of the COVID-19 vaccines currently require two doses, a reward or symbol of recognition might incentivize coming back for the second dose, and signal to others that they have “done the right thing.” Such signals could be in the form of pins, stickers, or low-cost jewelry. Note that if communities are not supportive of this behavior in the first place, these rewards will backfire and might stigmatize those who adhere to it.

Karing, A. (2018). Social signaling and childhood immunization: A field experiment in Sierra Leone. University of California, Berkeley.



18.

Create simple tools to track follow-up doses

LOCATION

Pakistan

Indonesia

BARRIERS TO OVERCOME

Lack of determination

Forgetfulness

TARGET POPULATION

Adults and school-going children

EVIDENCE

Immunization of children has become synonymous with immunization cards, especially for low literate or low technology environments. However, these cards might be challenging for some populations to understand. A study in Pakistan sought to tackle this barrier to complete immunization by redesigning the immunization card to only have the date of the next appointment on the front and clear boxes for essential information inside the card.

Another program in Indonesia found an increase in vaccination rates when parents were given vaccination records with next appointment highlighted to keep at home.

BEHAVIORAL INSIGHTS

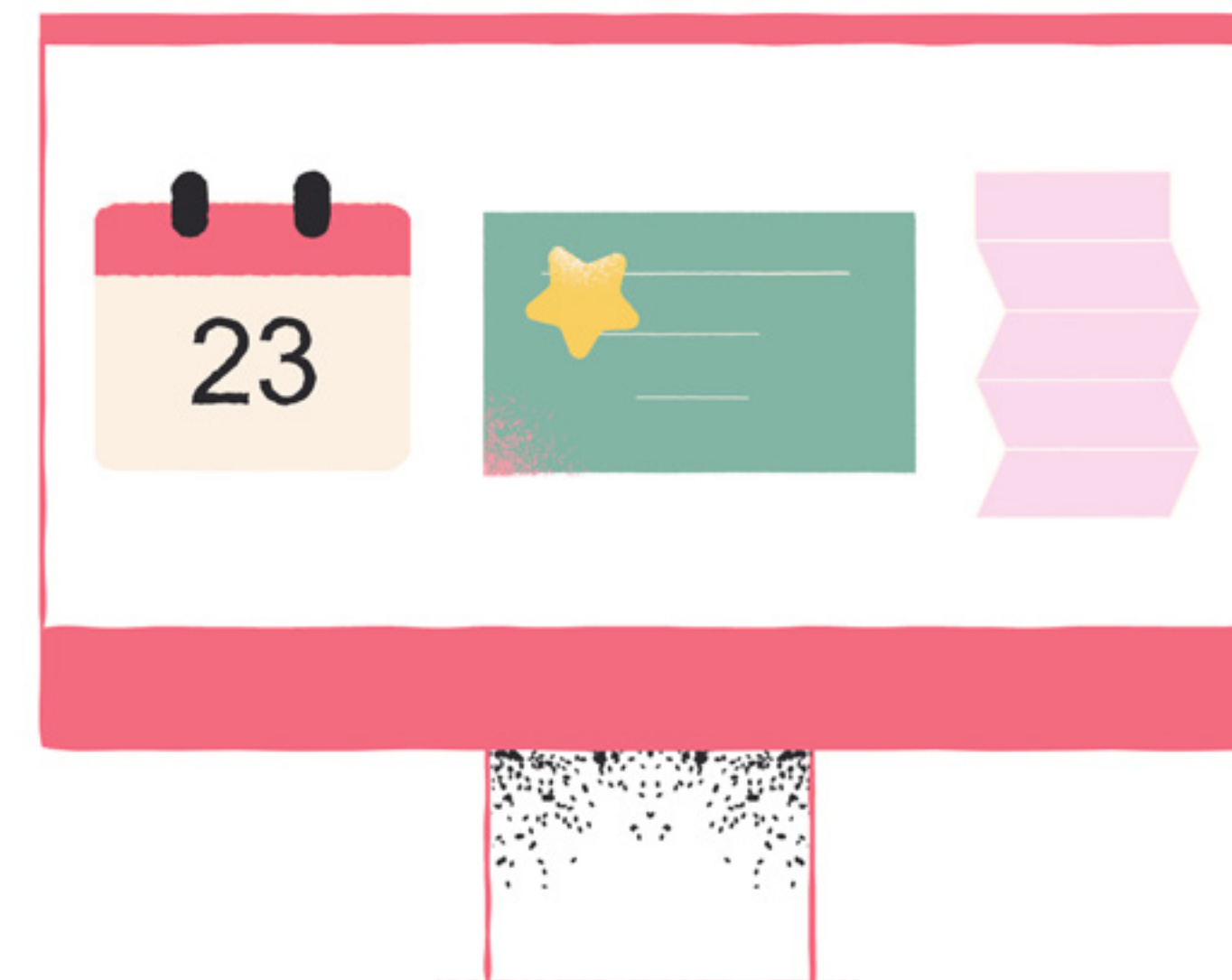
Simplification: Simplification is an effective tool to capture the essence of what an individual needs to know and clearly convey what is being asked of them. Making something easier to understand will help users take action. In this example, simplification is being used on two levels: by having an informative card and by ensuring the card is user-friendly so that people know when and where to come back.

APPLICATION TO COVID

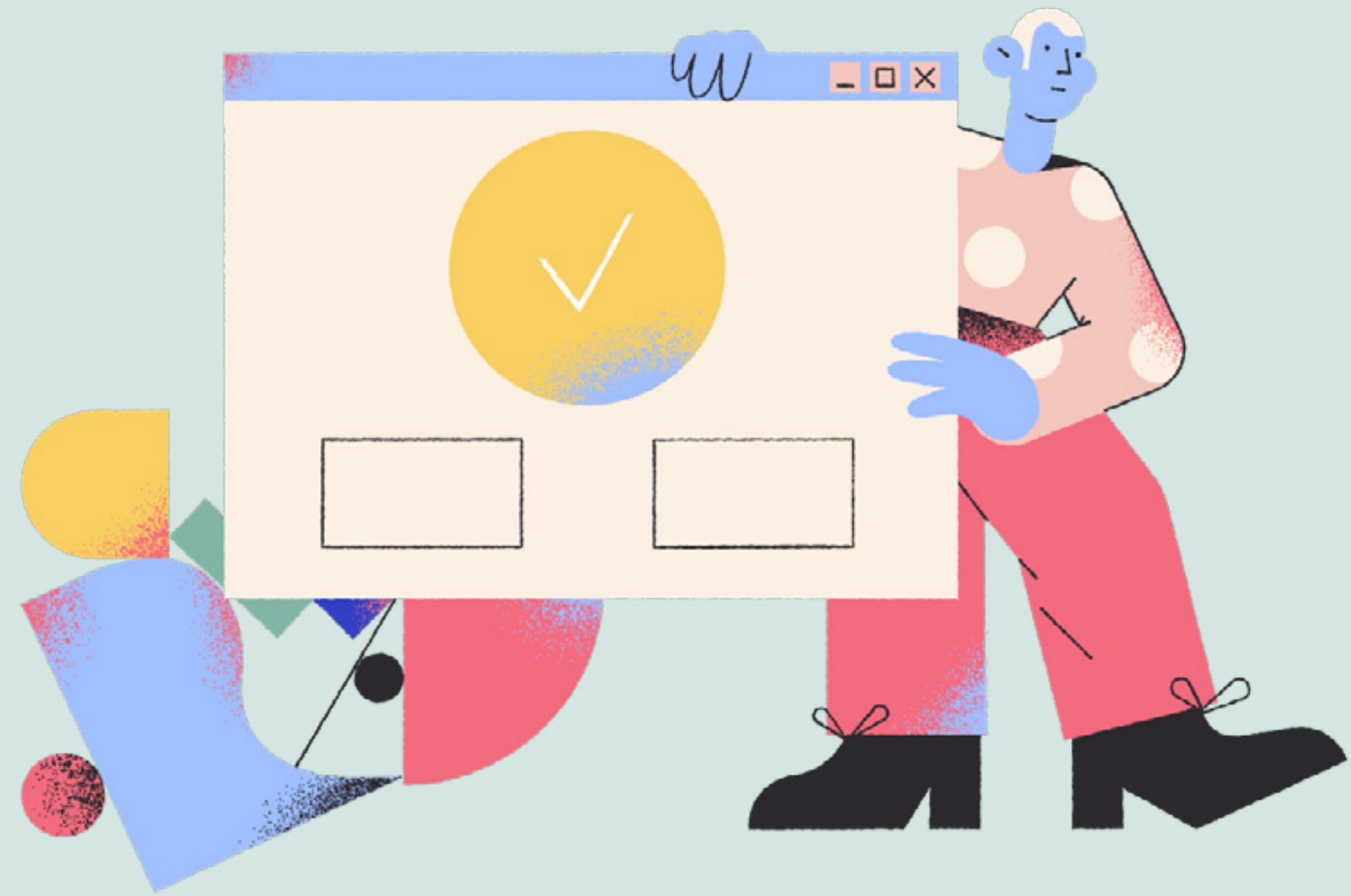
Create COVID vaccination cards that make the follow-up appointment salient and easy to find.

Usman, H. R., Rahbar, M. H., Kristensen, S., Vermund, S. H., Kirby, R. S., Habib, F., & Chamot, E. (2011). Randomized controlled trial to improve childhood immunization adherence in rural Pakistan: redesigned immunization card and maternal education. *Tropical Medicine & International Health*, 16(3), 334-342.

Wallace, A. S., Peetosutan, K., Untung, A., Ricardo, M., Yosephine, P., Wannemuehler, K., ... & Daniels, D. (2019). Home-based records and vaccination appointment stickers as parental reminders to reduce vaccination dropout in Indonesia: A cluster-randomized controlled trial. *Vaccine*, 37(45), 6814-6823.



Conclusion



Conclusion

The road to full vaccination is paved with a number of barriers. In some locations and communities, people may not have access to vaccines or might be demotivated by poor infrastructure. Many individuals face informational barriers, often not knowing how to find information they need or what to do with the information they have. And even in situations with proper access to information, some may still not get vaccinated due to a number of behavioral barriers. Each of these barriers is important to consider when formulating a vaccine rollout strategy. While addressing structural and informational barriers might seem straightforward, overcoming behavioral barriers requires a deeper understanding of the exact challenge and context.

The vaccination process contains many activities from the time of building interest in the vaccine to ensuring that people return for the second dose. This book considers the three main stages of the process: early campaign, scheduling, and follow up. By dividing the process into these stages, we are able to consider key barriers that arise at each stage and how vaccination efforts can be strengthened at each stage.

For example, informational barriers are critical to tackle during the campaigning stage as this builds momentum for scheduling and actual vaccination, while it is important to simplify scheduling processes and harness community norms to make sure people do make vaccination plans and follow through. As you think about your vaccination program, think of the various stages people need to go through to get vaccinated and what might be holding them up where they are. Knowing this is extremely helpful when choosing which behavioral insight to apply.

Behavioral insights, a toolkit of approaches from the field of behavioral science, have the potential to overcome these barriers. Simple interventions, such as pre-scheduling appointments, text message reminders, and bracelets to signal your actions to others, can be powerful ways of addressing behavioral barriers where there is interest but not enough motivation or determination to undergo a course of action. Many of the insights and examples outlined in this book can also strengthen vaccination programs at little to no cost by integrating an understanding of how people think and make decisions. While using behavioral insights, it is important to be mindful of the context the target audience lives in. What works with mothers in East Africa will not necessarily work with youth in South Asia.

We recommend that you use the Little Jab Book as a source of inspiration and ideas, but make sure to invest in understanding the populations you work with and contextualizing what you decide to do to their setting and circumstance.

Lastly, we hope you will reach out to us as you begin your vaccination program and explore The Little Jab Book's ideas, whether it is to proudly showcase how you have used behavioral insights, to brainstorm how to contextualize an intervention to your target audience, or just to ask a question. If you are inspired and want to collaborate to bring behavioral insights to your work, do not hesitate to reach out to us at the Center for Utilizing Behavioral Insights for Children (CUBIC) at Save the Children.

About us

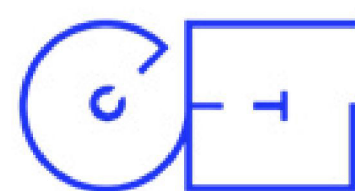


BUSARA

The Busara Center for Behavioral Economics is a research and consulting firm that applies and advances behavioral science to address the most challenging development problems in the global south. Busara works with academics, policymakers, and organizations to evaluate and implement Behavioural and social interventions. Busara has consistently improved its partners' products, programs and had policy impact across a number of sectors, including financial inclusion, health, agriculture, and governance.

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Common Thread finds human-centered solutions to the world's toughest public health problems. Our global team of team of public health specialists, behavioural scientists, designers and communicators understands that the only way to stop disease is through human behaviour.

We work with communities and those around them to design for that change.

Contact us at mike@gocommonthread.com

www.gocommonthread.com/



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Save the Children is the leading independent organization for children, working in 117 countries to ensure children survive, learn and are protected. Launched by Save the Children in April 2020, the Center for Utilizing Behavioral Insights for Children (CUBIC) is the world's first applied behavioral science team focusing specifically on the world's most marginalized children's rights and welfare. Our mission is to apply behavioral science to create positive change for children.

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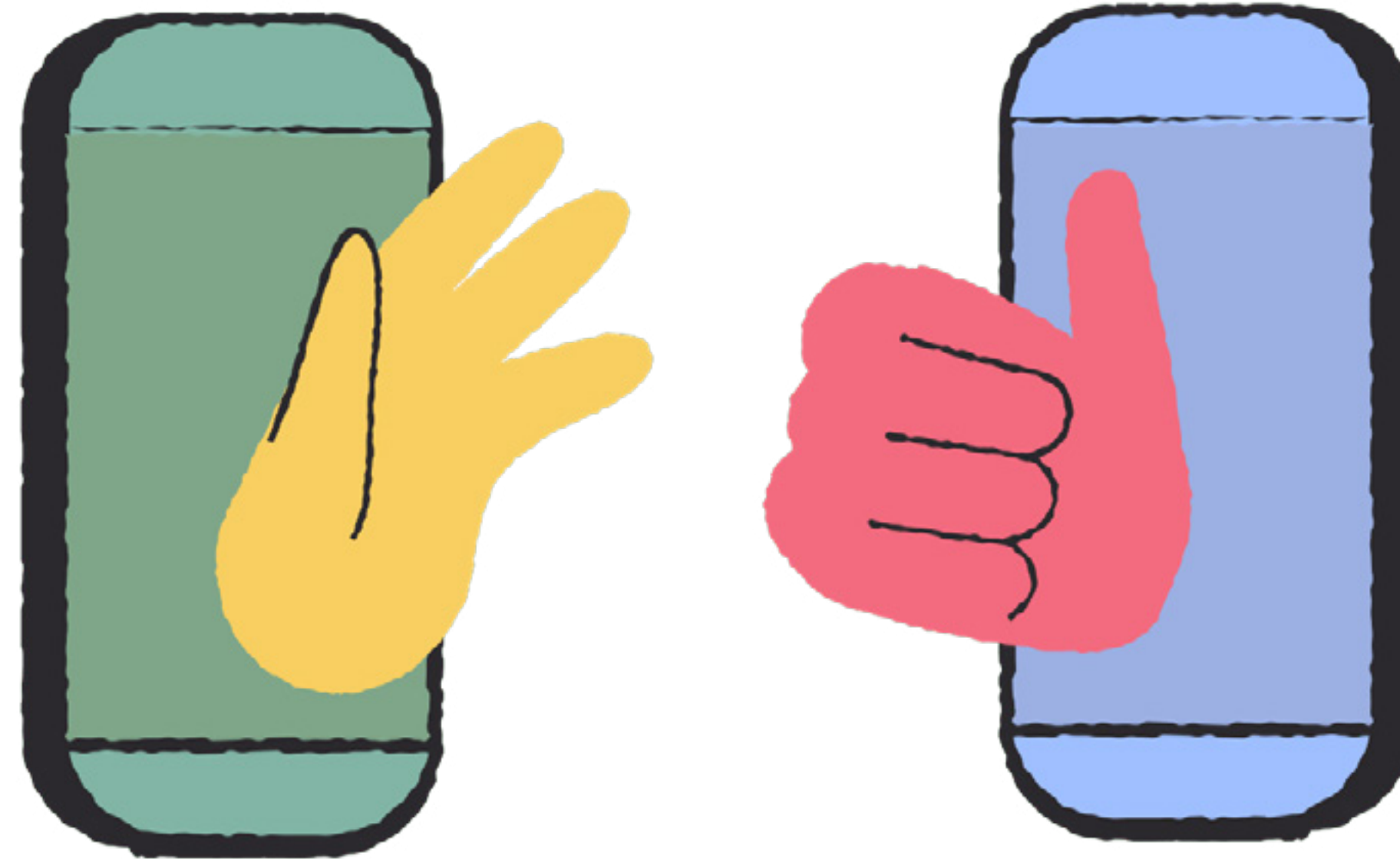
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Illustrations by Icon8



References

Andersson, N., Cockcroft, A., Ansari, N. M., Omer, K., Baloch, M., Foster, A. H., ... & Soberanis, J. L. (2009). Evidence-based discussion increases childhood vaccination uptake: a randomised cluster controlled trial of knowledge translation in Pakistan. *BMC International Health and Human Rights*, 9(1), 1-9.

Arthur, A. J., Matthews, R. J., Jagger, C., Clarke, M., Hipkin, A., & Bennison, D. P. (2002). Improving uptake of influenza vaccination among older people: a randomised controlled trial. *British journal of general practice*, 52(482), 717-722.

Banerjee, A. V., Duflo, E., Glennerster, R., & Kothari, D. (2010). Improving immunisation coverage in rural India: clustered randomised controlled evaluation of immunisation campaigns with and without incentives. *Bmj*, 340.

Brewer, N. T., Hall, M. E., Malo, T. L., Gilkey, M. B., Quinn, B., & Lathren, C. (2017). Announcements versus conversations to improve HPV vaccination coverage: a randomized trial. *Pediatrics*, 139(1).

Brown, V. B., Oluwatosin, O. A., Akinyemi, J. O., & Adeyemo, A. A. (2016). Effects of community health nurse-led intervention on childhood routine immunization completion in primary health care centers in Ibadan, Nigeria. *Journal of community health*, 41(2), 265-273.

Chapman, G. B., Li, M., Leventhal, H., & Leventhal, E. A. (2016). Default clinic appointments promote influenza vaccination uptake without a displacement effect. *Behavioral Science & Policy*, 2(2), 40-50.

Frew, P. M., Zhang, S., Saint-Victor, D. S., Schade, A. C., Benedict, S., Banan, M., ... & Omer, S. B. (2013). Influenza vaccination acceptance among diverse pregnant women and its impact on infant immunization. *Human vaccines & immunotherapeutics*, 9(12), 2591-2602.

Hershey, J. C., Asch, D. A., Thumasathit, T., Meszaros, J., & Waters, V. V. (1994). The roles of altruism, free riding, and bandwagoning in vaccination decisions. *Organizational behavior and human decision processes*, 59(2), 177-187.

Jain, M., Taneja, G., Amin, R., Steinglass, R., & Favin, M. (2015). Engaging communities with a simple tool to help increase immunization coverage. *Global Health: Science and Practice*, 3(1), 117-125.

Karing, A. (2018). Social signaling and childhood immunization: A field experiment in Sierra Leone. University of California, Berkeley.

Milkman, Katherine L., et al. "Using implementation intentions prompts to enhance influenza vaccination rates." *Proceedings of the National Academy of Sciences* 108.26 (2011): 10415-10420.

References

- Milkman, Katherine L. and Patel, Mitesh S. and Gandhi, Linnea and Graci, Heather and Gromet, Dena and Ho, Quoc Dang Hung and Kay, Joseph and Lee, Timothy and Akinola, Modupe and Beshears, John and Bogard, Jonathan and Buttenheim, Alison and Chabris, Christopher and Chapman, Gretchen B. and Choi, James J. and Dai, Hengchen and Fox, Craig R. and Goren, Amir and Hilchey, Matthew and Hmurovic, Jillian and John, Leslie and Karlan, Dean and Kim, Melanie and Laibson, David I. and Lambertson, Cait and Madrian, Brigitte C. and Meyer, Michelle N. and Modanu, Maria and Nam, Jimin and Rogers, Todd and Rondina, Renante and Saccardo, Silvia and Shermohammed, Maheen and Soman, Dilip and Sparks, Jehan and Warren, Caleb and Weber, Megan and Berman, Ron and Evans, Chalanda and Snider, Christopher and Tsukayama, Eli and Van den Bulte, Christophe and Volpp, Kevin and Duckworth, Angela, A Mega-Study of Text-Based Nudges Encouraging Patients to Get Vaccinated at an Upcoming Doctor's Appointment (January 27, 2021). Available at SSRN: <https://ssrn.com/abstract=3780267> or <http://dx.doi.org/10.2139/ssrn.3780267>
- Nzioki, J. M., Ouma, J., Ombaka, J. H., & Onyango, R. O. (2017). Community health worker interventions are key to optimal infant immunization coverage, evidence from a pretest-posttest experiment in Mwingi, Kenya. *Pan African Medical Journal*, 28(1).
- Owais, A., Hanif, B., Siddiqui, A. R., Agha, A., & Zaidi, A. K. (2011). Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomized-controlled trial in Karachi, Pakistan. *BMC public health*, 11(1), 1-8.
- Pandey, P., Sehgal, A. R., Riboud, M., Levine, D., & Goyal, M. (2007). Informing resource-poor populations and the delivery of entitled health and social services in rural India: a cluster randomized controlled trial. *Jama*, 298(16), 1867-1875.
- Prinja, S., Gupta, M., Singh, A., & Kumar, R. (2010). Effectiveness of planning and management interventions for improving age-appropriate immunization in rural India. *Bulletin of the World Health Organization*, 88, 97-103.
- Small, D. A., Loewenstein, G., & Slovic, P. (2007). Sympathy and callousness: The impact of deliberative thought on donations to identifiable and statistical victims. *Organizational Behavior and Human Decision Processes*, 102(2), 143-153.
- Usman, H. R., Rahbar, M. H., Kristensen, S., Vermund, S. H., Kirby, R. S., Habib, F., & Chamot, E. (2011). Randomized controlled trial to improve childhood immunization adherence in rural Pakistan: redesigned immunization card and maternal education. *Tropical Medicine & International Health*, 16(3), 334-342.
- Wallace, A. S., Peetosutan, K., Untung, A., Ricardo, M., Yosephine, P., Wannemuehler, K., ... & Daniels, D. (2019). Home-based records and vaccination appointment stickers as parental reminders to reduce vaccination dropout in Indonesia: A cluster-randomized controlled trial. *Vaccine*, 37(45), 6814-6823.
- Ziarnowski, K. L., Brewer, N. T., & Weber, B. (2009). Present choices, future outcomes: anticipated regret and HPV vaccination. *Preventive medicine*, 48(5), 411-414.

