



From Birth to Booster and Beyond: Optimizing pediatric immunization services

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Glossary

Antimicrobial resistance – Pathogens no longer respond to medicines making infections harder to treat and increasing the risk of disease spread.⁷⁵

Vaccine complacency – Consideration of vaccines as unnecessary due to one's perception of being at low risk of contracting a disease or experiencing severe disease outcomes⁵⁸

Vaccine confidence – The belief that vaccination – and by extension the providers and range of private sector and political entities behind it – serves the best health interests of the public and its constituents⁵⁹

Vaccination coverage (or uptake) – Estimated percentage of a population who have received specific vaccines⁶⁰

Health care professionals (HCPs) – A physician or other health care practitioner licensed, accredited or certified to perform specified health care services⁶¹

Health literacy – Ability to obtain, read, understand and use healthcare information in order to make appropriate health decisions and follow instructions for treatment⁶²

Messaging fatigue – A state of being exhausted or overwhelmed by prolonged exposure to similarly-themed messages⁶³

MMR vaccine – A combination vaccine that protects against measles, mumps and rubella. The ECDC advises that two doses of the vaccine should be administered to protect against measles given its ability to spread, with the first administered during the second year of life.⁷⁶

MCV1 – The first dose of a measles-containing vaccine such as MMR.³

Remind and recall process – The systems in place to notify patients that their child is due for vaccination(s)⁶⁴

Vaccine fatigue – Inertia or inaction towards vaccine information or instruction due to perceived burden and burnout⁶⁵

Vaccine-preventable diseases (VPDs) – A disease for which an effective preventive vaccine exists⁶⁶

Disclaimer

The recommendations featured in this paper are based on insights shared by members of the *Strengthening the childhood immunization pathway* (SCIP) Advisory Group. The SCIP Advisory Group has been funded and organised by Pfizer Inc. Members of the advisory group are external key opinion leaders, with expertise in pediatric clinical practice, behavioral psychology, and research in the fields of immunology and vaccine confidence. Insights shared by the members have been collated into this document by Pfizer's third-party agency, Portland Communications, at the request of Pfizer. Portland Communications has undertaken limited review of the recommendations provided by the members of the SCIP by reference to publicly available research papers. The recommendations set out in this paper reflect the opinions of the relevant member of the SCIP who are leaders in their fields. Pfizer's involvement in collating this paper has been limited to directing Portland Communications to prepare the paper.

Pfizer's involvement in collating this article has been limited to requesting Portland Communications to prepare a position paper on the approach to routine immunization and an article based on this. The recommendations featured in the paper have been externally endorsed by the following organizations: European Health Management Association and Seville Institute of Pediatrics. Organizations endorsing the paper were not paid for their endorsement, nor were they involved in the development of the paper.

Executive Summary

The COVID-19 pandemic has had a devastating impact on routine immunization systems, resulting in the largest sustained decline in the uptake of routine childhood immunizations for 30 years.¹³ The pandemic has highlighted long-standing system gaps: low confidence amongst patients and HCPs,¹ poor access to vaccination services,³⁷ lack of trust in HCPs and health authorities.¹ These gaps will remain vulnerable to similar shocks during future pandemics if action is not taken now. This has been further evidenced by the resurgence of polio in the UK and US,⁷³ a disease that was once close to global eradication. Given the unprecedented level of public interest in vaccination and the prioritization of pandemic preparedness on the global health agenda, now is an opportune moment for governments to reassess their routine vaccination systems.

The policy recommendations in this position paper have therefore been developed to help policymakers, health system leaders and vaccinating HCPs identify and implement the basic elements required to strengthen vaccination systems. Building upon existing literature and European-level policy directives on the subject, implementation of these recommendations will enable the incremental increase of coverage rates to achieve the WHO 95% target or beyond. This will ensure that systems remain resilient in the face of future health crises.

This position paper was developed following several individual and group consultations with members of the *Strengthening the Childhood Immunization Pathway (SCIP)*. The insights shared, based on their broad global expertise in pediatric vaccination and immunology, were used to develop a set of recommendations, that if implemented, can help increase the effectiveness of immunization systems.

Recommendations

The following core elements underlie a robust approach for an effective immunization service, aligning with the WHO's behavioural and social drivers (BeSD) of vaccine uptake⁷⁷:

HCP training	To effectively communicate the importance and safety of vaccination, build HCP confidence, and equip HCPs to sufficiently answer patient questions, HCPs should be provided with communication training
Information	To ensure vaccine information on safety, efficacy and accessibility reaches all communities within a population and is understood, the ideal nature and timing of the provision of pediatric vaccine information to parents should be identified
Data and surveillance	Systems should have the basic functionalities necessary to ensure they can be used efficiently at the HCP-level to identify patients and record vaccinations, and more broadly, to identify patterns of low coverage within a community and determine where interventions should be targeted
Remind and recall process	To ensure families do not fall behind on their vaccinations and remind them of the national (or regional) schedule, the optimal nature of outreach to families due for vaccinations should be identified
HCP conversations	To avoid patients referring to less credible sources of vaccine information, the ideal nature of conversations between HCPs and parents during vaccination appointments should be established to build trust and reinforce confidence and the importance of vaccination
Accessibility	To avoid missed or late vaccination due to systemic challenges, methods to increase patient access to vaccination appointments should be identified, in terms of location, timing, capacity and administration

These elements are underpinned by the following factors:

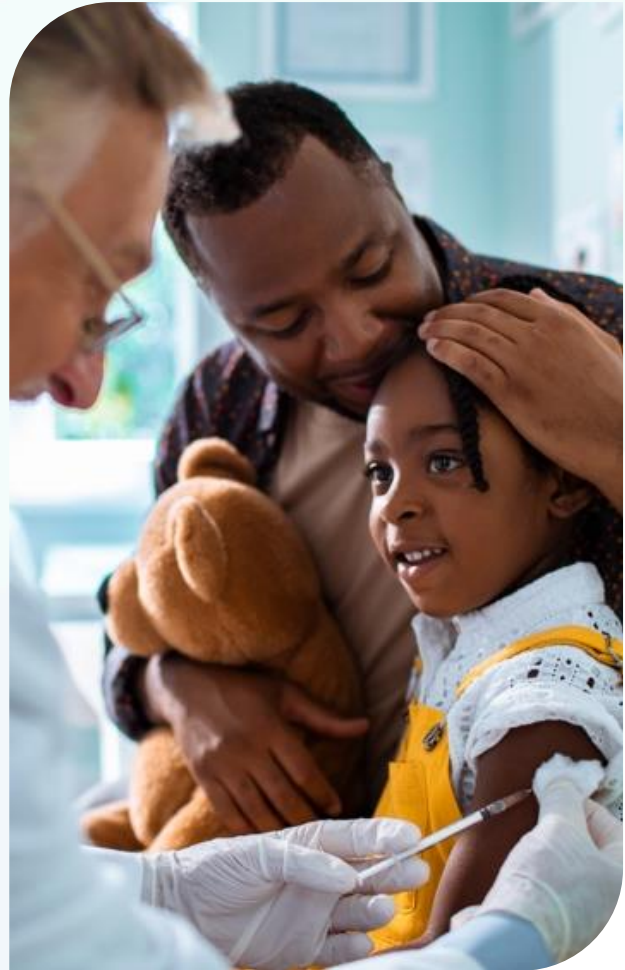
Policy enforcement and efficacy	Data should be leveraged to evaluate the efficacy of pediatric vaccination policy, and inform further changes to policy to target areas of low coverage
Funding	The required funding should be calculated and allocated to support the execution of an effective immunization system
Vaccine complacency and fatigue	To maintain the public's willingness to receive routine immunizations, overcoming vaccine complacency amongst the general public and HCPs will be necessary, especially during the COVID-19 pandemic
Vaccine confidence	To address low coverage driven by vaccine hesitancy amongst patients, interventions are required to improve vaccine confidence
Social media	To help counter anti-vaccination messaging and the damaging effect this has on confidence, social media should be harnessed to assess public attitudes towards vaccination and reinforce public health messaging

Overview

This position paper sets out a clear approach to optimize routine pediatric immunization that has been endorsed by leading experts from around the world. The paper is designed to help policymakers and health system leaders identify and address barriers to uptake that may be present within systems.

Position Statement

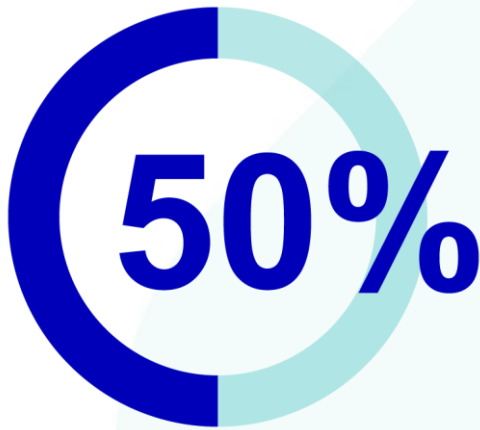
There is an urgent need for policymakers and health system leaders to take an immediate and proactive approach to improving routine childhood immunization services globally, including across Europe. Over the past decade, there has been an observable decline in vaccine confidence¹ and an increase in vaccine complacency². This is despite the availability of cost-efficient, highly effective vaccines.⁷⁰ With renewed understanding of the importance of averting vaccine-preventable diseases (VPDs), now is the time for all countries to prioritize routine immunization in line with the WHO's 95% coverage target ahead of 2030. Key actors in routine immunization systems should look beyond the short-term political cycle and recognize the need to invest in more efficient and effective routine immunization services and adopt a preventative approach to healthcare, to improve public health. This position paper uses learnings from different applications of routine vaccination policy to set out recommendations that will help strengthen immunization services. The elements that determine the efficacy of immunization pathways are often underpinned by a series of determinants that feed into all parts of the service. Whilst it is strongly advised that all recommendations should be implemented, the local context should determine which recommendations should be prioritized.



Introduction

After clean water, vaccinations remain the most effective public health intervention in the world, promoting good health, preventing over 50 million deaths globally in the 21st century alone.^{67,68} However, prior to the pandemic, there was a worrying decline in routine pediatric immunization rates globally. This was the case in Europe, where MCV1 rates had decreased in 12 EU member states since 2010.³ In 2019, the WHO announced that four European countries lost their measles elimination status due to continuous transmission of the disease amongst communities. This indicated a larger problem at hand, given the ease with which the measles virus is able to spread.⁴ Vaccine confidence, an essential driver of vaccination uptake, has also declined in the EU since 2020 - reduced support for childhood immunization has been observed across western and eastern Europe specifically.^{5,78} Vaccine confidence has been further challenged by the COVID-19 pandemic, due to the amplification of an anti-vaccination narrative, vaccine passport policies,⁶⁹ and most importantly, the polarisation of groups with different levels of confidence in routine vaccinations pre-pandemic. For populations with low confidence pre-pandemic, COVID-19 has not helped improve confidence. However, for populations with greater levels of confidence pre-pandemic, greater acceptance of routine immunization has been observed as an effect of the pandemic.^{78,69} This effect has been most prominent amongst younger populations.

The Defeating Meningitis by 2030 Roadmap sets a goal of reducing cases of vaccine-preventable bacterial meningitis by:



systems and infrastructure by governments. However, vaccine fatigue remains a looming threat, increasing the risk of lowering immunization rates and in turn futhering of VPD transmission. Political interest in the impact of antimicrobial resistance on the spread of infectious diseases also continues to grow.⁷¹ Vaccines continue to be an important tool to address this by reducing inappropriate use of antimicrobials to treat infectious diseases and their associated costs.⁷² With this in mind, now is a providential moment for governments to reassess their routine vaccination systems. As stated by the WHO and UNICEF, countries must ensure that improving coverage rates is a key priority for action at a global political level and for public health platforms in 2022 and beyond. This includes the G7, G20 and World Health Assembly.¹⁰ Efforts should not focus solely on recovering disrupted programs but should also look to invest in, and strengthen, vaccination systems for the future, starting with pediatric services.¹¹ It is not sufficient to aim for a national average of 95% coverage, instead, 95% coverage levels should be reached at community levels, to protect against the most infectious diseases such as measles. Inconsistent coverage has the potential to cause outbreaks in areas of low coverage to bleeding into surrounding communities. System resilience must therefore be built from the community level up to achieve 95% in all areas, to secure herd immunity.⁷⁹ Among the global community, there is a clear consensus about the need to prioritize routine immunization systems. This not only applies to countries with low to middle vaccination rates, but to countries where rates are relatively high. There is a recognized need to improve systems to ensure all countries can reach 95% coverage, helping prevent the spread of serious infectious diseases.

In response to these challenges and opportunities, this position paper sets out a robust approach to routine immunization. The paper outlines key policy recommendations that, when implemented, will help to improve countries' vaccination systems and support them in reaching 95% uptake rates for pediatric routine immunization, both nationally and across regional and sub-national divisions.⁴

The WHO's recommendation for global routine pediatric immunization coverage is 95%. Yet, coverage in a large proportion of countries, including in high income European nations, falls short of this target, with high variability across the European region.⁷ This is despite vaccinations being one of the most cost-efficient health interventions.⁷⁰ To realize the full benefits of immunization, the Immunization Agenda 2030 sets the direction for a world where everyone, everywhere, at every age, fully benefits from vaccines to help improve health and well-being. One of the three key goals is ensuring good health for everyone by strengthening immunization within primary health care and contributing to universal health coverage.⁸ In parallel, the Defeating Meningitis by 2030 Roadmap sets out a comprehensive vision towards a world free of meningitis, with the goal of reducing cases of vaccine-preventable bacterial meningitis by 50% and deaths by 70%. To do so, the roadmap advises prevention through the development of new vaccines and achievement of high immunization coverage.⁹

As a result of the COVID-19 pandemic, there is renewed public interest in vaccination, and greater investment in

Environmental context

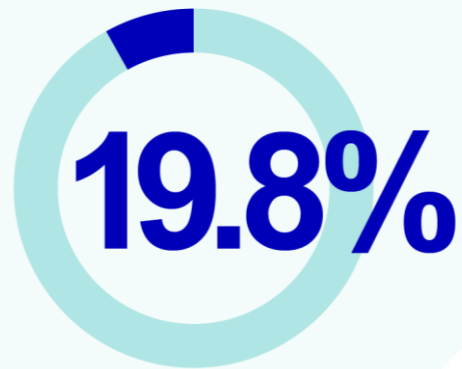
Pediatric vaccination services faced wide-spread disruptions as countries have continued to address the COVID-19 pandemic, with appointments being postponed and the limited capacity of HCPs able to deliver vaccines.¹² New data now indicates the largest sustained global decline in the uptake of routine childhood immunizations for 30 years as a result of the pandemic.¹³ Due to pandemic-related disruptions, high income countries have seen the estimated number of missed routine doses increase over two-fold relative to other regions.¹⁴ For example, in the UK during the first three weeks of the first wave of the pandemic, measles, mumps and rubella (MMR) vaccination counts were 19.8% lower than for the same period in 2019.¹⁵

Despite this, the pandemic led to unprecedented public interest in vaccines, with a particular focus in their regulatory review and safety monitoring.⁷ Whilst there has been some increased scrutiny, positive attitudes towards COVID-19 vaccines have arguably had a halo effect on other vaccines. It was found that in 2020 across 13 EU countries, a higher proportion of the public believed the MMR vaccine to be safe and/or important than in 2018.¹⁶ However, recent research indicates that confidence has reversed to levels observed in 2018 following the peak of the pandemic.⁷⁸ Therefore, there is a need to refocus on vaccine confidence-building efforts.

However, the potential to negatively affect perceptions and willingness to receive routine immunizations remains a risk.¹⁷ Health literacy is a crucial tool in the prevention of communicable diseases and is positively correlated with vaccine acceptance and the detection of fake news.¹⁸ Low health literacy has been a direct contributor to the spread of COVID-19 related online misinformation.¹⁹ This has highlighted the need to better the public's ability to detect misinformation through improved education.

As we enter the third winter of the COVID-19 pandemic, vaccination fatigue risks having a cascading effect on wider vaccination efforts, with increasing distrust of authorities and decreased threat perception components (such as concern or fear of contracting the disease).²⁰ As a result, the public's perception of infectious disease risk overall has reduced, making them less inclined to seek vaccine information and/ or administration.⁷⁸ As vaccination rates decline, there is a risk of disease outbreak, demonstrated by the resurgence of the polio virus in the UK and the US, with the first case of polio diagnosed in the US for almost a decade.⁷³ Vaccine fatigue is not limited to the public, however, as vaccinating healthcare professionals (HCPs) experience burnout due to the pandemic and their ongoing duty to motivate people to vaccinate. This evidences the need for further investment to support expansive, proactive immunization strategies, including more effective and empathetic vaccine communications.²¹

Compared to 2019, MMR vaccination counts during the first 3 weeks of physical distancing fell by:



Robust approach – Overview

The robust approach set out in this paper. The approach was developed based on insights from discussions with an advisory group with professional experience as pediatricians and professionals in the fields of behavioral medicine, vaccine confidence and infectious diseases (further details on the SCIP Advisory Group can be found in the Annex). As countries already look to optimize their vaccination systems to ensure continued access to routine immunization during the COVID-19 pandemic, this approach looks holistically at how the different factors involved in vaccination systems can be modified, with the aim of helping to strengthen vaccination programs and in turn, improve vaccination coverage rates to build further resilience into public health systems.

A robust approach for effective immunization

Robust immunization policies and services are made up of a series of key factors, which, in turn, improve routine pediatric immunization uptake rates. There is interplay between each of these and all are essential in achieving high levels of coverage.

HCP training

- HCPs should receive streamlined training programs to ensure that they are up to date with the latest guidance, to maximize efficiency and minimize the resource burden placed on HCPS through regular training requirements. HCPs administering vaccines should be supported, through training, to have effective conversations with parents who may have lower levels of vaccine confidence.²² Training will also help to ensure consistency in communication between different HCPs.
- Training should support HCPs to move away from paternalistic approaches to consultations and instead place a greater emphasis on joint decision-making and patient-led care.²³

Information

- Information from governments, health services and public health agencies should be clear, concise, consistent and honest, retaining only the necessary information.²⁴ To increase effectiveness, where appropriate, communications should be delivered by HCPs.²⁵
- Communications should be tailored to address language barriers, including the broad availability of translated and accessible materials.²⁶ This is particularly important in areas with low rates of literacy or areas with high migration.
- Communications should be tailored to address perceived access barriers, such as costs and availability. It is especially important to reiterate to the public where vaccinations are free at the point of patient access to help dispel perceived barriers.

Data and surveillance systems

- Data should be made available to all vaccinating HCPs to communicate patients' individual vaccination status, collective coverage rates, and current prevalence of the relevant diseases.²⁷
- This data must be centralized, internationally comparable and include real-time coverage data. Coverage data should be accessible to vaccinating HCPs in parallel with confidence data.²⁸
 - However, it should be clearly communicated to patients that all data can only be accessed by the health service. This will help avoid suspicion of data misuse by the public which could negatively impact vaccine confidence rates.
 - A single recording system should be made available to vaccinators to ensure the consistency of data collection at a national level.

- The system should be intuitive to ensure HCPs are able to record vaccinations easily and accurately.
- As part of broader efforts to address health inequalities, including differential uptake of routine vaccinations, interventions should target the relevant populations, identified using reliable data from surveillance systems as a basis.

Remind and recall processes

- Engagement and outreach strategies must be proactive.²⁹ Parents should be proactively engaged by the health system, and the systems should not rely on them taking the initiative to present to vaccination services.³⁰ In addition, this system should be one that automatically generates appointments, to minimize the burden placed on HCPs.³¹
- The health system should use a variation of communication mechanisms to maximize outreach.²² For example, notification on a mobile application, SMS messages and written letters.³²
 - However, a balance must be maintained between using multiple channels of communication while simultaneously avoiding messaging fatigue.³³ Messages should therefore be refined, geographically targeted and limited in number, to prevent messaging fatigue.

HCP-Patient interactions

- HCPs are the most important actors in the system when looking to improve the population's compliance with vaccination recommendations. They are often the most trusted source of information, making them particularly influential in a parent's decision to vaccinate their child.³⁴
- It is important that HCPs have the time to proactively engage with parents and actively listen to any hesitations that they may have, respectfully. Building trust takes time and should be ongoing beyond the first vaccination appointment. Therefore, continuous care should be provided by the same HCP where possible to help build trust between HCPs and families each time they interact and build parental confidence in vaccinations.⁸¹
- The active participation of families will help the tailoring of immunization strategies. Open and transparent conversations with their HCPs will ensure that adapting the delivery of routine pediatric immunizations at the individual or community level will actually meet patient needs.
- Within minority communities, levels of trust in institutions and health systems are commonly low, and therefore, HCPs are unlikely to be the most trusted actors. In these scenarios, third parties, such as family and friends, alongside community or religious leaders, should be leveraged as they are likely to have greater influence.³⁵
- Conversations with parents are variable depending on the family and their level of vaccine confidence. HCPs need to take a tailored and agile approach when discussing vaccine-related information with parents. HCPs must consider the following when tailoring the information, they share:
 - Parents' perceived understanding of vaccination, and their broader health literacy³⁶
 - The nature of their relationships with the parent (e.g., the length of this relationship, perceived trust of the patient in the HCP)⁸¹
 - Language and/or cultural barriers²²

Accessibility

- Appointments need to be easily accessible in terms of location and reachable via public transport.³⁷
- Appointments should be offered with low waiting times and at a variety of different times, catering for a wide range of schedules.³⁷ Appointments should be available after standard working hours and on weekends, as well as throughout the week.
- To ensure routine vaccination uptake among less advantaged and more vulnerable populations reaches levels required to achieve herd immunity, outreach services should be provided, based within communities. To guarantee these populations complete their vaccination courses, this should be integrated with inreach services that already occur at a community level, such as mental health and social care services.

- It is crucial that the cost of a vaccine to a parent is clearly communicated, particularly when they are free at the point of delivery.³⁸

Underpinning factors

The success of routine pediatric immunization policies is underpinned by a series of factors. These factors are critical in implementing effective immunization policies and services. Each factor is at play throughout the approach and influences each aspect of the pathway.

Policy implementation and efficacy

- If a policy is to be effective, governments must implement a strong policy surveillance system. Surveillance systems allow monitoring of the adherence to a vaccination policy, and therefore can help determine whether there are gaps in implementation that need addressing.³⁹ When implemented it must be reiterated to the public that their data will only be available to the health services, to avoid suspicion of data misuse which could negatively impact confidence and willingness to vaccinate.
- Policy implementation strategies must be agile and able to adapt to local context to maximize their effectiveness.⁸ Centralized immunization registers should be used to identify areas with disproportionately low coverage rates, to enable resources to be directed to them to address the barriers.⁴⁰

Funding

- Governments must look beyond the short-term political cycle and prioritize long-term, system-wide investment in immunization, beyond the procurement and purchasing of vaccines.^{41,42} They must recognize the importance of effective resourcing and funding, for example to HCPs to equip them to prioritize proactive engagement with parents as well as public health agencies to support public health campaigns.⁴³
- Governments must also recognize the economic and societal benefit yielded by investing sufficiently in preventative measures, such as routine immunization. Investment in routine pediatric immunization will result in long-term health service cost savings, and a healthier and, therefore, more productive population.⁷⁴
- Global and regional health bodies, such as the World Health Organization and the ECDC, alongside national health bodies, should reinforce the value and importance of national governments investing in immunization.

Vaccine complacency and fatigue

- Governments must look to improve populations' risk perception of vaccine preventable diseases (VPDs) to ensure routine vaccinations are regarded as a necessary precaution.⁴⁴ Messaging should therefore provide simplified information about the role of vaccines in reducing the frequency of outbreaks and the relative risk of vaccines compared to VPDs.⁴⁵
- Governments should develop effective education and communication programs to help counter vaccine misinformation and poor risk perception of VPDs which contribute to people's inertia towards receiving vaccinations.⁴⁶
 - The lack of trust populations have in governments and the media can act as an antecedent to vaccine fatigue. Governments must therefore work to develop a more transparent and symbiotic public relationship with media to reinforce the credibility of vaccination directives.⁴⁶

Vaccine confidence

- Vaccine confidence should be built proactively and continuously, by a range of actors including the government, health systems, public health officials, local leaders (such as religious figures) and HCPs.
 - For communities that may be disproportionately hesitant relative to the wider population, engagement from trusted actors is essential to build trust and improve vaccine confidence, especially for routine vaccines that have a long, well-established, record of safety.^{47,48}
 - Messaging should target populations that demonstrate hesitancy as opposed to anti-vaccination sentiment. Patients with anti-vaccination attitudes are unlikely to respond to interventions, and only make up a fractional proportion of the patient population.⁴⁹
 - Messaging should communicate vaccine safety in a relatable and digestible manner. Approaches must be dynamic and should be tailored to the specific vaccine/ disease, to account for specific concerns and misinformation.⁵⁰ Messages must be underpinned by science and evidence to build trust with patient populations.⁵¹
- Low health literacy rates can contribute to lower levels of vaccine confidence.⁵² Health literacy building initiatives should be implemented to help the public better identify misinformation. Information should be communicated clearly, using relatable examples to demonstrate safety and efficacy.
- Attitudes towards vaccination are often stronger outside of urban centers,⁵³ therefore, there should be an adaptable, sub-national approach to building vaccine confidence.
- With the introduction of new vaccines to National Immunization Programs (NIPs), there is the risk that hesitancy towards this new vaccine may bleed into attitudes towards existing routine immunizations.⁵⁴ To avoid this, proactive messaging to bolster confidence in existing vaccines should be disseminated simultaneously to the inclusion of new vaccines.

Social media

- Social media should be utilized by governments and public health leaders to disseminate information and key messages to the public.⁵⁵ This must be used in tandem with other mediums as not all populations are active on social media platforms.
- Influential figures, such as sports persons, bloggers and celebrities from across different sectors of society should be activated by public health authorities to communicate the importance of vaccination in communities that have a distrust of government and/or health authorities.⁵⁶
- Social media listening should be conducted to monitor the public's attitude towards vaccination.⁸⁰ The findings should be considered on an ongoing basis and used in real-time to adapt public health messaging to address pertinent concerns about immunization.

Assessment checklist

The following assessment will help determine whether your current vaccination system meets the robust approach outlined in this position paper. For a system to operate with minimum friction, and in turn, achieve high rates of immunization coverage, each factor must be implemented effectively. Where a factor is not being met, barriers to coverage will present. These areas can be identified as areas for potential reform, in line with the recommendations set out in the paper. Where it is unclear whether a factor is being implemented or not, it is advised that the corresponding approach or underpinning factor set out in the paper is implemented. Alongside this, a plan should be developed to support implementation through raising awareness of updates to the system, notifying the actors to which the changes pertain. Ensuring that systems meet the following factors will help contribute towards increasing routine pediatric vaccination coverage to meet the 95% target.

Robust Approach for Effective Immunization

Factor	Is the factor being implemented with no room for improvement – Yes/No?	Next steps	Evaluation
<p>There is frequent and mandatory vaccine communication training for all vaccinating healthcare professionals, which meets <u>all</u> of the following criteria:</p> <ul style="list-style-type: none"> • Training emphasizes joint decision-making and patient-led care • Training emphasizes the importance of taking a tailored approach when delivering any vaccine-related information, considering patient understanding of vaccination and health literacy, their relationship with the patients, and any language or cultural barriers • Training emphasizes the importance of open conversations, enabling patients to raise concerns in a respectful environment 	<p>Example:</p> <p><i>No, current communications training for HCPs does not address conversations between HCPs and patients for consultations specifically related to routine vaccinations</i></p>	<p>Example:</p> <p><i>To determine the correct level at which this training should be delivered (e.g. during initial medical, training or as part of continuing medical education), and therefore identify the correct stakeholders to engage to develop appropriate training. A mapping exercise may be undertaken to identify global best practice.</i></p>	<p>Example:</p> <p><i>Following the piloting of communications training for HCPs, feedback has indicated the need for more frequent sessions and the availability of session recordings online to enable greater flexibility. The training course will be adapted to enable greater flexibility ahead of wider roll out.</i></p>

<p>There is a wide availability of accessible vaccination materials that are considerate of low health literacy levels, particularly within areas of:</p> <ul style="list-style-type: none"> • Low uptake rates • Low literacy levels • High migration – In these areas, materials should also be available in multiple languages determined by the local context 			
<p>Vaccination communication campaigns are proactive and frequent and meet the following criteria:</p> <ul style="list-style-type: none"> • Targets localities and populations with high variation in coverage and lower levels of vaccine confidence • Messaging clearly communicates the safety and efficacy of the vaccines within the NIP in a relatable and digestible manner and remains agile to address changes to the NIP and emerging infectious disease outbreaks • Developed in partnership with community, cultural, and religious leaders • Reinforced with the addition of new vaccines to the NIP 			
<p>Social media is utilized to amplify pro-vaccination communication campaigns and target misinformation.</p>			

<p>Frequent social media listening exercises are conducted by independent, impartial organizations to assess public attitudes and confidence in vaccination and identify emerging anti-vaccination messaging to be addressed.</p>			
<p>Education and communication programs are in place, including simplified messages on vaccine safety and their preventative impact, to counter misinformation and poor risk-perception of vaccine-preventable diseases.</p> <p>Vaccination appointments are accessible, meeting <u>all</u> the following criteria:</p> <ul style="list-style-type: none"> • Short waiting times • Close to public transport • Flexible, during non-working hours 			

Underpinning Factors

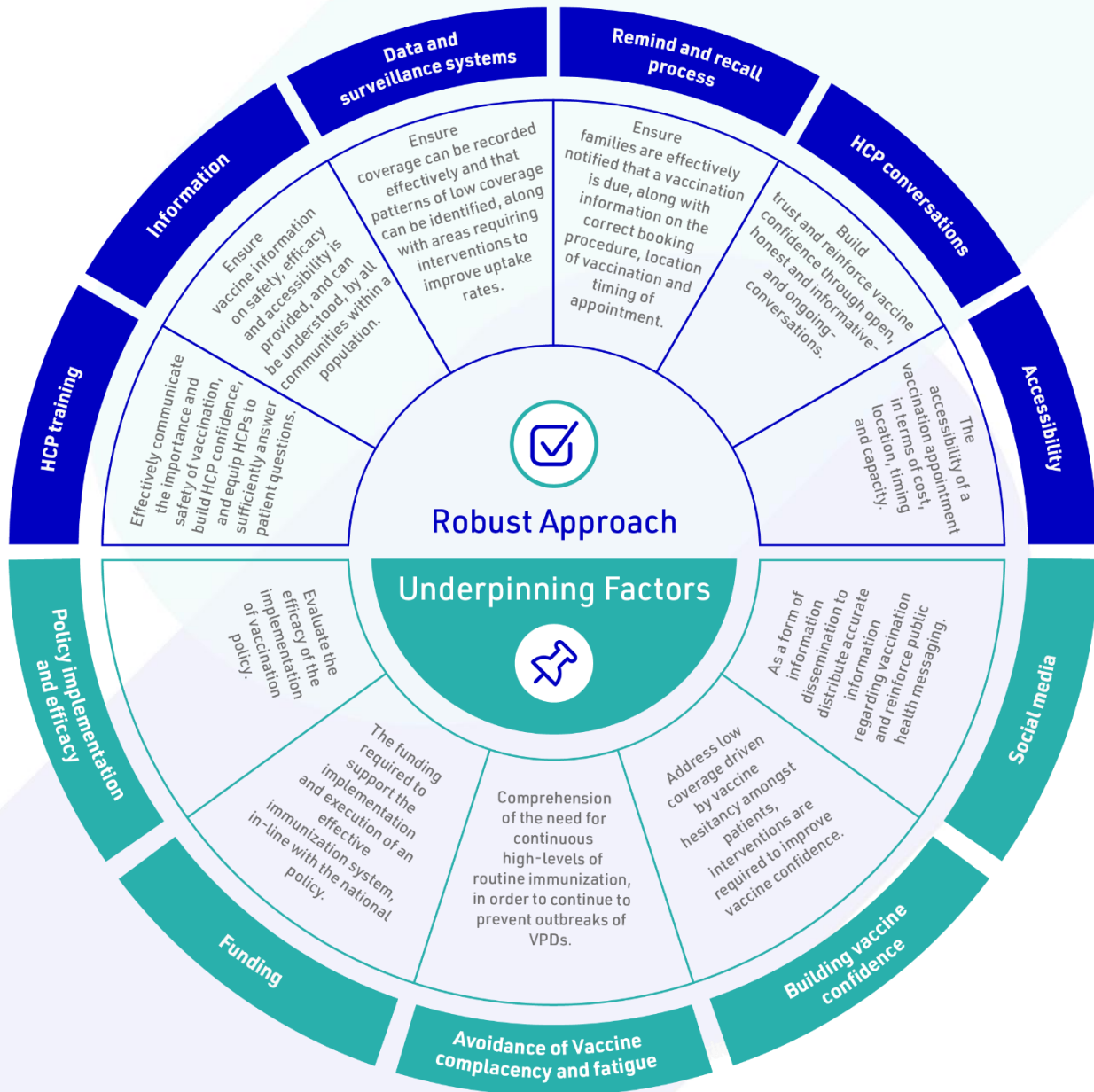
Factor	Is the factor being implemented with no room for improvement – Yes/No?	Next steps	Evaluation
<p>A centralized immunization register enabling the ongoing evaluation of the efficacy of the national policy. The evaluation is used to inform the implementation of targeted programs to support increased uptake in areas where coverage is disproportionately low.</p>	<p>Example:</p> <p><i>No, the current immunization register is not centralized and is only partially digitized</i></p>	<p>Example:</p> <p><i>Exploratory research into best practices for routine immunization registers and the current barriers presented by the existing register will be performed. This will be used to make an initial case for funding to further investigate the appropriate system transformation methods.</i></p>	<p>Example:</p> <p><i>Roll out of the national immunization system has already led to an increase in the number of opportunistic vaccinations administered to children.</i></p>

<p>=Sufficient funding has been allocated to the vaccination system, looking beyond a short-term political cycle, which enables health systems to proactively implement the NIP.</p>			
<p>An agile vaccination system that enables the national vaccination policy to be tailored locally to improve uptake in areas of high variation in vaccination coverage.</p>			
<p>Vaccination communication campaigns are proactive and frequent and meet the following criteria:</p> <ul style="list-style-type: none"> • Targets localities and populations with high variation in coverage and lower levels of vaccine confidence • Messaging clearly communicates the safety and efficacy of the vaccines within the NIP in a relatable and digestible manner and remains agile to address changes to the NIP and emerging infectious disease outbreaks • Developed in partnership with community, cultural, and religious leaders • Reinforced with the addition of new vaccines to the NIP 			
<p>Social media is utilized to amplify pro-vaccination communication campaigns and target misinformation.</p>			

<p>Frequent social media listening exercises are conducted by public health authorities to assess public attitudes and confidence in vaccination and identify emerging anti-vaccination messaging to be addressed.</p>			
<p>Education and communication programs are in place, including simplified messages on vaccine safety and their preventative impact, to counter misinformation and poor risk-perception of vaccine-preventable diseases.</p>			

Framework

The framework is a visualization of the proposed approach to immunization services and policies. The framework details each of the factors that contribute to this approach, providing the relevant stakeholders with a rapid snapshot of the recommendations set out in this position paper.



Annex

Advisory Group Context

The Strengthening the Childhood Immunization Pathway (SCIP) advisory group program, and subsequent position paper, has been organized and funded by Pfizer Inc, a multinational pharmaceutical and biotechnology corporation. The SCIP advisory group comprises eight key opinion leaders (KOLs) from across six different countries: Australia, France, Italy, Romania, Turkey and the United Kingdom. Participating key opinion leaders were carefully selected and invited to participate based on their professional experience as pediatricians and professionals in the fields of behavioral medicine, vaccine confidence and infectious diseases. SCIP members have first-hand knowledge of the dynamics of the pediatric vaccination pathway within their country and have provided insight on how to drive policy change regarding pediatric vaccination policy. The advisory group meetings drew on the experience of the members for insight on the success of different pediatric vaccination policies from across the countries. The group discussed how policies can be utilized to strengthen pediatric vaccination pathways and to address existing levers and barriers in the system to achieve 95% pediatric vaccination coverage. Additionally, SCIP members explored the issue of vaccine complacency amongst policymakers, healthcare professionals and parents and their effect on pediatric vaccine uptake. The paper aims to set out an overview of a robust approach to routine immunization but may need to be mindful of and adapted to national contexts.

Methodology

This position paper has been developed based on insights collated through primary research, through the SCIP advisory group, and supplemented with secondary desk-based research. The primary research has consisted of a series of four advisory group meetings and 1 to 1 discussion with the members of the advisory group. The sessions have considered the levers and barriers at play within three key pillars: People, Policy and Process. The insights collated in this paper have been reflected back to the SCIP advisory group for further refinement to ensure the recommended approach considers vaccination systems holistically and is fit-for-purpose.

The following KOLs were invited to participate based on the aforementioned criteria:

Advisory Group Key Opinion Leaders



Professor Adriana Baban | Romania
Professor of Health Psychology,
Behavioral Medicine & Psychosomatic,
and Qualitative Research Methods at
the Babeş-Bolyai University



Dr Alberto Tozzi | Italy
Head of Multifactorial and
Complex Diseases Research
Area at Bambino Gesù
Children's Hospital



Dr Terry Nolan | Australia
Head of the Vaccine and
Immunization Research Group at
the Melbourne Medical School



Dr Sandra Alexiu | Romania
President at Asociația Medicilor
de Familie București-Ilfov



Dr Alex de Figueiredo | UK
Research Fellow at London School
of Hygiene and Tropical Medicine
and Statistics Lead at the Vaccine
Confidence Project



Dr Yasemin Ozsurekci | Turkey
Associated Professor
Department of Pediatric Infectious
Diseases at Hacettepe University
Faculty of Medicine



Dr Gary Marlowe | UK
Partner at the De
Beauvoir Surgery

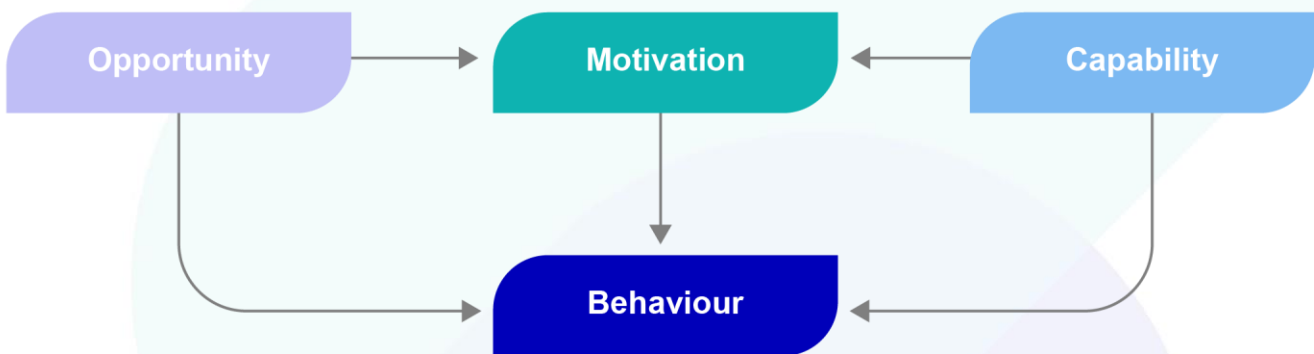


Dr Jean Paul Stahl | France
Medical Doctor at Grenoble
Alpes University Hospital

After conducting the primary research, a round of secondary research took place to substantiate the outcomes of the discussion. These findings were subsequently collated, and then reviewed and validated by the advisory group members.

Modelling

The approach to immunization proposed in this document looks to modify the elements that contribute towards the behavior of the general public (i.e., people receiving vaccinations). The COM-B (Capability–Opportunity–Motivation–Behavior) model, a widely approved behavioral model, indicates that behavior is determined by motivation which is in turn modified by capability and opportunity.⁵⁷



The components of the model are as follows:

- **Capability** – The psychological ability to receive vaccinations; in other words, the knowledge and understanding parents, or actors within the system have, of vaccinations
- **Motivation** – The decision-making processes and automatic process, such as emotions, that dictate attitudes towards vaccinations and willingness to vaccinate
- **Opportunity** – The ability to access vaccinations, in terms of ease of access, cost and convenience.

All of these elements contribute to an individual's behavior.

The approach to immunization set out in this paper based on the insights shared by SCIP advisory group members aim to improve patients' capability and opportunity to be vaccinated – when implemented, populations should have greater motivation to pursue routine immunizations.

Useful resources

The following list of resources includes external tools and case studies that can be drawn upon to help support the implementation of the recommendations proposed in this position paper:

WHO

- [Immunization Agenda 2030](#)
 - [Framework for Action](#)
 - [Scorecard](#)
- [Defeating Meningitis by 2030 : A global road map](#)
- [TIP Tailoring Immunization Programmes](#)
 - [Tailoring Immunisation Programmes Charedi community, north London](#)

European Centre for Disease Prevention and Control (ECDC)

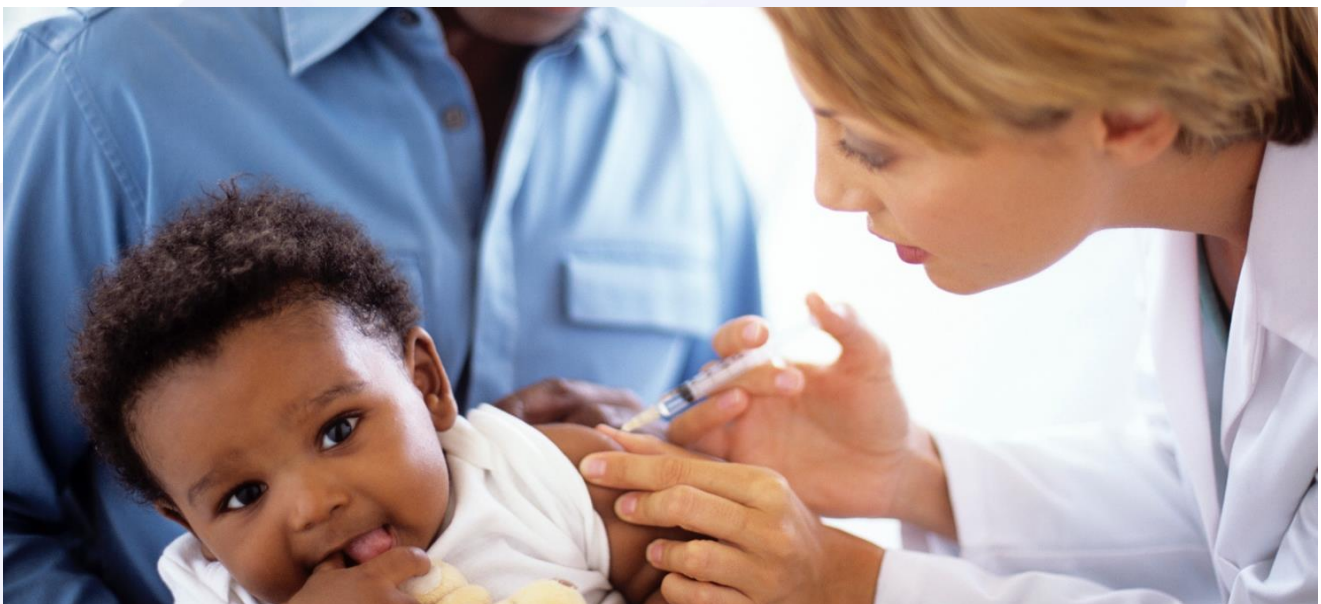
- [Handbook on designing and implementing an immunisation information system](#)
 - [Immunisation registers in Europe and elsewhere](#)
- [Let's talk about protection: enhancing childhood vaccination uptake](#)
- [Catalogue of interventions addressing vaccine hesitancy](#)
- [Translation is not enough: cultural adaptation of health communication materials](#)

Wellcome Trust

- [Effective ways to increase vaccination rates: What the evidence tells us](#)
- [An effective vaccine ecosystem equipped to meet the challenges of future infectious disease threats](#)

Sabin Vaccine Institute

- [Meeting the Challenge of Vaccination Hesitancy](#)
- [Vaccine Acceptance Research Network – Shaping Global Vaccine Acceptance with Localized Knowledge](#)



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