

## Status of Immunization and Need for Intensification of Routine Immunization in India

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Vaccines have made a major contribution to public health but vaccines-preventable diseases (VPDs) are still responsible for significant deaths of under-five children. Despite Global efforts, the coverage in two WHO regions namely Africa and South-East Asia (SEA) still remain short of set targets for 2010. As a result, the SEA Regional Director has declared 2012 as the Year for Intensifying Routine Immunization (RI) in the Region.

The recent immunization coverage surveys in India have shown gradual albeit a slow progress in the performance of RI in India over last few years but in some states the coverage is still quite low. Several new initiatives like introduction of Hepatitis B vaccine, second dose of Measles vaccine and pentavalent vaccine (two states), JE vaccine rounds, framing of the National Vaccine Policy, etc. are welcome steps. The challenges and barriers to achieve high immunization rates in the country are well recognized. Almost non-existence of an effective VPD surveillance system in the country has further compounded the problem. The need is to address all the barriers to achieve high RI rates, which should include induction of innovative methods, proper monitoring of the program, improving operational efficiency and 'reaching every community', and integrated delivery of health interventions along with immunization. The development of an efficient VPDs surveillance, adverse event following immunization (AEFI) monitoring and post-marketing surveillance systems will go a long way in ensuring satisfactory performance of the health system. The decades old Expanded Program of Immunization (EPI), which was adopted in India as universal Immunization Program (UIP) also needs a revamp with inclusion of certain new vaccines. Decisions on implementing new and underutilized vaccines require scientific evidence and data, a reliable supply of affordable vaccines, which are adapted to the country's immunization schedule, and an integrated disease monitoring and surveillance system.

**Key words:** Immunization coverage, India, Newer vaccines, Routine immunization.

Vaccine preventable diseases (VPDs) are still responsible for about 25% of the 10 million deaths occurring annually among children under five years of age [1]. In 2005, the 58th World Health Assembly (WHA), recognizing the role that vaccines and immunization can play in reducing under-five mortality, welcomed the Global Immunization Vision and Strategy (GIVS) 2006–2015 developed by WHO and UNICEF as a framework for strengthening national immunization programs [2]. The specific goals of GIVS are achieving 90% DTP3 coverage at national level and 80% coverage at district level [2,3]. The collective recognition of immunization's potential has further led the global health community to call for the "Decade of Vaccines" (DoV) [4]. The purpose of the DoV is to extend, by 2020 and beyond, the full benefits of immunization to all people, regardless of where they are born, who they are, or where they live. In May 2011, the 64<sup>th</sup> WHA endorsed the development of a Global Vaccine Action Plan (GVAP). This plan is built on the success of the GIVS and is aimed to bring all stakeholders together to ascertain collectively what countries and the entire immunization community wants to achieve over the next

decade, determine concrete actions to make change happen, and define indicators and processes to monitor and evaluate progress [5].

Considering the poor state of routine immunization (RI) in few countries of South East Asia Region (SEAR), the SEAR director has declared 2012 as the Year for Intensifying Routine Immunization in the region to catalyze all immunization systems stakeholders [6]. This initiative will focus on intensification of RI in 2012 and sustaining the coverage thereafter in countries with moderate immunization coverage.

### CURRENT STATUS OF IMMUNIZATION IN INDIA

Universal Immunization Program (UIP) performed quite well in the first decade of its introduction in India. Between 1985 to 1995, the coverage levels for various vaccines reached 70-85% and the incidence of various VPDs rapidly declined in the country [7]. However, since then, there has been a decline by 15 to 20% in the coverage of different vaccines [7]. Surveys carried out during National Family Health Survey (NFHS) I, II and III and by independent agencies such as UNICEF, have revealed that the coverage levels may be lower by as

much as 15-40% (8,9), compared to reported levels of coverage in the UIP. Indeed, there are a few states in India that have efficiently running UIP and several that do not.

According to most recent Coverage Evaluation Survey (CES) 2009, a nationwide survey covering all States and Union Territories of India conducted during November 2009 to January 2010 by UNICEF, the national fully immunized (FI) coverage against the six vaccines included in UIP in the age-group of 12-23 month old children is 61% whereas it was 54.1% and 47.3% as reported by District Level Household and Facility Survey (DLHS-3) (2007-08) and NFHS-III (2005-06), respectively [8-10]. Regarding coverage of individual antigens in the similar age group, the CES 2009 reported BCG, OPV and DTP3 doses coverage, and measles first dose coverage as 86.9%, 70.4%, 71.5%, and 74.1%, respectively (9). The corresponding figures cited by DLHS-3 and NFHS-3 were 86.7%, 66%, 63.5%, and 69.5%, and 78.1%, 78.2%, 55.3%, and 58.8%, respectively [8,10]. As far as newer antigens are concerned, the 3 doses of Hepatitis B vaccine coverage among children 12-23 months in 16 States/UT where it is part of UIP evaluated to be 58.9% by CES 2009 [9]. However, birth dose administration is still a challenge in all these states.

There is gradual albeit a slow progress in the performance of RI in India over last few years. There is marginal improvement in many states recently. Six states with high population contribute to 80% of 8.1 million unimmunized children in the country, 52% of the total unimmunized reside in Uttar Pradesh and Bihar alone [11].

### ***New initiatives***

The UIP in India targets 27 million infants and 30 million pregnant women every year. Since the launch of National Rural Health Mission (NRHM) in 2005, more than 15 billion dollars have been provided to the states in addition to their budgets, for strengthening health systems and infrastructure with key focus on reproductive and child health, including immunization [12].

India has introduced vaccine for Japanese Encephalitis in 111 districts in 15 states having a high disease burden. Hepatitis B vaccine, earlier introduced in 10 states, is now being extended to the entire country. Introduction of the second dose of measles, and Hib containing pentavalent vaccine, initially in two states as part of routine immunization are other major initiatives [12]. Another major step has been the framing of the National Vaccine Policy [13]. India has also joined the global post-marketing surveillance network for reporting AEFI associated with new vaccines and Maharashtra is the participating state.

### ***Barriers to achieve high RI rates***

In a recent study conducted in 225 villages in 12 districts spread across the Western, Central and Eastern regions of Uttar Pradesh, lack of faith in vaccination at the family level, particularly among family elders, lack of vaccine-related knowledge, fear of side effects of vaccination, lack of family support, lack of knowledge of the place and day of immunization, uncertainty of service provision, and limited counseling by health workers were found to be major barriers to achieve high RI rates [14]. Less than 20 percent of women were aware that vaccinations can protect a child against whooping cough, TB and diphtheria. Nine percent of women and 11% of ASHAs reported non-availability of the ANM on the scheduled immunization day as a reason for no or partial immunization. On the other hand, women's education, knowledge of the next scheduled immunization date, knowledge of the side effects of vaccination, awareness of risk if the child is not fully immunized, credibility of frontline workers as a source of information, and ensuring the availability of health providers and supplies were found to be key facilitating factors for full immunization [14].

Apart from the above mentioned barriers, there are some other challenges to achieving high RI rates and they include inadequate delivery of health services (supply shortages, vacant staff positions, lack of training); lack of accountability, inadequate supervision and monitoring; lack of micro-planning at district level; general lack of inter-sectoral coordination resulting in missing opportunities to improve immunization coverage and quality; lack of support for ANMs from other staff at the health centers; parental time constraints and parental non-acceptance of immunization [15]. The above barriers are further compounded by a weak VPD surveillance system in the country. There is lack of disease burden data on many important VPDs in India that results in the perception that the disease is not important public health problem. Further, there is utter lack of diagnostic tools for certain VPDs. Lack of baseline surveillance data also is a bottleneck in monitoring the impact of vaccination. These challenges need to be addressed to improve the Immunization Program's performance in India.

### **WHAT IS NEEDED?**

#### ***Address the barriers to achieve high RI rates***

Focus should be on increasing demand for vaccination by using effective IEC and bringing immunization closer to the communities. The immunization services provided at the fixed sites should be improved. There should be better monitoring and supervision, and district authorities

should be made accountable for the performance of RI in their district [15].

### ***Induct innovative methods to improve RI***

The number of immunization ‘delivery points’ especially in rural and remote areas having poor access to health facility, should be increased. ‘Immunization booths’ should be constructed at every locality in urban areas particularly in slums, and local municipality board member should be made accountable for their performances. Large and varied cadres of volunteers, including, for example, local medical practitioners, pharmacists, chemists and retired nurses and other health personnel can be recruited to offer immunization services. Proper training including maintenance of cold chain and basic minimum education on vaccines must be imparted to all of them. Complete immunization should be made mandatory to get admission in school by appropriate legislation. Incentives in cash and kind may be offered to those families having fully immunized kids.

### ***Proper monitoring of the program***

The unsatisfactory performance of UIP in India is due to managerial, administrative and governance-related inadequacies, and not due to financial constraints or technical inadequacies [16]. The need to monitor the progress of control of diseases under UIP has not been realized; one element of the poor performance of UIP is precisely this lack of monitoring.

To target only the coverage reached with different vaccines may be misleading and may fall short of achieving full objectives. The more important item to be monitored is the ‘impact’ or ‘output’ of entire vaccination program. ‘Output’ consists of disease reduction and demand creation. The neglect to monitor and measure the outcome is the most glaring defect in the UIP system [16]. Outcome measurement by disease surveillance is essential to evaluate the success of UIP and to assess input efficiency. Every “case” detected under UIP is evidence of the success of the monitoring process as well as evidence for suboptimal output of UIP or suboptimal efficacy or schedule of a particular vaccine that call urgent remedial measures [16]. This will allow program managers to move beyond the monitoring of immunization coverage and understand the broader impact of immunization on disease reduction.

### ***Develop effective surveillance systems***

UIP can seize the opportunity and establish a surveillance system for all important childhood infectious diseases. As has been demonstrated by the AFP surveillance network in India, efficient surveillance systems can be established,

even in resource-poor settings, at quite low cost relative to the cost of the intervention itself. Where appropriate, this network should serve as the platform both for an integrated disease surveillance system that provides epidemiological data on other communicable diseases, and for detection and response to emerging infectious disease threats. Funding for disease surveillance is usually disease specific and time limited. In the presence of weak national systems, parallel systems tend to be established in order to generate data suited to the needs of specific programs. Integrated Disease Surveillance Project (IDSP)- a state based decentralized surveillance program in the country launched by Ministry of Health and Family Welfare, Government of India (GoI) in November 2004, and IDSurv—a web-based infectious disease surveillance program developed by IAP—are laudable efforts in this regard [17,18]. These uncoordinated efforts may address short-term needs, but we need more comprehensive, coordinated efforts in the line of Active Bacterial Core surveillance (ABCs)-a population-based surveillance system run by Centers for Disease Control and Prevention (CDC), Atlanta in US [19]. Similarly, there is need of having a functional real-time adverse event following immunization (AEFI) and post-marketing surveillance system in the country.

### ***Relook at the UIP in India***

The decades old Expanded Program of Immunization (EPI) which was adopted in India as UIP needs a revamp with inclusion of certain new vaccines. On immunological basis also the EPI schedule currently adopted by many countries is not impeccable [20].

Can India think of deviating from the WHO recommended 6, 10, 14-week schedule and consider immunologically more sound and appropriate 2, 4, 6-month schedule? Besides ensuring superior immunogenicity, it has the advantage of facilitating visits at the crucial ages of 4 and 6 months when infants are being weaned (from breast feeding) and hence vulnerable to development of malnutrition in the absence of proper nutritional advice. It will also help to reduce the large gap and hence drop-out rate (between the third DPT at 14 weeks and measles vaccine at 9 months) and thereby ensure implementation of more comprehensive child health practices like growth monitoring, nutritional advice, etc [20]. The latter schedule will also be more appropriate immunologically once many new vaccines like *H. influenzae b*, rotavirus, pneumococcal, etc are also incorporated in the UIP. Apart from the proper schedule for UIP, one also needs to address the issue of poor, ineffective quality of vaccines like BCG. Incorporation of second dose of measles-containing vaccine in the Indian

UIP is a welcome move.

### ***Integrated delivery of health interventions***

Strengthening of immunization systems in such a way that they support and integrate with other preventive health services like providing vitamin A supplementation, deworming, growth monitoring, distribution of insecticide-treated bed nets, etc. offer the opportunity to create synergies and facilitate the delivery of services to bolster comprehensive disease prevention and control. Incorporating immunization into integrated primary health care programs may also facilitate social mobilization efforts, help generate community demand for services and address equity issues. The strategy of child health days, led by UNICEF, has also helped to promote routine immunization [21].

### ***Improving operational efficiency and 'Reaching every community'***

Urgent action needs to be taken to re-design and re-define the roles and responsibilities and, working relationships among the three levels: the center, state and district. The best level to achieve and monitor disease control by vaccinations is local, sub-district level, supervised and coordinated at district level. In other words, the UIP system must be district-based in terms of inputs, output and monitoring/evaluation. In 2002, WHO, UNICEF, and other partners introduced the concept of "Reaching Every District," which was a first step toward achieving more equitable coverage. This approach has started yielding good results wherever it was introduced [22]. To go even further, the experience of successful polio vaccination campaigns that have aimed to reach every child, even those outside of typical government outreach, can be leveraged, and the "Reach Every District" strategic approach can be recast as "Reaching Every Community."

### ***Clear-cut policies on new/ underutilized vaccines***

In a situation where there is abundance of new and expensive vaccines on one hand and limitations of resources on the other, it becomes imperative that use of vaccines through introduction in the UIP as well as in the free market is done through a framework of decision-making that confers positive health and economic benefits to the society.

Decisions on implementing new and underutilized vaccines require scientific evidence and data, a reliable supply of affordable vaccines, which are adapted to the country's immunization schedule, and an integrated disease monitoring and surveillance system. The fast progress in introducing new vaccines has been facilitated by member states' growing recognition of the value of the

protection conferred by vaccines and immunization. Such progress has also been made possible by the establishment of global financing mechanisms, including the Global alliance for Vaccines and immunization (GAVI), and the important role played by regional procurement mechanisms.

Although introduction of new vaccines is important, this should not be at the expense of sustaining existing immunization activities. Instead, the introduction of a new vaccine should be viewed as an opportunity to strengthen immunization systems, increase vaccine coverage and reduce inequities of access to immunization services [23].

### **CONCLUSIONS**

Developments in vaccines and immunization provide us with tremendous opportunities to impact the health of our populations, particularly the health of poor and marginalized communities who carry a disproportionate burden of disease. Now is the time to seize this momentum and commit to achieving immunization's full potential. Immunization is, and should be recognized as, a core component of the human right to health and a personal and collective community responsibility.

To be successful in the future, we must tackle the technical, logistics, political and social obstacles that are hampering progress in reaching every child with available vaccines. Indeed, both coverage expansion to reach the never/unreached with traditional EPI vaccines and the addition of a number of new vaccines available in coming years are critical elements of global health. Much remains to be done if the full potential of immunization is to be exploited in achieving the health-related MDGs.

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