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Introduction

IMMUNIZATION IN INDIA — PAST, PRESENT AND FUTURE

Immunization forms a critical component of primary health care, and ensures nation's health security. Although international agencies such as the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and now the Global Alliance for Vaccines and Immunization (GAVI) provide extensive support for immunization activities, the success of an immunization program in any country depends more upon local realities and national policies. This is particularly true for a huge and diverse developing country such as India, with its population of more than 1 billion people, and 25 million new births every year.

The history of vaccine research and production in India is almost as old as the history of vaccines themselves. During the latter half of the 19th century, when institutions for vaccine development and production were taking root in the Western world, the British rulers in India promoted research and established about fifteen vaccine institutes beginning in the 1890s. Prior to the establishment of these institutions, there were no dedicated organizations for medical research in India. Haffkine's development of the world's first plague vaccine in 1897 which he developed at the Plague Laboratory (Mumbai, India), later named the Haffkine Institute and Manson's development of an indigenous cholera vaccine at Kolkata during the same period bear testimony to the benefits of the early institution of vaccine research and development in India. Soon, Indian vaccine institutes were also producing

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tetanus toxoid (TT), diphtheria toxoid (DT), and diphtheria, pertussis, and tetanus vaccines (DPT). By the time Indians inherited the leadership of the above institutions in the early 20th century, research and technological innovation were sidelined as demands for routine vaccine production took priority. However, after independence, it took three decades for India to articulate its first official policy for childhood vaccination, a policy that was in alignment with the WHO's policy of "Health for All by 2000" (famously announced in 1978 at Alma Ata, Kazakhstan). The WHO under its Expanded Program of Immunization (EPI) recommended universal immunization of all children to reduce child mortality. In line with Health for All by 2000, in 1978 India introduced six childhood vaccines (Bacillus Calmette-Guerin (BCG), TT, DPT, DT, polio, and typhoid) in its EPI. Measles vaccine was added much later, in 1985, when the Indian government launched the Universal Immunization Program (UIP) and a mission to achieve immunization coverage of all infants and pregnant women by the 1990's. Even though successive governments have adopted self-reliance in vaccine technology and self-sufficiency in vaccine production as policy objectives in theory, the growing gap between demand and supply meant that in practice, India had increasingly to resort to imports. Similarly decision of production of inactivated polio vaccine in the country was revoked more than two decades ago for no known reasons.

The vaccination coverage at present with EPI vaccines is far from satisfactory (DPT3 55%). One of the factors responsible for this dismal coverage is highly focused attention on polio eradication program for last 13 years at the cost of other health programs including immunization against other vaccine preventable diseases. An urgent need at present is to strengthen routine immunization coverage in the country with EPI vaccines.

An equally pressing need at present is to introduce more vaccines in EPI. The last couple of decades have seen the advent

of many new vaccines in the private Indian market. In fact, all vaccines available in the developed world are available/will soon be available in India. However, most of these vaccines are at present accessible only to those who can afford to pay for them. Paradoxically, these vaccines are more often than not required by those who cannot afford them. The Government has introduced some of the newer vaccines such as MMR, Hep B and Hib into the EPI of certain districts. Expanding coverage with these vaccines and introducing new vaccines which are cost effective in the Indian scenario are urgently required. A rethink into the polio eradication strategy and appropriate introduction of inactivated polio vaccine in the national immunization time table is also warranted.

There are several other areas in the national immunization program that need a revamp. Vaccine production by indigenous manufacturers needs to be encouraged to bring down costs, reduce dependence on imports and ensure availability of vaccines specifically needed by India (e.g. typhoid) and custom made to Indian requirements (rotavirus and pneumococcal vaccines). The recent vaccination related deaths signal a need for improving immunization safety and accountability and setting up of an adverse event monitoring system. Finally setting up a system for monitoring incidence of vaccine preventable diseases and conducting appropriate epidemiological studies is necessary to make evidence based decisions on incorporation of vaccines in the national schedule and study impact of vaccines on disease incidence, serotype replacement, epidemiologic shift, etc.

It is undoubtedly a difficult road ahead. A proactive approach is needed to ensure that Indian children are not deprived of immunization, one of the most effective public health strategies ever.