

Concept Note
Implementation in the Context of Health Systems Strengthening (HSS)
and Universal Health Coverage (UHC)
Session 6
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Implementation in the Context of Health Systems Strengthening and Universal Health Coverage

Introduction

This concept note will further elaborate some of the critical issues related to implementation of immunization services within the broader context of health systems strengthening (HSS) and universal health coverage (UHC) that will be presented during the session 6, Implementation in the Context of HSS and UHC during the SAGE meeting, 12-14 April 2016.

This session has been requested because over the past few years the world has seen a decline and/or stagnation in the immunization coverage. The approaches, structures and method of delivery of services used to actually deliver these life-saving innovations are largely those that were developed in the 1970's and are not optimized for modern and contemporary vaccine programs and health system. The result is that the field lacks a mature depth of scientific evidence, rigorous data, set of methods to inform the optimization of vaccine implementation within the complex health system. A central characteristic of this science is the systems nature of the problems we seek to solve. While there is reasonable know how on what the various core components of an immunization system are and how they should function in a silo, there is a substantial missing understanding on how the interaction of all the components can be effectively integrated to make the holistic system work well as a whole. At present there is a focus on single component solutions separately, rather than the more challenging thinking required for systems approaches.

This session will therefore, inform the SAGE and discuss how to sustain the provision of immunization services as part of integrated health services delivery to achieve universal health coverage. The session will provide an overview of the health systems, including the complexity of implementation and options for achieving greater equity and quality in health care. It will build from experiences related to implementation of select critical components of the health systems, such as supply chains, planning and micro-planning and financial efficiency and gains. Based on experience from ebola, it will highlight the importance of resilience and application of lessons learnt. SAGE will be asked to provide feedback, including on operations research agenda including on a systems based approach for improving immunization coverage and closing equity gaps.

The adoption of the Millennium Declaration in 2000 by all member states of the UN was a defining moment for the international community. The Declaration, the culmination of a series of international conferences and summits beginning in 1990 with the World Summit for Children, embodied a synthesis of the goals set by these international development conferences and a body of international norms and laws that had been codified over the previous half-century. The original 18 Millennium Development Goals (MDG) targets were lifted verbatim from the Millennium Declaration and therefore represented the consensus of member states over a wide range of development areas.

As reflected in the MDGs, the Declaration also represented a new approach to development, with a full recognition that development is not exclusively economic, but also embraces human social and environmental dimensions. The MDGs also reflect a shift in emphasis from inputs to results. It also set specific measurable and time-bound targets for each Goal, with progress to be measured on the basis of a list of internationally-agreed indicators.

More than 15 years later, the Millennium Declaration and the MDG framework for accountability that derived from it have inspired development efforts and helped set priorities and focus interventions. In the intervening years, global initiatives and partnerships have tracked the encouraging progress made towards reducing mortality among children under-five in many countries [2].

However, this progress and the policy adjustments made to redirect trajectories towards meeting the MDG 4 on child mortality have largely occurred at national levels. Lamentably, many of the countries that have made good progress in reducing their under-five mortality rates at a national level have also experienced worsening inequities between their wealthy and poor sub-populations, as well as widening disparities across other socio-cultural group attributes such as ethnicity, geography, food security, and citizenship [3, 4].

As we move into the era of the sustainable development goals (SDGs), foundational to reducing inequities will be ensuring more effective and efficient service delivery strategies. As highlighted above under the MDGs, it is evident that to ensure an increase in immunization coverage and to maintain its sustainability, a broader approach of overall health services through an “integrated and patient centered service delivery” should be considered, particularly now as we move forward towards SDGs to achieve UHC.

We hope this paper stimulates debate on how to operationalize sustainable universal coverage for immunization as a component of strengthening integrated service delivery and serve as a call for increased collaboration to guide evidence-based strategies at sub-national levels.

Delivery Science

There is a growing community of vaccine delivery science, and a body of scientific literature around how to improve core components of the immunization system. A central characteristic of this implementation science is the systems nature of the problems which needs to be further understood to seek effective and efficient solution that would benefit the health system, provides and population. While we know what the various core components of an immunization system are and how they should function in a silo, we don't really understand how the interaction of all the components can be effectively integrated within the larger service delivery area within the health system and how to make it work well in its entirety. To operate in an efficient manner within a health system it requires health professionals views systems and their sub-components as intimately interrelated and connected to each other, believing that mastering our understanding of how things work lies in interpreting interrelationships and interactions within and between systems a "system thinking approach".

The delivery science includes research and training to understand and improve service delivery. Health-related implementation research uses the science to study practices in routine clinical care and public health systems in order to improve the quality and equity of health care. It also includes the study of factors that influence health care professionals and organizations and the factors influencing users of health care services, thus covering demand and supply. Implementation research often involves impact research, which includes research aimed at understanding what happens during the process of implementing a change in policy, programme, or practice, that are designed to compare different approaches to implementing a change.

Knowledge about the delivery of health care to the poor is highly fragmented and focused around narrow topics reflecting funding streams. The design of programmes in the field is often ad hoc and fewer mechanisms in place to capture what practitioners learn in the field on the impact of models of delivery and effective care delivery in low resource settings. This is evident in various countries, particularly fragile states, that goes through acute or chronic crises/complex emergencies, such as South Sudan, Lybia, Syria and Afghanistan to name the few as well as the recent Ebola epidemic that affected three countries with already weak health system.

For vaccine and immunization, the Global Vaccine Action Plan (GVAP) highlights the importance of improving delivery of immunization services to achieve its goals. More specifically, the GVAP request members states, WHO and all others stakeholders to improve the logistics and the delivery of services to the difficult to reach population. This implies WHO and others to have better knowledge about the issues related to unvaccinated and under-vaccinated children, the application of delivery science is therefore crucial elements. WHO has encouraged the operational research on delivery of vaccination, the logistic of vaccination and the demand and reluctance from individuals, families and communities. Despite the recognition, these

interventions are also often still delivered in isolation and not as a component of integrated service delivery.

Delivery science will be as well an opportunity to develop multidisciplinary approach, encompassing both quantitative and qualitative approaches that require expertise in epidemiology, statistics, anthropology, sociology, health economics, political science, policy analysis, ethics, and other disciplines. Annex One contains a recent WHO background paper on Delivery Science.

Sustainable Development Goals and Universal Health Coverage (UHC)

The sustainable development “2030 Agenda” was adopted on 25 September 2015, and is composed of 17 Sustainable Development Goals (SDGs) and 169 targets to succeed the Millennium Development Goals (MDGs). The new SDGs link economic, environmental and social determinants of sustainable development with a clear focus on equity, often summarised as “leaving no-one behind”. The SDGs are for the needs of poor, disadvantaged and vulnerable populations in any country.

Under Sustainable Development Goal 3, which is to “Ensure healthy lives and promote well-being for all at all ages”, rest the targets relevant to UHC:

- By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.
- By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.
- Achieve Universal Health Coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

Frequently, UHC is defined as the situation where "all people have equitable access to health services and do not suffer financial hardship paying for them [5]." UHC is increasingly advocated as an important objective of health policy at global, regional, national and sub-national levels. The SDGs extend the dialogue on the achieving the Universal Right to Health [6] to every community and household, with explicit and formal pledges to engage individuals, communities and civil society in developing, implementing and overseeing health policies.

In more detail, UHC seeks to ensure that:

- All people obtain the health services they need (including prevention, promotion, treatment, rehabilitation, and palliation), of sufficient quality to be effective;
- The use of these services does not expose the user to financial hardship

Health Systems Strengthening and UHC

Strengthening, reorganizing and revising:

1. *The mix of interventions* to meet changing needs based on epidemiological and demographic trends: preventative, promotive, curative
2. *The mix of service delivery platforms* used to reach various populations with all needed services: e.g. Facility based, outreach, campaigns; but also by strategies to remove access barriers, both financial and social ones.

To advance on HSS, there is also the need to overcome the persistent misalignment between the process of developing the annual operational plan of the health sector, and the process of allocating an annual budget to the sector. Delivery science can help by identifying more effective and efficient service delivery practices, which can be more convincingly presented as high “value for money” investments that can attract and sustain domestic and external financing.

Pro-equity HSS for UHC

Persisting health inequities are not only wrong in principle but also in practice as they continue to retard progress towards achieving health goals. Understanding the pathways by which the poor and most vulnerable continue to be left out is essential if we are to move equitably and in a rights-based approach towards universal health coverage (UHC).

Pro-equity programming for health takes place within on-going global discussions around the post-2015 agenda for health, which has coalesced in recent years around “Universal Health Coverage” (UHC) as the post-2015 Sustainable Development Goal for Health.[7-9] However, clarity is lacking on what UHC means in practice [10] or how it can be best unpacked to catalyse tangible and sustainable changes to use of services by those currently left behind [11]. In practice, the feasibility of UHC is not merely a technical question but also a social and political one. Engaging civil society and fostering an enabling political environment, focused on achieving equity in health access and coverage, are therefore essential for sustaining UHC. An equity-focused approach to programming places the needs of the most deprived into account *first*, ensuring their needs are given sufficient and immediate attention to narrow the equity gaps.

Pro-equity programming must be based on knowledge of the magnitude, patterns, trends, as well as causes in inequities in child development, with specific strategic shifts tailored to address local processes of deprivation from basic services [12,13]. As yet, there is no single low-cost and robust approach available for sub-national managers to simultaneously assess financial and non-financial barriers to the uptake of RMNCH services. WHO is working with other partners to develop such sub-national assessments, which will be essential for prioritising barriers and developing solutions that quickly improve the equity as well as accelerate increases in immunization coverage[14-16].

Equity analysis: looking beyond averages

The equity situation analysis should highlight how far away the country is from reaching universal coverage of quality basic services. It should help document the unequal distribution and utilisation of services as well as make the link to the costs, quality and relevance of services on offer. The analysis should provide answers to the following questions:

- Which groups are deprived or at risk of deprivation from quality basic services?
The location and size of each deprived sub-population should be quantified and their shortfall in coverage of access and utilisation of basic services and child outcomes should be compared to the national target, to the national average, and to the best performing group. This should include a description of the magnitude and pattern of inequity in the country along with their underlying causes.
- Which services/interventions/opportunities are not reaching these groups?
Identification of inequities related to service delivery and service utilization.
- What are major structural economic, financing, socio-cultural, policy and institutional barriers to the delivery and utilization of quality basic services?

An equity-based approach “seeks to understand and address the root causes of inequity so that all children, particularly those who suffer the worst deprivations in society, have access to education, health care, sanitation, clean water, protection, and other services necessary for their survival, growth, and development”[17]. The graph below shows how immunization rates vary across different sub-populations in Vietnam, with ethnicity a significant factor in predicting immunization coverage. To the far left, the national DTP3 coverage of Vietnam is placed alongside of those from Ghana, Rwanda and Bangladesh. While the urban rich enjoy coverage closer to Ghana, poor Hmong girls have virtually no uptake of immunizations.

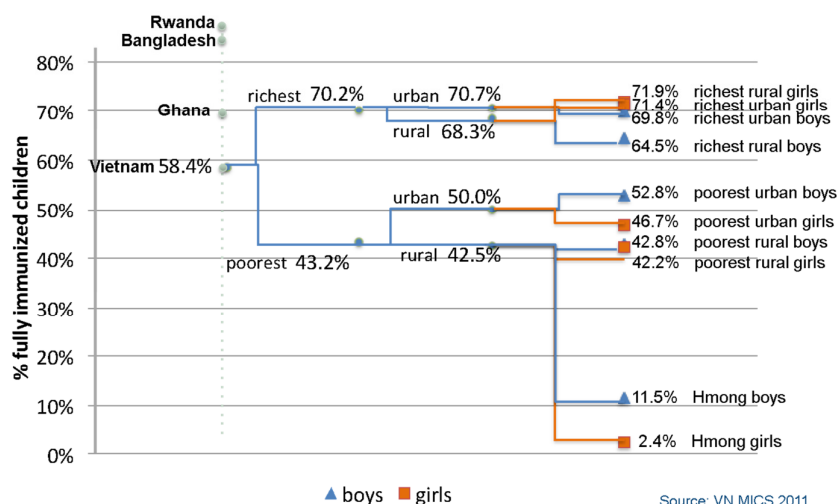


Figure 1: Immunization marginalization – Inequities within countries (Vietnam)
Thiede and Koltermann [16]

While immunization, or even health managers and policy makers, may have limited ability to shape many Social Determinants of Health directly, information on social and contextual factors constraining uptake of immunization service can lead to practical and effective responses. It is clear that higher levels of maternal education, for example, correlate strongly with higher immunization rates and improved child survival[16, 18]. The figure below shows that in Rwanda, mother's education is more strongly predictive of immunization coverage than wealth asset quintile.

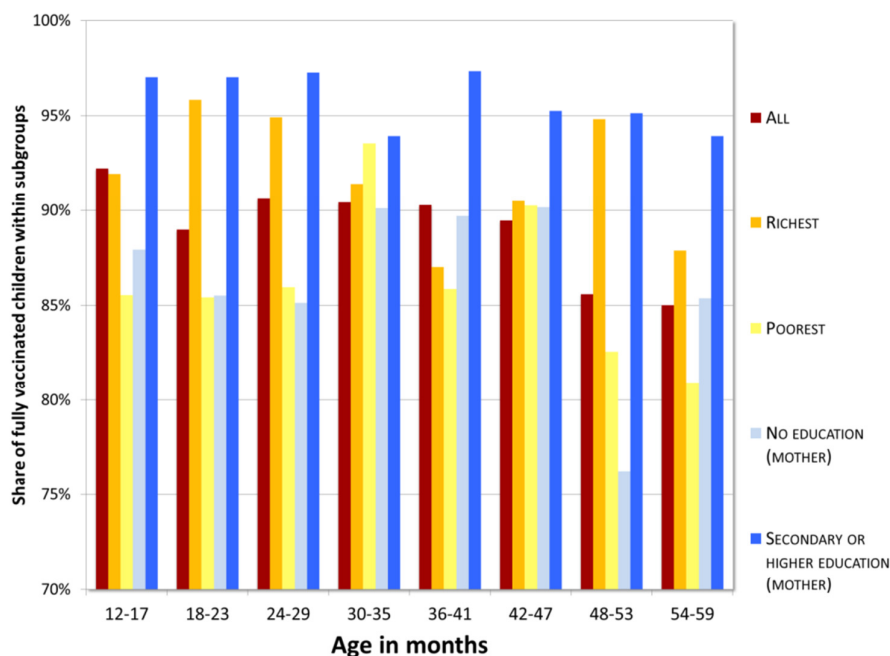


Figure 2: Full immunization by 6-month age bands, Rwanda Thiede and Koltermann [16]

A health-systems response could be taken to use information on low maternal education rates in a district to shape C4D strategies that provide targeted messages to build awareness and acceptance, among mothers with little formal schooling, of the value of immunizations [19, 20].

Pro-equity programming for immunization services

Research increasingly shows that inequities in supplying universal access to quality PHC and other essential social services have a direct and negative impact on immunization coverage, and on the equity of that coverage: “Stagnating rates of vaccination coverage may be related to increasing inequities”[19, 21]. Studies calling for urgent expansion of routine immunizations to under -and un-served communities, while acknowledging the strengths of the Reaching Every District (RED) approach [22], similarly note that Routine Immunization strengthening is only sustainable if integrated with other services [23-26]. Leveraging scarce resources to reach the last child requires new approaches robust enough to bring the full packages of services parents wish their children to use, in place of the all too common piecemeal

approach where the poor are given the crumbs off the PHC table. In Ethiopia, the evaluation of RED praises the accomplishments achieved under the integrated PHC approach used by Health Extension Workers, with immunization a core component of community-oriented services and advocacy, while in Ghana it was noted application of RED benefited integrated services including immunization [27].

Linking Immunization Coverage to Health System Strengthening

WHO, as a founding member of the GAVI Alliance, supports the work culminating in the GAVI Alliance Board declaring “the Alliance must accelerate progress on improving vaccine coverage and equity, and improve the HSS mechanism to address immunization constraints.” A paper by Duclos *et.al.* notes the central role HSS plays in protecting the immunization investments and gains:

First, is the need to develop integrated strategies, whereby immunization is implemented as one of the elements of a comprehensive approach to disease control, be it meningitis, acute respiratory tract infections, pneumonia control, diarrhoeal diseases control, cancer control, antenatal care or epidemic/pandemic prevention and control. Hence, it becomes a component of integrated service delivery, which is feasible through a non traditional and system thinking approach (40). Second, the delivery of routine immunization must be seen by all as the basis and the foundation of immunization programmes and must be given attention and dedicated resources [28].

Reaching Every District to Reaching Every Community

In 2002, WHO and UNICEF, in collaboration with country governments, developed a “Reaching Every district” (RED) strategy in order to scale up immunisation coverage. The five components of the RED Strategy include supportive supervision: on-site training; community links with service delivery; monitoring and use of data for action; better planning and management of human and financial resources [22]. The advent of UHC has built upon pro-equity aspects of the Global Vaccine Action Plan (GVAP) and the Decade of Vaccines, making equity in immunisation coverage an increasing concern of global, regional and national health policy makers and planners.

Numerous studies repeat the findings in Rwanda that “the immunisation programme is not just about vaccination, it also acts as a gateway to other health services”[29]. The experience of Mongolia with the Reaching Every District (RED) strategy showed that immunization was a springboard for improving access by the poor to other PHC services, since RED was expanded to include other MCH interventions beyond vaccinations [30, 31]. This gives immunization services the potential to be a path setter for an equity approach to strengthening access to PHC services [32]. Recent work shows it would be possible to avert deaths of “147 million children, 32 million stillbirths, and 5 million women by 2035” through a comprehensive approach that targeted PHC interventions including immunization, but which also critically invested in increased family planning and ensuring adequate numbers of appropriately trained, motivated and retained staff [33].

Several practical options are being pursued across Low and Middle Income Countries (LMICs). One example is linking introduction of vaccines for pneumonia and diarrhoea to expansion of integrated Community Case Management (iCCM) to effectively treat childhood pneumonia and diarrhoea in populations currently not accessing PHC services. Equally, an integrated strategy also calls attention to the critical role of measles and pertussis vaccines in reducing pneumonia-related illness and death in children, emphasizing the role of routine immunization services to protect broader investments in child health. This is at the strategic thrust of The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD).

The GAPPD advocates integrated activities that optimize synergies across various system strengthening efforts and ensures efficient use of primary health resources to greatly reduce under-five mortality through well-coordinated efforts to control pneumonia and diarrhea in children less than five years of age. The GAPPD notes the need to:

- *protect* children by establishing and promoting good health practices;
- *prevent* children from becoming ill from pneumonia and diarrhea by ensuring universal coverage of immunization, HIV prevention and healthy environments;
- *treat* children who are ill from pneumonia and diarrhea with appropriate treatment [1]

Addressing demand-side barriers as a means to promoting equity

Inequities in immunization are often tied to demand-side barriers that mediate the effectiveness and impact of delivery strategies. Therefore, Delivery Science research should also identify interventions that address these barriers – such as social protection and communication for development – are key to equity-based approaches.

An example is promotion of integrated social protection systems that take a multi-sector approach to address the numerous vulnerabilities faced by children and their families [34]. This also recognizes the importance of investing in demand-side interventions alongside improved service provision, and of coordinating demand and supply-side mechanisms [35]. Of course, these do not function in isolation from other cross cutting and multi-sectoral approaches that address broader Social Determinants of Health (SDH) issues, and which link Ministries of Finance, Labor, Planning, Social Policy, and Foreign Affairs, all of which are vital for resolving the contextual factors that generate inequities. While these are largely outside the scope of this paper, there are a few critical aspects of social protection that directly impact on equity in the use of immunization service.

One example of a cross-cutting initiative of recognised importance to achievement of immunization goals is improving vital registration systems [36]. Numerous studies show that children who are not birth registered are less likely to receive PHC,

Nutrition, Education, and other essential social services, and thus suffer worse health and social outcomes over their lifespan. Inequities in access and use of social services for the child leads to inequitable outcomes for the adult [37, 38].

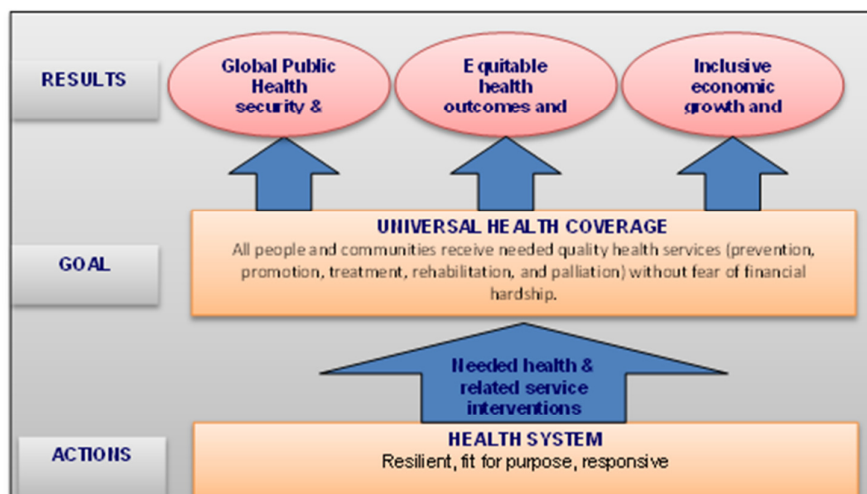
Examples relevant to joint programming efforts include attempts to strengthen birth registration (BR) and link BR to distribution of immunization cards during perinatal and neonatal care contacts. The multi-country evaluation of immunization's Reach Every District (RED) noted one common weakness was the lack of maternal and neonatal registration, recommending that: "More active use of community volunteers to identify these women and children would facilitate the ability of health facilities to locate and serve their clients "[27]. Recent innovations, including use of Rapid SMS to alert local authorities of a new birth and trigger birth registration and distribution of immunization cards is being explored in several contexts [29, 39].

How might increasing resilience link to equitable coverage for immunizations? One approach is using the opportunity of new vaccine introduction for either pneumonia or rotavirus as an advocacy platform for increased attention to increasing community resilience. This could be achieved by addressing demand side enablers of resilience such as promotion of hand-washing, and supply-side enablers such as support for actions to increase access to safe water and sanitation.

Conclusion

Health system strengthening efforts should be viewed as an integral part of the mechanism for delivery of required immunization services, not as a complementary element to this. The objectives and focus of health system strengthening efforts are built on putting in place the necessary platform to assure the delivery of required program interventions in an efficient, equitable and effective manner. The health system strengthening efforts are therefore not an end in themselves, but rather a means to an end. Health System strengthening remains an integral part of the efforts towards UHC and attainment of the SDGs.

Health Systems, UHC and the SDGs



While the immunization program is specifically interested in a selected set of elements of the health system, the functionality of the whole system is needed, for the program to assure the elements they are interested in are available and functional. Therefore, as a program, we should be interested in ensuring full system functionality. This is through three mechanisms: (1) making direct investments; (2) working with similar programs to make combined investments, or (3) becoming an advocate for making of required investments. The approach the immunization program takes is country dependent, and should be driven by evidence in terms of impact on the overall immunization goals, and feasibility. A system diagnosis would assist the country to understand the gaps in the system and their potential impact on immunization outcomes. A health workforce (HW) gap may be addressed by direct recruitment of HWs in one country, or by advocating with Finance for more HW recruitments in another.

Having a resilient, fit for purpose and responsive health system should be the goal that immunization programs support across all countries, as this is what will assure delivery of immunization program outcomes in a sustainable manner. Selective investments, with little understanding of the state of the system and the environment within which it is operating will not give the kinds of goals the program is seeking. The immunization program delivery model needs to take cognizance of this, for it to attain Universal Coverage with required antigens. Attainment of its goals requires a concerted effort that looks into what kinds of access, quality and service demand targets the health system needs to achieve, and then strategize on how to facilitate attainment of these targets through assuring presence of needed investments in the different elements of the health system.

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ANNEX 1: A REVIEW OF DELIVERY SCIENCE

What is delivery science?

Delivery science includes research and training to understand and improve health care delivery. Health-related implementation research is the use of science to study practices in routine clinical care and public health systems in order to improve the quality and equity of health care. It also includes the study of factors that influence health care professionals and organizations and the factors influencing users of health care services, thus covering demand and supply. Implementation research often involves impact research, which includes research aimed at understanding what happens during the process of implementing a change in policy, program, or practice, and intervention studies, which are designed to compare different approaches to implementing change.

Robert Kern have defined “The science of health care delivery focuses on how patients actually receive care. From using engineering principles to determine the most efficient way to schedule patient appointments to research focusing on the most successful, cost-effective means for delivering treatment, this discipline's aim is to enhance the patient's experience with health care by improving quality, outcomes and cost. The main goal of science of health care delivery is to analyze, evaluate and implement care delivery models that improve value for patients (combining data analysis, engineering principles and health care delivery research)” The science of health care delivery applies innovative science and data to evaluate the quality, safety and value of health care globally, and improve real-world experiences for patients. The science of health care delivery is useful to address how to use data science and operational research methods to develop and evaluate new models of care; improve patient care and population health by studying, developing, and integrating clinical practice with the patient's community and translate research by applying tools and methodologies to create a learning health care system.

The current review of literature shows that health care delivery science is one of missing piece in health system area. WHO is mandated to support its Members states to be able to deliver safe, appropriate, effective, and quality services to the population through an integrated, patient centered health care approach. In this current context delivery science as transversal approach is an important strategy to address complexity of delivering health care in a way that keeps people healthy and provides quality health care at low cost. One of the current challenges is how to ensure access to services to more people, specifically the most marginalized and vulnerable and those living in remote areas.

There are vast amounts of resources being funneled into global health work, such as vaccines, primary health care, drug therapies, maternal and child health care, and basic surgery. Specifically for vaccines, WHO and international community has produced a lot of evidence and guidance on how to better deliver vaccines at the health care contact points (fixed or mobile). However, the greatest constraint is not

the availability of equipment, medicine, etc., but rather the way it is being delivered to those who need them most.

Why it is important?

- Delivery science is important to address the complexity of delivering health care and sustain high quality health care at low cost
- To address a range of implementation challenges, including complex processes, inefficient use of resources, inequitable allocation of resources, and supply and demand barriers to scaling-up and sustainability
- To improve the quality and equity of health care
- To support the development of multidisciplinary approach, encompassing both quantitative and qualitative approaches
- To develop mechanisms to compare different approaches to the delivery of global health services and their level of effectiveness, affordability and equity considerations
- To provide high accessibility of medical interventions including vaccines
- To address systems weaknesses in immunization programs
- Implementation research based on delivery science has an important role to identify challenges and successes, the possible impact of improving delivery (efficiency, efficacy, quality, costs, equity and sustainability issues)

What are the main challenges?

- Limited attention has been provided to the science of implementing interventions effectively and equitably in many parts of the world.
- Information and evidence is fragmented and focus only on some specific interventions rather than on the broader services as part of the health systems.
- A major proliferation of global health initiatives that continues to operate in isolation, at national level
- More research, case studies, anecdotes and other mechanisms of documenting experience are needed on issues of health care delivery including to demonstrate how to reach and benefit people
- Lack of information on the delivery of clinical interventions, target populations and lack of relevant health infrastructure, also they are incomplete at times, not tested and are not suited for the community
- Advocate bilateral and multilateral agencies including GAVI to support implementation research and the adequate use of delivery science to have better integration of vaccines delivery into the health system
- Absence of political will to invest on the science of health care delivery
- Lack of training on how to use delivery science to improve quality of care
- Harmonizing/ integrating the various area of delivery sciences
- Inadequate consideration of country and community context in delivering interventions
- - the lack of consideration for the voice of communities and citizens and specifically marginalized people
- The challenges are not just finance, supply and logistics but as well to consider enough in the large picture others issues such as community's voice, trust, communication, education, attitude, history, religion, politics and power.

It is evident that the traditional approach will not provide us with solution to complex issues that occur within the health system. We therefore, need new approaches. Various people have tried to explore these issues using various approaches using science and tapping on explicit and implicit knowledge of individuals and communities.

- There is an overall lack of consideration for all the elements of health systems (or integrated approach) and the context of their application.

Background and role of delivery science

A World Health Organization May 2008 consultation report entitled “**Maximizing Positive Synergies between health systems and Global Health Initiatives**”¹ reports on this process. The document carefully outlines the need for this type of solution, the knowledge-gathering process and coordination required to achieve it, and offers examples of existing work that is being done in the area. Within the larger framework of global health, this concept is part of the goal of developing a “science of delivery,” and addressing the proliferation of global health initiatives that operate in isolation.

As per Kim et.al. (2013), it is difficult to address the ever-increasing, unsustainable costs of health care without getting to the foundation of how health care is provided. Nor can we achieve the social and moral goals we share – care that is safe, appropriate, effective, people centered and integrated in every community – without rethinking and redesigning delivery. Real improvements require a multidisciplinary approach that will bring the best minds to focus on the problem. Experts in management, systems thinking and engineering, sociology, anthropology, economics, medicine, health policy, and other fields must join together to fix the delivery system.” In addition, the authors have provides detailed information on the global role of health care delivery science, for example; the need to redefine the global health care delivery; ensure access to appropriate information to both population and individual level; Improve understanding of harmful practices associated with delivery science; an opportunity to understand and reduce wastage and improve efficiency; need to scale up integrated service delivery and strengthen district health systems.

Today, part of the reason for delivery failure is due to the lack of health infrastructure in many low and middle income countries. Due to this, the global health community faces an unprecedented challenge of transferring vast amounts of resources to individuals, often in rural and remote locations, with little-to-no infrastructure to work through. Several steps exist in the process of achieving successful health outcomes: the discovery of a drug or intervention, its development and production, and lastly, its delivery. It is this final link in the chain that poses the most formidable challenge to

¹ World Health Organization. (2008). Maximizing Positive Synergies between Health Systems and Global Health Initiatives: Report on the Expert Consultation on Positive Synergies between Health Systems and Global Health Initiatives. *Geneva, Switzerland: WHO.*

the success of global health endeavors. It is very well recognized that this is not a stand alone problem but rather a complex one as it falls within the health system, which is complex. In other words, anything that falls within the health system has to be dealt with through a wider lens. WHO therefore recommends that one of the ways to reduce the difficulties related to health care services should be to ensure that all services are provided through “an integrated, people centered service delivery approach”. WHO has recently developed the strategy on Integrated people-centered service delivery, which should be widely shared with all entities involved in providing health care services, including, countries, NGOs, and policymakers what are the current best practices, cases studies and lessons learned in delivery science. Having said that, this area still needs to be explored and researched further, including the levels of effectiveness, affordability and equity issues among many.

Vision and mission of WHO in delivery sciences

In WHO, health care delivery research build from the results of operations research, participatory action research, management science, quality improvement, implementation science and research, and impact evaluation and requires flexible designs to account for the changing contexts and interventions. It addresses a range of implementation challenges, including complex processes, inefficient use of resources, inequitable allocation of resources, and supply and demand barriers to scaling-up and sustainability.

For vaccine and immunization, the Global Vaccine Action Plan (GVAP) highlight the importance of improving delivery of immunization services to achieve its goals. More specifically, the GVAP request members states, WHO and all others stakeholders to improve the logistics and the delivery of services to the hard to reach population. This implies WHO and others to have better knowledge about the issues related to unvaccinated and under-vaccinated children, delivery science are therefore crucial element. WHO has encouraged the operational research on delivery of vaccination, the logistic of vaccination and the demand and hesitancy from communities and individuals.

Activities of WHO in delivery sciences at global, regional and country levels

In the context of vaccine and immunization, WHO has been focusing mainly on implementation research as an important step towards achieving an increase in vaccine coverage and the uptake of new vaccines. Implementation research is highly complex and requires participation of stakeholders from diverse backgrounds to ensure effective planning, execution, interpretation, and adoption of research outcomes. It is highly contextual and depends on social, cultural, geographic, and economic factors to make the findings useful for local, national, and regional applications. Implementation research has an important role in accelerating the introduction and sustained use of vaccines in older children and adults.

The science of implementing interventions, in an effective, efficient, and equitable manner has received inadequate attention, in many regions of the world, where research capacities are also limited.

Tools provided by WHO

The strategic framework for vaccine implementation research have been defined within the WHO Initiative for Vaccine Research (IVR) Strategic Plan 2010–2020

The WHO Research for Health Strategy adopted by the 2010 World Health Assembly builds on the Mexico Ministerial Summit (2004) and the Bamako Global Ministerial Forum on Research for Health (2008), both of which reiterate the importance of focusing on research to promote knowledge translation.

At global level

Implementation research have been used by WHO specifically for annual Vaccination Week (now expanded globally), the elimination of rubella and congenital rubella syndrome, measles eradication, the introduction of vaccines against rotavirus, human papillomavirus, and influenza, and the ProVac Initiatives. Taken together, these vaccine delivery-related initiatives have led to the deployment and provision of lifesaving vaccines in this geographic region.

Vaccine and immunization area have been able through the integration of others interventions into the health system to take in consideration broadly principal components of health systems: structures, equipment and supplies, policies (technical priorities, financing), people (their numbers, distribution, and skills mix), and processes (how people function within the system and in relation to other sectors). Today many efforts are focused on how these components articulate among each another and the communities in which they are based, their effectiveness, and opportunities for modification are also framed by the social and political context in which they have evolved.

At regional level

WHO African region have been able to implement the initiative African Vaccination Week (AVW) lead by the Member States from Africa, which aimed at promoting vaccination and ensuring equity and access to its benefits. The initiative has proven to be particularly effective in reaching populations with limited access to regular health services as well as providing an opportunity to integrate other interventions with immunization services. Integration of other interventions with immunization during AVW, in the African Region is common and has shown potentials for improving immunization coverage, as this dedicated period is used both for catch-up campaigns and periodic intensified routine immunization. While its impact may call for further examination, it is a potential platform for integrated delivery of health interventions to people with limited access to regular health service.

At country level

WHO usually plays catalytic role with the partners to implement research activities in the area of service delivery. For examples, in its “reach every district, reach every community” through reference strategy, WHO encourages countries and partners to identify the challenges behind low coverage for specific population.

Delivery science research results at country level identified several issues related to low coverage

Importance of political will

The study of regional inequity and vaccine uptake in Malawi revealed the presence of clusters of under-vaccinated children, leading to increased vulnerability during outbreaks of vaccine-preventable diseases. This study also suggested that there is substantial potential for political intervention to improve the current state of immunization

Importance of taking into consideration local context and to ensure a quality monitoring and evaluation system

The strength of childhood immunization in South Africa comes from having a framework for intervention that not only is strong but that requires implementation to be tailored to local circumstances and accompanied by high-quality monitoring and evaluation

Importance to retain skilled staff at rural areas

Experiences in Mali indicate that sustained immunization efforts will require improvements in staffing, financing, and delivery-related guidelines to ensure the presence of skilled staff at the periphery

An experience from one state of Sudan, revealed that the government must make greater efforts in funding, provision of skilled manpower and delivery mechanism to achieve higher rates of vaccination in rural areas.

Importance of continuity of health care services

In a study in Burkina Faso that investigated rates of coverage and determinants of complete vaccination in rural areas, researchers found that continuity of health care services from prenatal care to institutional delivery created families' loyalty to health services and was closely associated with communities' rates of child vaccination

Importance of immunization intervention package

An immunization intervention package (including service schedule, training for service providers on valid doses and management of side-effects, a screening tool to identify immunization needs among clinic attendants, and an immunization support group for social mobilization) was found to dramatically improve child immunization coverage in urban slums of Dhaka, Bangladesh

Importance of system thinking approach

A recent study have highlighted that managing through health systems, and not being overly reliant on committees, will be more beneficial and expand the reach of immunization and maternal and child health care services in developing countries. Careful characterization of health system problems within a specific country context can generally improve the efficiency of delivery and access.

Examples of case studies are related to the introduction of new vaccines for low- and middle-income countries

A case study from six low resource setting, on the impact of introducing new vaccines on the health system, showed that the new vaccines were viewed positively and seemed to integrate well into existing health systems. The introductions were found to have had no impact on many elements within the building blocks framework. Despite many key informants and facility respondents perceiving that the new vaccine introductions had increased coverage of other vaccines, the routine data showed no change. Positive effects perceived included enhanced credibility of the immunization programme and strengthened health workers' skills through training. Negative effects reported included an increase in workload and stock outs of the new vaccine, which created a perception in the community that all vaccines were out of stock in a facility. Most effects were found within the vaccination programmes; very few were reported on the broader health systems. Effects were primarily reported to be temporary, around the time of introduction only.

The case study from the United Republic of Tanzania on costing nationwide HPV vaccine delivery using the WHO Cervical Cancer Prevention and Control Costing Tool show when a country expand its immunization schedules with new vaccines such as the HPV vaccine, it faces initial cost to fund critical pre-introduction activities, as well as incremental system costs to deliver the vaccines on an ongoing basis. In anticipation, governments need to plan ahead for non-vaccine costs so they will be financed adequately. Existing human resources need to be re-allocated or new staff need to be recruited for the program to be implemented successfully in a sustainable and long-term manner. The financial delivery costs of nationwide HPV vaccination are higher than those of infant vaccines and can be substantial in resource-poor settings since it requires building up new delivery channels (like more transport of vaccines and health workers and more intensive IEC activities).

The case study on the contribution of primary care to health and health systems in low- and middle-income countries. It is critical review of major primary care initiatives have showed there is also evidence that primary care programs have reduced child mortality and, in some cases, wealth-based disparities in mortality. Lastly, primary care has proven to be an effective platform for health system strengthening in several countries. Future research should focus on understanding how to optimize the delivery of primary care to improve health and achieve other health system objectives (e.g., responsiveness, efficiency) and to what extent models of care can be exported to different settings. The majority of primary care programs had multiple components from health service delivery to financing reform to building community demand for health care. Although given this integration and the variable quality of the available research it was difficult to attribute effects to the primary care component alone, we found that primary care-focused health initiatives in low- and middle-income countries have improved access to health care, including among the poor, at reasonably low cost.