“How to maintain and build trust in immunization”

- a particular challenge in face of the COVID19 Pandemic-

REPORT

Virtual Event held on December 16th, 2020

The Mérieux Foundation Vaccine Acceptance Initiative

CONTENTS

List of acronyms and abbreviations

CEPI	Coalition for Epidemic Preparedness
COVID-19	Novel Coronavirus Disease 2019
DRC	Democratic Republic of Congo
EBODAC	Ebola Vaccine Deployment, Acceptance and Compliance Programme
IFPMA	International Federation of Pharmaceutical Manufacturers and Associations
IHR	International Health Regulations
IPC	infection prevention and control
LSHTM	London School of Hygiene and Tropical Medicine
PPE	personal protective equipment
UNICEF	United Nations Children's Fund
US CDC	US Centers for Disease Control and Prevention
USAID	US Agency for International Development
VIRAT	WHO/UNICEF Vaccine Introduction Readiness Assessment Tool 2.0
WHO	World Health Organization

Note to the reader

This report condenses discussions according to the themes addressed rather than attempting a chronological account. Summaries of the discussions reflect themes emerging from wide-ranging discussions and do not necessarily imply consensus.

Summaries of presentations and of points made in discussion are presented as the opinions expressed; no judgement is implied as to their veracity or otherwise.

Background

The Mérieux Foundation Vaccine Acceptance Initiative aims to establish and maintain dialogue and increase multi-sectoral efforts to promote vaccination acceptance and increase the resilience of immunization programmes, which are facing particular challenges in the context of the ongoing pandemic of COVID-19.

The erosion in vaccination trust and additional disruptions in routine immunization programs caused by the current pandemic is becoming an increasing threat to public health. Ideas and solutions are needed in order to tackle it. As a contribution to this critical goal, the Mérieux Foundation brought together a global audience and a panel of distinguished representatives of the scientific, public health and private sectors in a three-hour webinar to discuss how to maintain and build trust in immunization in the face of the COVID-19 Pandemic.

Opening comments

***Valentina Picot**, Public Health Initiatives Lead, Vaccine Acceptance Initiative Lead, The Mérieux Foundation*

Dr Picot stressed the global prominence and strategic importance of the vaccine acceptance issue. While it has been an increasingly relevant topic for years, the context of the COVID-19 pandemic and the imminent (at the time of the meeting) rollout of COVID-19 vaccines have provided a significant recent boost in profile and momentum.

In this context, the Mérieux Foundation and its partners and colleagues are working to create heightened awareness at every level of the critical importance of vaccine acceptance.

Dr Picot opened proceedings by thanking the panellists and the 400-plus people who joined the meeting from continents all around the world.

Understanding the impact of the pandemic on vaccine confidence and immunization

***Lisa Menning**, World Health Organization (WHO)*

When a disaster such as a pandemic happens, there is a psychological response: people react emotionally, and with denial, fear and anxiety. This spills into public health in various ways, affecting health behaviours including reactions to immunization programmes.

In a serious crisis, people in communities around the world take in, process and act on information differently, thinking, feeling and behaving in different and new ways—thereby complicating broader strategies to encourage the right behaviours in response to the pandemic. In this context, the correct messages, delivered at the right time to the right people, can save lives. These considerations are at the heart of WHO's work to support and sustain immunization programmes.

Dr Menning presented the results of a May 2020 survey of the impact of COVID-19 on immunization programmes more broadly. All regions and countries have experienced some level of disruption or suspension of immunization programmes, and there has not yet been a recovery to pre-pandemic levels. WHO is working to understand why this is happening and how best to respond. Most recent data—gathered in partnership with WHO regional and country offices—looking at campaigns postponed throughout the year, shows that postponements have mainly affected countries in Africa, Asia and Latin America. 45 countries have had at least one vaccination campaign for a vaccine-preventable disease postponed. WHO has been working on guidance to remedy this, especially for catch up campaigns.

At the heart of disruptions, demand-related issues have included concerns about COVID-19 exposure during campaigns, lockdowns and social distancing policies; a lack of awareness of continuity vaccination services; fears and concerns related to mis- and disinformation; a lack of motivation among staff; and shortfalls in PPE, training, staff and capacity.

There have been a number of key learning points around what is needed to resume campaigns. Well-coordinated, transparent decision-making processes based on risk/benefit analysis are key. Strong partnerships at all levels, from national to local, are important too, as are high-quality pre-campaign briefings on infection prevention and control (IPC) measures and the use of personal protective equipment (PPE) and engagement with community stakeholders to support uptake. High quality support and supervision allow corrective adjustments in real time. There are also great opportunities for innovation in the current context—for example, by using the same personnel for pre-campaign community mobilization and vaccine delivery.

The world has changed, and the resultant “new normal” requires us all to work together, engaging beyond traditional immunization partners to work with different sectors of society around vaccination and public health. WHO has published evidence-based guidance on the importance of “whole of society” approaches and working across sectors to support vaccinations.

Recent months have seen the publication of many surveys of attitudes to COVID-19 vaccines. There are wide variations in results, between countries and over time, but these data must be interpreted with caution. Data on intentions may give a good impression of acceptance, but intentions do not predict behaviour and can change over time as new information is available. Practical factors such as ease and convenience of access have significant effects on pathways from intention to actual vaccination. Media reporting of such surveys can also have downsides, stigmatising those with genuine hesitancy and running the risk, when reporting low rates of intention, of establishing new and damaging social norms.

A number of principles lie at the heart of WHO’s strategies for working with others to drive uptake of COVID-19 vaccines. These include the importance of securing political and community support for vaccination; the collection and use of local data; the application of evidence-based behavioural strategies; targeting communications and community engagement; building capacity and strengthening health systems; and integrating immunization efforts with broader plans.

To help prepare for rollout, WHO is working with a working group of demand partners in the

access to COVID-19 tools accelerator jointly established by WHO, Gavi and CEPI, the Coalition for Epidemic Preparedness. The demand group is a cross partner development group including civil society representatives and organizations such as UNICEF, the US Centers for Disease Control and Prevention (US CDC), the Bill and Melinda Gates Foundation, and the US Agency for International Development (USAID) to generate tools to aid country readiness. Functional areas on which partners are collaborating include communication, advocacy, training, data and monitoring, coordination, implementation and guidance, delivery costing, innovation and scaling up. A wide range of resources to support vaccination is available at www.who.int.

Two crucial resources for helping countries get ready are the WHO/UNICEF Vaccine Introduction Readiness Assessment Tool 2.0 (VIRAT), and the WHO Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines, which was developed through a borad multipartner collaboration.

In conclusion, COVID-19 has created many new challenges for vaccination programmes. Continuity of services has been damaged and this has to be remedied. New strategies are needed to expand vaccination to full protection. Safeguarding domestic financing is a key concern, with many new demands on funding, and there is a need to build on routine vaccine platforms to roll out COVID vaccines. Ways to approach these challenges include through new collaborations; by maximizing the new value and profile accorded to public health over the last year; and through innovation, including new ways of working.

A brief period of open discussion covered a number of additional themes.

While COVID-19 has affected vaccine delivery, it might also have created a more positive environment for vaccine demand. There have been many hurdles to overcome in delivering safe services during the pandemic, but people do now have a better understanding of and appreciation for health and the value of vaccination—though this depends greatly on the local context.

Some of the vaccines being rolled out now have cold chain requirements of -70 degrees, which makes them impossible to use in countries and/or contexts without the necessary cold chain capacity. Funding is available through Gavi for systems strengthening to remedy this.

Rollout forecasting depends on many changing, interrelated considerations around the scale of manufacturing, regulatory and approval steps in different contexts and the speed of national regulatory authorities; WHO's ability to prequalify vaccines or accept emergency use listings; and national decision making processes. Discussions are underway about the fair and equal allocation of vaccines around the world, but this is a work in progress and equity concerns remain.

Building resilience of immunization during the pandemic

***Margaret E. Kruk**, Professor of Health Systems, Department of Global Health and Population, Harvard TH Chan School of Public Health*

Vaccines do not exist in isolation: they are delivered by health systems and people's impressions of how much they can trust in and expect to benefit from vaccination will inevitably be affected by their existing perceptions of the health system. Users must be informed and empowered about what to expect in order to bring the right pressure for change to the system: low expectations of the health system limit impact. The way to reduce COVID-19 mortality is to marry utilization of high quality health systems with high quality vaccines.

A 2018 Lancet report defined a high quality health system as a system that optimizes health by doing three things well: consistently giving care that improves or maintains health; being valued and trusted by all people; and responding to changing population needs. Measuring whether a health system is working for people entails measuring the foundations—population, governance, platforms, workforces, capacities and tools—but also, more importantly, what they *do,* as well as what they have. Good systems provide good care, continuity of that care, and good user experiences.

Current health systems, particularly in low- and middle income countries (LMICs), are underperforming. An analysis of 61 health conditions across 137 LMICs found that 8.6 million people die every year in these countries from treatable conditions. Many of these people would not die if they were treated by a higher quality health system: 60% of these deaths are among people who seek healthcare. An assessment of gold standard quality measurement, including direct observation of provider behaviour in clinics, helped clarify the reasons for this excess mortality. In many contexts, fewer than 50% of key clinical actions are done for any given sick child who enters a clinic; in some, antenatal care is performed below 60% fidelity. There are large and evident gaps between long-established internationally-known standards of care and what is actually done for people in clinics. There are also major equity gaps in quality, and the poorest are often far worse off in quality of care terms. Quality is a constraint to health systems already, but this is likely to become more problematic as time goes on: people's health needs are increasingly great and complex, but clinics in LMICs were not designed to take care of complex problems.

Recent successes—declines in global child mortality or HIV/AIDS deaths, for example—have reduced mortality rates and made the next tranche of improvements harder, emphasizing the importance of quality of care. Expectations are rising in every country: people have cellphones and social media and are no longer content with rudimentary standards of local care. There are large and growing gaps between aspiration and reality.

Improvements to health systems require a movement from a micro perspective of facility-level improvement, behaviour change and short-term, local, project-based initiatives to a macro perspective of systems-level strengthening and long-term, large-scale, nationally-led change to the foundations of health systems. Four universal actions can guide improvement: governing health systems with quality as the main concern; modernizing health services education; redesigning service delivery; and igniting demand.

COVID has shown that we can shift how services are delivered very quickly, but what is now needed is a more considered, longer-term shift that has quality concerns at its heart. This requires new ways of measuring systems – measuring "what matters, when it matters." This means looking at functions, not inputs, and focusing on the competence of systems and providers rather than simply buildings and numbers. Real time health system quality dashboards can make crucial information public about how health systems cope in both normal and crisis times, conveying data in a comprehensible way. It is important to measure and monitor people's voices and values—their user experiences, and the function (not presence) of feedback channels.

High quality health systems are resilient: they have to prepare for and respond to crises as well as adapt to them; maintain core functions when a crisis hits; and reorganize if the conditions require it. New York Times data on how health systems are dealing with COVID-19 reveals excess mortality from other causes. This shows that health systems are failing to maintain core services under the pressure of the pandemic. Resilience is a function of awareness of threats, strengths, weaknesses and resources; the ability to address multiple health problems; effective integration and coordination between the elements of the system; the ability to self-regulate; and adaptability to circumstances, evidence and feedback.

As the COVID pandemic continues, and while there are many positive points to the response so far (the rapid development of vaccines, for example) an assessment of failures and weaknesses shows how notably we have failed to learn many of the lessons of the past, and how poor coordination, integration and messaging are rife around the world.

A brief period of open discussion covered a number of additional themes. Specific country-level tools do exist to measure the capacity of health systems: a resilience index has been published (see https://www.bmj.com/content/357/bmj.j2323) and a range of tools has been developed to measure resilience. In general, there is a need to move beyond the framework of the International Health Regulations (IHR) and public health to include all of the health system in these measurements.

Measurements of systems performance must take communities into account: health systems only work when they both work with and benefit the people. The Ebola crisis in Liberia, for example, was only effectively countered when communities rose up against it. Critical vaccine hesitancy questions must be addressed at the levels at which they arise. Respectful, considerate communication is critical.

How to build vaccine confidence in crisis situations

***Heidi J. Larson**, Professor of Anthropology and Risk Director, the Vaccine Confidence Project, London School of Hygiene and Tropical Medicine*

There are different kinds of crisis, including outbreaks, natural disasters, conflicts and other human-made confidence crises, and there are complex situations entailing multiple different crises. Each situation, or combination of situations, has different implications.

The Vaccine Confidence Project looks at confidence in vaccines and their providers, and in the trust networks and systems relevant to their acceptance and delivery. COVID-19 has affected this work in a number of ways, and now that vaccine rollout Is beginning issues of equity and access are increasingly important.

Background crises matter, because they affect public trust. Historical contexts, settings and risk situations significantly affect how people react to new crises when they erupt; so when new COVID-19 vaccines are rolled out—and there will be multiple vaccines with different profiles, dosing regimes and requirements—it will be necessary to anticipate and map the settings for campaigns in order to tailor confidence building and support work properly. In many contexts, vaccine hesitancy will be as much to do with confidence in, and relationships with, health authorities as it will be to do with the vaccine itself.

Vaccine confidence has been an issue in a number of countries, but can change. It will be important to anticipate the amount of work that will be needed in order to build confidence with relatively limited information about new vaccine candidates. A common concern around COVID vaccines has been to do with the rapid pace of development. This at least can be countered with the fact that hundreds of thousands of people in trials around the world have already taken the vaccine—public recipients will not in any meaningful sense be the first.

Mapping of vaccine confidence, safety, effectiveness and importance around the world shows confidence to be extremely volatile. In 2015, Europe was the most sceptical region in terms of vaccine confidence and belief in safety; in reaction to this finding and to a spate of measles outbreaks, there was additional effort across the EU, through WHO and nationally, to take action. By 2018 this had borne fruit in increased confidence. One other trend notable from this mapping is that language diasporas are highly influential, and tend to reflect “sentiment diasporas;” for example, French vaccine scepticism (traditionally high) is reflected in growing mistrust across Francophone Africa.

Multiple issues in vaccine confidence in times of crisis. There has been a great deal of COVID denialism, for example, similar to historical experiences with AIDS and Ebola, and politicians have stoked these issues around the world even from the very highest levels. Uncertainty and rumours are rife, and extreme care is needed in approaching issues of mis- and disinformation. A lot of misinformation is subtle and contains half-truths that make it very difficult to counter. It can be highly effective: a study in the USA and the UK showed a drop in willingness to take a COVID-19 vaccine after exposure to the top five circulating pieces of misinformation. Current willingness surveys show many populations’ willingness to be vaccinated to be hovering around the theoretical herd immunity line, so even small changes in sentiment are

strategically important. The COVID vaccine will be a two-dose regime, increasing the complexity and difficulty of managing attitudes around it.

A 2017 scenario planning exercise revealed a number of relevant pandemic preparedness issues, including around how authorities adapt their messages for greater effect; how health authorities balance scientific explanations for vaccine allocation frameworks with more human acknowledgement of public distress; setting public expectations about outbreaks, vaccine supply and evolving knowledge of risks and benefits; devising strategies to address the outrage of lower priority vaccine groups; and building the right outreach and partnership strategies.

Finally, echoing previous speakers, we must always remember that other core activities are at risk while we deal with COVID-19, and working on making these services more resilient can help reinforce a sense of normality in an uncertain environment.

A brief period of open discussion questioned why it is that emotions are so much more effective in determining behaviour than facts, and how this can be addressed. As a community we have been simplistic in dividing fact and emotion, which has been a mistake: really, they are deeply interrelated, and the emotional determinants of health are many. After all, emotions have been developed to keep us alive. Work with neurologists has shown that presentation of facts is very important: neither emotion nor fact is very effective alone; rather they should be considered together. Misinformation with incomplete snippets of science in it is far more effective than a direct appeal to emotion. It was suggesting that changing the language around vaccine development might help—for example, COVID vaccines have not been developed “in a rush,” but rather “as a priority.” Science should be celebrating the reasons for this speed: there has not been enough talk about the novel technology and funding mechanisms and learning that have allowed things to be done so quickly. Work on semantics can be valuable, but has not been prioritised enough so far: the scientific community has to date failed in a lot of its communication.

COVID-19 vaccine development and the complex job of meeting global demand

***Thomas B Cueni**, Director General, International Federation of Pharmaceutical Manufacturers and Associations (IFPMA)*

A week before the meeting, the British press celebrated the first official COVID vaccine publicly delivered, allowing the patient, Margaret Keenan, to describe her joy at receiving the first dose. Such an approach can help create and maintain vaccine confidence.

From the point of view of the global biopharmaceutical industry, given the scale of the crisis, there has been a huge sense of responsibility and duty around coronavirus. The industry has acknowledged the responsibility to find new treatments and repurpose existing ones; to share real time clinical trial data with governments and between companies; to accelerate vaccine research and development; to develop diagnostic testing and ensure continuous supply; to secure essential supplies for medicines and vaccines; to increase and share manufacturing capacity; and to support global healthcare systems. As early as March 2020 the industry

addressed its role in responding to COVID-19. Even then it was known that the most likely outcome would be to have about half a dozen known companies, with decades of experience in vaccine manufacturing and development and scale-up, that would move to prioritise COVID work with unprecedented speed; and that is what they did. There was a lot of scepticism that such a traditionally competitive industry could collaborate to this extent, but it has happened and continues to happen. Companies are coming together and sharing manufacturing capacity to contribute to the response: the industry has "walked the walk" in terms of engagement and commitment since March 2020.

The work has not just been about science and bringing treatments, tests and vaccines to people: it is also about understanding that if vaccines are successfully developed, they must not only be available but also affordable. Solidarity is required across the board. To this end, the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA) has joined the ACT Accelerator, a new type of "end-to-end public-private partnership" designed to avoid situations in which rich countries buy up all the exiting antivirals and vaccines and leave poor countries stranded. The accelerator was designed for collaboration and partnership to speed up the development and production of, and to ensure equitable access to, new COVID-19 diagnostics, therapeutics and vaccines. Its call to action is ambitious: to manufacture two billion vaccine doses by the end of 2021; to manufacture and make available 245 million courses of therapeutics for populations in LMICs by mid 2021; and to make available 500 million diagnostic tests in LMICs by mid 2021. Science is delivering: there are already 347 candidate vaccine projects, with over 10 in Phase III clinical trials with an average of 15,083 participants per trial. Safety profiles are good and efficacy has been better than hoped.

These higher-than-expected success rates should not, however, be allowed to give the false impression that such success is always guaranteed: many of the current candidates will experience problems, and these setbacks must be communicated openly along with the positive results. Expectations must be kept realistic. Demand is likely to outstrip supply in the coming years, and solidarity will be important. The current unprecedented levels of collaboration must continue: never before, for example, have so many people volunteered for clinical trials. It is encouraging in this context that the trials to date have been done in the normal way, without a rush into highly risky challenge trials infecting healthy volunteers. One important element of maintaining vaccine trust will be to ensure that trial subjects are closely followed for years.

Realistically, there will also be huge challenges in scaling up manufacturing companies, and this needs to be communicated in a clear way as well. The unprecedented scale-up required to make 12-15 billion doses worldwide means altering facilities and hiring and training new staff. Syringes and vials have to be filled in sterile environments, packaged and shipped at the right temperatures and conditions; and fill-and-finish procedures require billions of doses, enough to overwhelm existing machinery. There can up to 450 quality control checks during the manufacturing process: the challenges are significant.

It is very important as well to ensure that healthcare workers in LMICs do not have to wait for months to be vaccinated. Invest in systems, including the required cold chains, will be needed to allow pilot campaigns. Realism is required: all countries will not get the same proportion

of vaccines at the start, and the initial aim will have to be to provide enough doses to protect healthcare workers, people with underlying conditions and the elderly—irrespective of where they live. The COVAX initiative is the vaccines pillar of the ACT-Accelerator, convened by CEPI GAVI and WHO to speed up the search for an effective vaccine for all countries. Working for global equitable access to COVID-19 vaccines, it is supporting the building of manufacturing capabilities, and buying supply, ahead of time so that 2 billion doses can be fairly distributed by the end of 2021. This initiative will be important in showing that the rich part of the world is willing to cross subsidise the poorer part. Industry is playing a key role in offering vaccines to COVAX on a not-for-profit basis or at tiered prices so that poor countries can get the doses they need. Vaccine manufacturers could make a huge amount of money if they sold these vaccines to big conglomerates; but they are selling to governments and to COVAX so that those who need it most can get it. There is a good chance of reaching the ambitious target of getting 2 billion doses to the people who need them by the end of next year; and this has only been possible with the agreement and support of manufacturers.

Even with these goals in mind, corners must not be cut. Safety must be the top priority in the development of vaccines. It is important to respect people's safety concerns, and at the same time to recognise industry's role in building and sustaining vaccine confidence by developing high quality, safe, effective vaccines and resisting political pressure to rush the process. Speed must not trump safety. No short cuts have been taken by IFPMA members in developing vaccines, despite the urgency of the pandemic. There has been openness about safety and side effects, and it is important to maintain that. IFPMA and its members are working with global organizations to inform the public, including through the COVID-19 Vaccine Confidence Digital Communication Campaign, and explain how it was that these vaccines were developed so quickly. Discussions are continuing WHO, UNICEF and others in a concerted effort to demonstrate that industry remains in partnership and solidarity with others, and will not rest until the job is done and everyone is safe.

Historic, unparalleled immunization has now begun. Country readiness and delivery is now crucial. Led by WHO, the regulatory roadmap must be prepared: waiting for every country to complete its standard national approval process will mean failing to get this done in time, so regulatory harmonization is key.

A brief period of discussion highlighted a few themes.

The accelerated regulatory and manufacturing processes being applied for COVID-19 are unlikely to become a new norm: they have required work around the clock for almost a year, at a level of intensity that will be impossible to sustain. But it should be possible to learn from the experience, to safeguard some of the team spirit, and to learn lessons for future pandemic preparedness—for example, for influenza. Organizations like CEPI and Gavi are used to working with the private sector; and now WHO has a new appreciation of the importance of its role: without it there, there would be no accelerator. Lessons should be taken for future pandemics, and industry must consider what kinds of public-private partnerships can be built in non-pandemic times to enable faster responses when pandemics do occur. mRNA vaccines and monoclonal antibodies have also provided new scientific tools for future responses.

Lessons from Ebola vaccine deployment in Africa for COVID-19 vaccine introduction consideration

***Robert Kanwagi**, Programme Coordinator, Ebola Vaccine Deployment, Acceptance and Compliance Programme*

It is possible to maintain trust in vaccine deployment programmes, as long as communities remain equal stakeholders in vaccine rollout. This was the main principle for the Ebola Vaccine Deployment, Acceptance and Compliance Programme (EBODAC), a joint initiative of the London School of Hygiene and Tropical Medicine (LSHTM), Janssen, World Vision and the Grameen Foundation. EBODAC worked to deploy vaccines in Sierra Leone, Democratic Republic of Congo (DRC), Uganda and Rwanda.

In 2014-15, when the project launched, there were a number of concerns. The Ebola outbreak was ongoing, posing challenges to full community participation and engagement. On a logistical note, there were difficulties ensuring that the right people received the right vaccines at the right times. The safety and efficacy of the vaccine raised further concerns among communities, making issues of trust central to operations. Building the capacity of frontline health workers during an epidemic while still respecting the standard operating procedures for disease and infection prevention was difficult. Finally, helping countries prepare the demand side aspects of vaccine deployments in a comprehensive, organized manner was hard, especially given the ubiquitous tendency to focus on supply side issues. EBODAC was address these questions with solutions that could support effective rollout of the vaccine.

To this end, EBODAC worked on a number of fronts: developing and implementing a community engagement strategy; developing and using identification tools for vaccine recipients; deploying mobile technology to increase reach in rural settings and keep volunteers engaged and attending clinics; piloting a mobile training and support service, delivered through cellphones, for remote community-based health workers, the backbone of the health care system at household level; developing a gap analysis tool for vaccine deployment; and sharing learning to support others (available at www.ebovac.org/ebodac). One key challenge across all this work, and a challenge that is applicable to the COVID-19 pandemic, is that of the importance of thinking critically about compliance with the second dose of a vaccine. Achieving acceptance of a first dose does not mean that people will come back for the second.

Reasons for mistrusting the Ebola vaccine were wide-ranging, and included belief it was fatally dangerous; the idea that it was designed to spread Ebola deliberately, to exterminate the population; the belief that more than one vaccine type existed, and that the one being offered to communities was ineffective; concerns about health effects for those with pre-existing conditions; concerns about immediate and long term side effects; and concerns about the experimental status of the vaccine and its effectiveness. The issue of side effects generally should not be addressed only when they happen, but when vaccines are rolled out: experience suggests that when you give people facts, they tend to be willing to accept them.

EBODAC's work has revealed a number of lessons that can be organized into different themes.

On the communication front, addressing concerns around vaccination and mistrust requires explaining the importance of the vaccine and of coverage; speaking openly about side effects and allowing people to ask questions; talking about other routine vaccines, such as cholera, polio, tuberculosis, etc.; ensuring that healthcare workers understand how the vaccine works, and that they trust it; working with community leaders and influencers on vaccine acceptance; and reinforcing immunization teams with detailed information and answers to common questions. It is critically important that teams can answer questions immediately as they carry out their work.

For risk communication and community engagement, it is important to consider possibilities for remote training and capacity building during rollout. Communication and messaging must be properly complemented by actively listening to communities to build understanding of what they are experiencing and feeling—it helps to have people with distinct, specific listening roles alongside the communicators. As previously stressed compliance and retention must be addressed to ensure that people receive their second doses. It is also important to address people's virtual and online communities as well as their physical ones, and a media engagement strategy is a necessity. Social science should be an ongoing process throughout, not something done just prior to rollout. The effective use of technology is centrally important in all its aspects, whether it be for data management; using biometrics to identify recipients; remote engagement and training; scheduling automated reminders to ensure attendance at vaccination appointments; cold chain management; or something else.

A few cross cutting themes emerged from EBODAC's work, too. It is important to invest in understanding specific safeguarding issues in communities, particularly around the influence of cultural and social structures on vaccination decision-making. Social accountability is integral to risk communication, and gender and other power barriers to access must be addressed to ensure that nobody misses out. Depending on geography, there may also be an important need for cross-border coordination, particularly in areas with large commercial and trading centres along borders.

Ultimately, there is no effective vaccine trial, study, rollout or campaign without good community engagement from day one. Key principles in planning for acceptance and uptake therefore include the following:

- Securing high level political support , identifying and engaging key stakeholders, influencers and champions at all levels and engaging them from the start
- Using behavioural and social data to guide planning, monitoring and evaluation, targeting of strategies and later iterations
- Establishing social listening and rumour tracking processes, and ensuring readiness to respond quickly and effectively to misinformation
- Communicating clearly and quickly, through trusted channels, using high quality content tailored to context in order to build trust and avoid communication gaps
- Engaging with communities and involving them in planning, and gathering and using feedback
- Building capacity, identifying needs early on and ensuring they are included in training curricula for health workers, influencers and mobilizers
- Integrating vaccination campaigns with broader technical plans, coordinating with a

wide range of partners and stakeholders and using existing mechanisms and groups where possible.

Panel discussion

A brief period of panel discussion allowed the speakers to address a number of questions submitted by listeners, allowing an opportunity to highlight a few more themes before the meeting closed.

Often the most strategically important person in the health system in terms of affecting individual decision-making can be an individual's own health provider. While people may have broader doubts and issues, their own physicians, primary care providers or other regular points of contact with the health system tend to be trusted individuals, and information coming from those providers is seen of higher value. These providers are therefore a key part of vaccine information and outreach strategy.

Among the most obvious parallels between Ebola and COVID-19 is the difficulty of administering a two-dose vaccine regime. This requires a compliance strategy comprising the initial mobilisation of communities to get the vaccine, followed by a deliberate, staged plan to engage them to take the second dose. To this end, there must be a continuous engagement of communities, physically and digitally, with the goal of ensuring they receive that second dose—but with regular reminders of vaccination appointments complemented by preventive messages for infection control, to avoid giving the impression that the only communication is around taking the vaccine.

In addressing concerns around vaccine safety, it is important not to cut corners, and to ensure that approval decisions continue to be left to rigorous regulators, regardless of the level of political pressure. Experts are confident that these vaccines are safe, but it is obvious that every vaccine has some side effect, and this should be communicated clearly. Rumours start easily, and there are always some allergic reactions to vaccines; when issues arise, they should be addressed openly. COVID-19 kills people; in contrast, based on trial results to date, these vaccines are very safe.

One of the principal threats to humankind in a pandemic situation can in fact be people's behaviour. Understanding how our behaviour contributes to what we do, and what we enable, is an important part of any effective public health strategy, and particularly so for vaccine acceptance.