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Reluctance to Advance the Age of Measles Immunisation: Ethics of Best Bargain, Policies of Denial, and Programs of Verticality

Sanjay Chaturvedi*

Department of Community Medicine,University College of Medical Sciences and GTB Hospital, Delhi, India

***Corresponding author:** Sanjay Chaturvedi, Professor and Head, Dept of Community Medicine, University College of Medical Sciences, Delhi-110095, India, Tel: 91-11-22582974, 22592974 ext 5303; Fax: 91-11-22590495; E-mail: cvsanjay@hotmail.com

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Abstract

There is much expectation that the unprecedented social and political mobilization of polio initiative must be channelized to eliminate and eradicate measles. However, the fact file of measles in low and middle income countries (LMICs) raises several concerns. Measles surveillance in many of these countries is largely outbreak-centric and measles associated mortality is underestimated because several events are documented as pneumonia deaths even after verbal autopsies. Besides vaccine hesitancy, the social and cultural resistance against polio supplementary immunisation activities (SIAs) witnessed in certain pockets is likely to be higher in case of measles immunisation drives. The timing of measles containing vaccines (MCV1 and MCV2) in the immunisation schedules is also surrounded by some technical and ethical issues that we have been ignoring for decades. A small proportion of measles infection is borne by young infants before reaching eligibility for vaccination. Eradicating measles is going to be a tougher challenge on epidemiological grounds also. With basic reproduction number (R0) ranging from 12 to 18 and herd immunity threshold from 92% to 94%, maintaining very high routine immunisation (RI) coverage for a long period will require a cross-sectoral commitment at all levels of operation in LMICs. There are serious ethical issues related to policy, program and governance as well. Health systems in most of the LMICs are historically conditioned in the culture of verticality to an extent that even those who have an ethical responsibility to represent context-specific local voices end up taking an easier route of generic global narrative. An unstated and unappreciated divide between public health and people's health looks too big to be bridged in such a milieu of governance. The endgame success of any global disease eradication program would decisively depend on two constituencies-frontline health workers and non-utilizer clients who could have been the utilizers.

Keywords: Measles; Eradication; Immunisation; Vaccination; Community-based

Commentary

Inspite of some serious reversals, the global scenario at the polio eradication front looks promising, and there is much expectation that the unprecedented social mobilization and buildup of a global program must be channelized to eliminate and eradicate other vaccine preventable diseases. Measles, intuitively, appears as a very strong candidate in this short list. In fact, measles should have been at the centre of global agenda immediately after eradication of smallpox. The disease burden of measles has always been comparable to any major pediatric health problem. Very much like variola, measles does not have any extra-human reservoir, has no sub-clinical cases, has an easily identifiable clinical syndrome, and we had an effective vacicine against it. How measles lost out to polio at that stage would always be debated without a clear answer. Surely, the reasons were not purely technical. May be, some extrinsic reasons also helped the cause of polio, besides epidemiological considerations.

Response to the problem of measles in low and middle income countries (LMICs) is punctuated with several issues. In many of these countries, measles surveillance revolves around the case counts in outbreaks. Mortality associated with measles is generally underestimated. Several such events are recorded as pneumonia related deaths even after verbal autopsies. The coverage of measles routine immunisation (RI) is suboptimal, especially with the second shot of measles containing vaccine (MCV2). Its delivery through supplementary immunisation activities (SIAs) has its own unique problems since it is not an oral drop. Unlike polio, measles vaccine has to be reconstituted on the site of outreach activity or campaign, and has to be delivered through injection. For this reason, social and cultural resistance against measles immunisation campaigns is likely to be higher than what we are witnessing against polio SIAs in certain areas. Qualitative evidence that emerged from some hotspots in India through perception mapping and deconstruction of such resistance is indicative of a bigger resistance against injectable vaccines [1,2].

A renewed focus on measles eradication would also bring the timing of measles containing vaccines (MCV1 and MCV2) to the centre. We have been ignoring some technical and ethical issues surrounding this debate for decades. Many young infants suffer with measles before being eligible for vaccination. Analysis of a large dataset from European countries has revealed that during an outbreak, the proportion of measles cases affecting young infants may widely vary from 0.25% to 83.0% [3]. In LMICs, maternal antibody levels against measles may be much lower and severe outbreaks of measles can occur in younger infants. Even if the case fatality is not so high in this group, presence of a reservoir of infection would always create problems as we reach the post of elimination. These issues were argued as early as in the 1970s by several researchers, even when we had the Schwartz strain vaccine-with higher susceptibility to maternal antibodies [4,5]. Today, the standard Edmonston-Zagreb vaccine that we use in the programs has shown 94% protective efficacy even among infants aged 4.5 months [6]. Immediate goal of high coverage in target age groups

may not be delinked from the need for timely immunisation. The resulting argument is that we need to use this first opportunity for measles vaccination among younger infants, not as substitute but as supplement to the vaccine given at 9-15 months [7].

Results of randomized controlled trials in LMICs were available since early 1990s suggesting that measles vaccination may be effective as early as 6 months of age, even with Schwartz strain. Recommendations for measles vaccination at 6 months were being made especially for children living in densely populated areas like urban slums [8]. Although it is now widely accepted that advancing the MCV1 could reduce the burden of disease, [3,9] measles vaccination is not being systematically recommended before 9 months of age in the European Union because of dysmature humoral immune response of infants [3]. One has to underline that this would apply more to children in LMICs. And of course, there are long standing arguments that advancing the age of MCV2 would have considerably higher preventive impact among vaccinees than advancing the age of MCV1 or introducing an extra early vaccination. This argument is supported by a mathematical model of the impact of antibody level on seroconversion and immunity while estimating measures of protection among vaccinees (percentage of susceptibles, number of reported cases, percentage of lifetime spent susceptible) [10]. The importance of MCV2 coverage has again been highlighted in a recent report from India which demonstrated high measles incidence and frequent outbreaks inspite of above 90% MCV1 coverage [11]. There may be several reasons behind this, ranging from immunological to operational.

Eradicating measles is going to be much difficult a challenge even on the theoretical grounds of infectious disease control. With basic reproduction number (R_0) ranging from 12 to 18 and herd immunity threshold from 92% to 94%, we will have to maintain a very high RI coverage for several years. This will require a sustained level of commitment in all the key sectors of operation in LMICs. Although measles has a commonality with smallpox in not having sub-clinical infection, polio is closer to variola in terms of R_0 (5-7 vs. 6-7) and herd immunity threshold (80-86% vs. 83-85%). The best strategy against measles would be to go big and go fast. Critical question is how to do it without looking like another top-down technical mission of mammoth magnitude with a dedicated surveillance system. Throwing a vertical program on people by giving it a community-based facade is something that we have witnessed through later half of twentieth century, the new age programs will have to learn to make it community-owned as well [12]. Force of international advocacy is so overwhelming in LMICs that the voice of local stakeholders finds it difficult to acquire a critical mass and space to shape local policies and programs. Health systems in most of the LMICs are historically conditioned in the culture of verticality to an extent that even those who have an ethical imperative to represent context-specific local voices end up taking an escape route of generic global opinion. As a result, a large number of frontline health workers feel that they are not even a peripheral part of decision making process. Many of them keep working with low level of motivation and a sense of alienation. This gap is being closely watched by a critical constituency of non-utilizer clients. The most worrisome spin-off emerging from this failure of international health systems in mainstreaming frontline health functionaries is further marginalisation of the non-utilizer clients. An unstated and unappreciated divide between public health and people's health looks too big to be bridged in such a milieu of governance. The endgame success of any global disease eradication program would decisively depend on two constituencies-frontline health workers and non-utilizer clients who could have been the utilizers.

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