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The immunization Agenda 2030: A vision of global impact, reaching all, grounded in the realities of a changing world

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The launch of the Immunization Agenda 2030 (IA2030) came at an extraordinary and turbulent time in our collective experience. The COVID-19 pandemic erupted into all our lives, stopping dead in their tracks economies, education systems, human connections and many lives – lives of persons we loved. It has brought vaccines and immunizations back into the spotlight. In a single year we witnessed the emergence of a novel pathogen, the collective sprint to design, develop, evaluate, and manufacture numerous successful vaccines and deliver hundreds of millions of doses worldwide. This is a testament not only to the power, ingenuity and shared responsibility of collaborative science, but of our shared humanity. The acute phase of the pandemic will be controlled and a return to some sort of new normal will be achieved. COVID-19 vaccines are expected to make a major contribution toward that goal, and this remarkable achievement of vaccine science will need to be accompanied by continued political commitment, global economic partnership, and public engagement. At time of writing, the longer-term trajectory of SARS CoV-2 and the vaccine strategies to constrain its full impact are still unfolding, yet it is clear that the global vaccine ecosystem, which touches every community of every country around the world is being put to the test.

Vaccine programs in the late 20th century and early 21st have contributed to the receding of infections previously ravaging human populations. Yet stubborn stagnation of vaccine coverage during the last decade, and severe backsliding during the pandemic years, has meant their full value is yet to be realized. Polio is stubbornly clinging to the last corners of the world, resurgent measles epidemics in countries of all means have taken hundreds of thousands of lives, and life-threatening diseases like diphtheria, meningitis, pneumonia, and diarrhea remain a reality for too many. This is a stark reminder that we cannot be lulled into a false sense of complacency about the need for vaccination and that achieving high coverage, with equity is anything but routine. We have to leverage this momentum to not only use vaccines as a critical tool to address the pandemic but to ensure equitable coverage of all available vaccines to prevent outbreaks and address health threats for individuals, in every community. The impact of vaccines to reduce morbidity and mortality in a highly cost-effective way is well quantified and well known. Their true impact can only be realized if they are accessible to everyone, particularly those who need them most.

The IA2030 therefore, is a vision for our present and future world in which vaccines are available and accessible and provide protection from disease, fostering health and making possible life’s opportunities to all, no matter the vagaries of birth, geography or economy. It is a vision co-created through iterative input from and representation of wide segments of the global community, stakeholders and end beneficiaries. A world where everyone, everywhere, at every age, fully benefits from vaccines for good health and wellbeing. This vision articulates a goal of reduced mortality and morbidity from vaccine-preventable diseases for everyone – infants, children, adolescents, adults and the elderly. A world in which no one is left behind, and access and use of new and existing vaccines is equitable. Where immunization systems build up, build out, and nest firmly within comprehensive primary health care and contribute to universal health coverage and sustainable development.

These goals are grounded in real world strategic priorities and our experience in operating immunization programmes over many decades; it is these that are laid out and explicated in this Supplement. All seven IA2030 strategic priorities are essential building blocks to deliver the COVID-19 vaccines.

The first of the IA2030 strategic priorities is that immunization programmes strengthen Primary Health Care and support Universal Health Coverage, which have been a focus of global public health ever since the Declaration of Alma Ata in 1978. The moment for unwavering political commitment towards this goal has never been stronger. This is achieved by reinforcing and sustaining strong leadership, management and coordination of high quality immunization programmes at all levels, and crucially by planning for and ensuring the availability of an adequate, effective, sustainable health workforce. It further requires comprehensive surveillance for vaccine-preventable disease including reliable, quality-assured laboratory networks with the right equipment, supplies, and expertise in place around the world. It requires robust supply chains for vaccines and related commodities and effective vaccine management, within the primary health care sup-

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ply system. All aspects of immunization programmes must be underpinned by health information systems that provide high-quality data tailored for action for end-users, at all levels. A fundamental role of integration of primary health care, surveillance, data systems, planning and monitoring is the establishment and maintenance of vaccine safety surveillance, involving all stakeholders, and critical for trust in the health system, immunization programme and vaccine acceptance.

The second strategic priority relates to political commitment & community demand for vaccination. Sustaining strong political and financial commitment for immunization is conceived broadly, with engagement at national and subnational levels of governance and close engagement with community groups, partners, stakeholders, vaccine advocates and vaccine recipients and their families. It is reflected in policy planning and in fiscal instruments. Decision making is to be better informed by evidence, with technical support from local expertise, such as national immunization technical advisory groups. Decision makers, stakeholders and all elements of the vaccine delivery chain need to be accountable for their part in the immunization programme, and data transparently reported to communities and civil society for joint monitoring. Additionally, through this strong community involvement and engagement, it will be important to understand social drivers of vaccine uptake and confidence, including social processes, gender-related barriers, practical factors and countering mis- or disinformation. Engagement, social listening, accountability and data transparency together support improving public trust and confidence as well as improving the quality of services, including convenience for the beneficiaries. Transparent and regular two-way communication of evidence will be important to counter disinformation, while still allowing open discourse, expression of public concern, and opportunities to address them by providing reassurances based on science and evidence. All these principles are being put thoroughly to the test as the global community and national governments work to deliver a constrained supply of COVID-19 vaccines to precipitously high but precarious demand, by listening to and addressing genuine community concerns through transparent vaccine safety systems and real-time data. By identifying and tackling barriers to procurement and fair allocation. As a global community we must succeed in using vaccines safely, effectively and equitably to deal with the current global crisis. And once we do, then vaccination programs should be leveraged to maintain political commitment of sufficient and sustainable resources, and maintaining high community confidence, demand and engagement.

The third strategic priority is to achieve equitable vaccine coverage. This requires ensuring immunization services reach under-vaccinated or un-vaccinated children, the so-called ‘zero-dose’ children, and their communities. Data suggest that zero-dose children are largely clustered in remote rural, urban slum or conflict-affected communities. These communities, which often face multiple deprivations will require context specific, tailored delivery strategies, requiring political engagement, specific investments, and a recognition that counting the previously uncounted may initially adversely affect coverage estimates. COVID-19 disruptions have widened immunization inequities. These disruptions need to be urgently addressed even while the programmes deliver COVID-19 vaccines at an unprecedented scale and speed. Much of our evidence and knowledge in immunization equity can be leveraged to ensure equitable distribution of COVID-19 vaccines – including for underserved populations like migrants, refugees and internally displaced populations in fragile conflict-affected communities. The IA2030 prioritizes setting goals that are aspirational, but grounded in honest realities, rather than targets that are inspiring but simply cannot be met. High coverage should be achieved across all districts and populations, on the basis of values of justice, but also as a public good. Effort is therefore needed to identify and address barriers to coverage throughout the life-course especially among the most disadvantaged individuals and communities. Focusing on age, gender, location, social or cultural factors, allows development of evidence-based approaches to overcome barriers and achieving high, equitable coverage. The experience of disease eradication and elimination initiatives in reaching the most marginalized populations, and integrating immunization with disease control perspectives and with universal primary healthcare provisions will be important for reaching the under-vaccinated consistently and sustainably. Locally derived knowledge and ingenuity should be encouraged in order to develop context-specific, people-centered approaches to redress inequitable coverage. Central to any success of IA2030 are gender considerations which impact on programme leadership, design, community engagement, and most importantly household decision making on accessing vaccination services for the benefit of children, adolescents, pregnant women, and their families.

The fourth strategic priority is to consider the role of vaccination throughout the life-course and integrated in health service delivery for people. This includes considering not only adherence to scheduled timepoints for infant vaccination but making easily available catch-up vaccinations and booster doses and identifying and addressing missed opportunities to vaccinate under-immunized individuals. It implies the establishment of integrated delivery points of contact between immunization and other public health interventions for different target age groups. For example, by providing adult vaccination through adult health services or following acute care interactions. These activities further require integrated data systems like vaccine registers that can be self-accessed or in some settings provider-accessed. It requires evidence on disease burden among older age groups and on the potential of vaccines to decrease that burden, directly and indirectly. It requires raising awareness of the benefits of vaccination beyond early childhood, through adolescence and in priority adult groups such as pregnant women, health workers and older adults, and requires implementation evidence on delivery strategies that work. It requires links beyond the communicable disease directorates of ministries with the directorates of non-communicable disease for example. The Covid 19 vaccines delivery to health care workers provides a long needed focus on other vaccines such as hepatitis B, oral cholera, influenza and eventually preventive Ebola vaccination. COVID-19 vaccination for older populations and medical risk groups is an opportunity to leap forward in building immunization programs for adults. Cross-sectoral collaboration with public and private health services, and indeed beyond the health care sector to ensure integration of immunization into programmes such as for education, nutrition, water and sanitation, care of older people and women’s empowerment, emphasizing the reciprocal benefit to general health achieved through vaccination. Links to prevention of disease through a ‘one Health’ approach motivates a deeper engagement with the veterinary community and focus on zoonotic diseases. Achieving these broad areas of integration may require programmatic restructure or even legislative action. It will require monitoring vaccination coverage at different ages.

The fifth strategic priority addresses how vaccines and immunizations deal with outbreaks and public health emergencies. Immunization systems must be prepared to detect and rapidly respond to outbreaks of vaccine preventable disease. The response is at least two-fold: rapidly deploying available vaccines to shut down the outbreak, while using the outbreak as an opportunity to address critical gaps in programme performance which had led to the outbreak in the first place. This after-action response is critical for ensuring global health security and resilient routine immunization services are in place in the wake of an outbreak in...
order to break the chain of repeated outbreaks and responses. Outbreaks of a vaccine preventable disease will trigger opportunities to address gaps in immunization programmes for all vaccine preventable diseases. The importance of delivering vaccines in a timely manner in acute and protracted humanitarian emergencies, which are projected to grow in number and size over the decade is paramount to the right of all people to be protected from vaccine preventable diseases. The outbreak response to new pathogens with new vaccines, as has been the focus of the immunization community during 2020, will continue to be a priority. During the Covid-19 pandemic all immunization capacities have been stretched to the limit, highlighting that while we fight the pandemic, immunization programmes, which are essential health services, are eroded. In the most contemporary sense, we need to assess the risk of measles and other outbreak prone vaccine preventable diseases and close immunity gaps. This will require cross-sectoral coordination, investment in local capacity to sustained integrated surveillance and provide comprehensive response that can report to universal standards but that are locally and contextually applicable. Two-way communication and community engagement will be critical to promote participation in decision making and identify gaps in service availability. This strategic priority was conceptualized and authored before the full impact of the COVID-19 pandemic and response was felt. Much has been learned in the past year in terms of successes and costs of the pandemic response, and with respect to resilience and weak points in routine immunization systems. The lessons learned in difficult times are crucial for self-awareness and for building strong systems that can not only withstand future shocks, but can absorb them and mitigate their profound societal impact.

The sixth strategic priority is ensuring sustainable vaccine markets and supply chains. This requires ensuring sufficient financial resources for immunization programmes in all countries and building and maintaining healthy global markets. The COVID-19 experience has shown that market forces alone are insufficient to address the needs of the world and that without coordination, convening, and structures to align competing interests, equitable market access is not achieved. Increasing independence from aid mechanisms for many countries by increasing domestic immunization expenditure and resource allocation to achieve and sustain high coverage for all vaccines is a desired but challenging goal. It will require supply innovation balanced with affordability, so that vaccine access and supply is timely. Forecasting and planning for procurement so that nations’ needs are met and that manufacturers are aware and plan for the expected demand, including through diversification of quality-assured suppliers and strong local regulatory oversight. Good governance, stewardship and accountability of financing will be critical. Rapid access during public health emergencies requires special mechanisms, as have been established in the pandemic of 2020, including the COVAX Facility, other regional procurement mechanisms, manufacturer partnerships, public-partner investments, and agreements on transparency of information have all been components of the current response.

The seventh and final strategic priority is research innovation in vaccine technologies, in vaccine delivery and in supply chain and logistics. The work in this strategic priority will leverage the massive set of lessons from COVID-19 vaccine development, scaleup, and deployment especially on partnership, open sharing of new evidence, adaptive research methods, research collaboration and technology transfer. Developing improved vaccines for endemic diseases like influenza, TB, and malaria, as well as new vaccines for diseases as yet not vaccine preventable, like HIV will continue into this decade. Vaccines for previously unknown emerging pathogens like SARS-COV-2 and preparedness for a future ‘Disease X’ are central parts to this strategy. It also requires improving on existing vaccines, especially for populations in which achieving immunity is biologically challenging like newborns or the elderly. It requires sustained investment in promising ideas that have scalable capacity. Innovations in delivery should be mindful of prioritizing community needs, particularly for underserved populations. Real-world, evidence-based innovations in operational research can shorten the path to maximal and equitable vaccine impact.

The IA2030 vision and priorities are founded on four core principles. (1) That strategy should be people centered, shaped by and responsive to lived realities, including the diversity of experience. It should prioritize achievable real-world impact over idealized goals. (2) It should be country owned, with progress driven and built from the ground up. Targets and milestones should be ambitious, yet with a feasible pathway to being a reality. Progress to these milestones should be transparent and linked to accountability. (3) Systems should be based on strong and diverse partnerships, coordinating multi-sectoral efforts to maximize impact. (4) Decision making should be guided by data and based on high-quality, “fit-for-purpose” evidence. Ongoing monitoring allows for coordinated course corrections in real time. Data must be available and used to drive programmatic changes, while reporting on progress toward targets must be honest and transparent, with health systems held accountable for such progress.
IA2030 will better prepare us for the next pandemic. But more than this, IA2030 reflects a fundamental faith in our ability to work together, mutually, respectfully and collaboratively, building upon one another's expertise and perspectives. Together we really can build a world where all benefit from the advancements and miracle of modern vaccinology.

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**Declaration of Competing Interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.