Vaccine 31 (2013) 1259–1263

Contents lists available at SciVerse ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Brief report

Use of measles supplemental immunization activities (SIAs) as a delivery platform for other maternal and child health interventions: Opportunities and challenges

Mira Johri[a,b,*], Jitendar K. Sharma[c], Mark Jit[d,e], Stéphane Verguet[f]

[a] International Health Unit (USI), University of Montreal Hospital Research Centre (CR-CHUM), Édifice St-Urbain 3875, rue St-Urbain, 5e étage, Montreal, Québec, Canada H2W 1V1
[b] Department of Health Administration, Faculty of Medicine, University of Montreal, Montreal, Canada
[c] Independent Consultant, New Delhi, India
[d] Health Protection Agency, 61 Colindale Ave., London, NW9 5DF, United Kingdom
[e] Department of Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine, Keppel Street, London, United Kingdom
[f] Department of Global Health, University of Washington, 325 9th Avenue, Box 359931, Seattle, WA 98104, USA

ARTICLE INFO

Article history:
Received 3 June 2012
Received in revised form
15 September 2012
Accepted 18 September 2012
Available online 5 October 2012

Keywords:
Measles vaccine
India
Immunization programs/organization and administration
Child health services
Maternal health services
Developing countries
Integrated service delivery

ABSTRACT

Measles supplementary immunization activities (SIAs) offer children in countries with weaker immunization delivery systems like India a second opportunity for measles vaccination. They could also provide a platform to deliver additional interventions, but the feasibility and acceptability of including add-ons is uncertain. We surveyed Indian programme officers involved in the current (2010–2012) measles SIAs concerning opportunities and challenges of using SIAs as a delivery platform for other maternal and child health interventions. Respondents felt that an expanded SIA strategy including add-ons could be of great value in improving access and efficiency. They viewed management challenges, logistics, and safety as the most important potential barriers. They proposed that additional interventions be selected using several criteria, of which importance of the health problem, safety, and contribution to health equity figured most prominently. For children, they recommended inclusion of basic interventions to address nutritional deficiencies, diarrhoea and parasites over vaccines. For mothers, micronutrient interventions were highest ranked.

1. Introduction

WHO and UNICEF recommend delivering two doses of measles-containing vaccine (MCV) to all children through routine services and supplementary immunization activities (SIAs) [1,2]. Intensified vaccination efforts have dramatically reduced measles mortality and increased child survival [1]. Globally, reductions in measles mortality due to widespread vaccination accounted for 23% of the estimated decline in all-cause child mortality from 1990 to 2008 [2,3]. However, millions of children remain as yet unprotected.

Although their primary purpose is delivery of a specific vaccine, WHO and UNICEF promote the use of SIAs to strengthen health services [4]. India, one of the 47 priority countries where measles burden is highest, represents a key country to investigate the potential for such an approach. Of the estimated 19.1 million children in 2010 who never received a first dose of measles vaccine, 6.7 million (35%) were in India [2].

To accelerate its measles control efforts, between 2010 and 2012, India is delivering a second opportunity for measles-containing vaccine (MCV) through mass vaccination campaigns targeting 135 million children aged 9 months to 10 years. The measles SIAs are taking place in 14 of India's 28 states and 7 union territories selected due to low (<80%) coverage of the first dose of MCV [1]. These 14 states contain 52% of India's population and

Abbreviations: BCG, Bacille Calmette–Guérin vaccine; DTP, diphtheria, tetanus and pertussis vaccine; HR, human resources; ITN, insecticide-treated bed net; NSF, insufficient; ICDS, Integrated Child Development Services; JE, Japanese encephalitis vaccine; MCH, maternal and child health; MCV, measles-containing vaccine; MHFW, Ministry of Health and Family Welfare; OPV, oral polio vaccine; ORS, oral rehydration salts; ORT, oral rehydration therapy; SEPIO, State Expanded Program of Immunization Officer; SIO, State Immunization Officer; SIAs, supplementary immunization activities; UIP, (India's national) Universal Immunization Program; WHO, World Health Organization; UNICEF, United Nations Children's Fund.

* Corresponding author at: Unité de santé internationale (USI), Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CR-CHUM), Édifice St-Urbain 3875, rue St-Urbain, 5e étage, Montreal, Québec, Canada H2W 1V1.
Tel.: +1 514 343 7318; fax: +1 514 343 2448.
E-mail addresses: mira.johri@umontreal.ca (M. Johri), jitendra9000@gmail.com (J.K. Sharma), mark.jit@hpa.org.uk (M. Jit), verguet@uw.edu (S. Verguet).

0264-410X/$ – see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.vaccine.2012.09.044

Table 1
Key child health indicators in 14 Indian states participating in the 2010–2012 measles SIAs.

State ($n = 14$)	Population[a] (millions)	Measles vaccine coverage pre-SIA[b] (%)	Left out (no vaccines)[c] (%)	Drop out[d] DTP1–DTP3 (%)	ORS[e] (%)	Any ORT[f] (%)	Vitamin A[g] (%)
Arunachal Pradesh	1.38	48.2	25.7	26.9	74.8	84.6	40.0
Assam	31.16	80.1	8.1	14.9	53.0	60.0	69.3
Bihar	103.80	58.2	15.2	23.9	22.4	40.4	49.0
Chhattisgarh	25.54	73.1	4.8	13.9	61.5	68.3	62.1
Gujarat	60.38	78.0	2.6	16.5	56.9	63.0	66.9
Haryana	25.35	79.9	4.3	6.6	74.3	79.8	55.9
Jharkhand	31.16	67.5	5.4	15.9	21.6	39.4	63.3
Madhya Pradesh	72.59	61.9	5.9	20.4	41.5	45.9	45.1
Manipur	2.72	60.3	11.9	10.8	75.7	82.9	47.9
Meghalaya	2.96	74.1	9.3	16.9	82.8	88.4	58.1
Nagaland	1.98	52.2	31.6	19.8	49.5	57.5	28.2
Rajasthan	68.62	65.6	15.6	20.9	39.2	48.9	59.9
Tripura	3.67	68.8	1.8	5.6	72.2	76.4	68.0
Uttar Pradesh	199.58	52.8	17.8	20.8	14.3	29.2	48.9
All India	1210.19	74.1	7.6	13.4	42.8	53.6	64.0

[a] Source [5].
[b] Percentage of children 12–23 months vaccinated against measles, pre-SIA [6].
[c] Percentage of children 12–23 months who received no vaccination [6].
[d] Percentage of children 12–23 months who received DTP1 but not DTP3 [6].
[e] Percentage of children less than 2 years of age with diarrhoea receiving oral rehydration salts (ORS) packet [6].
[f] Percentage of children less than 2 years of age with diarrhoea receiving any oral rehydration therapy (ORT) or increased fluid [6].
[g] Percentage of children 12–23 months who received the first dose of vitamin A [6].

have relatively weak access to health services, particularly in rural or hard-to-reach areas and among the poor (Table 1).

At this juncture, Indian states offering the measles SIAs have not planned to use the SIA platform to offer other interventions. A more comprehensive SIA design has the potential to increase efficiency and improve health service delivery to the underserved, but these considerations have never been formally assessed in this context. To understand the opportunities and challenges related to use of measles SIAs as a delivery platform for other child and maternal health interventions, we conducted a survey of stakeholders involved in India's current measles SIAs.

2. Methods

We administered a questionnaire to programme officers involved in delivery of India's measles SIAs. The questionnaire considered characteristics important for policy design, including disease burden, cost-effectiveness, feasibility, logistics, equity, affordability, and budget impact. Questionnaire options were based on studies concerning the benefits and risks of a broader SIA strategy [7,8], candidate add-on health interventions [2,7–9], and outcomes of interest to policymakers [10,11]. The survey asked exclusively about candidate health interventions currently offered in India through the public system. It included both structured and open response formats; questions are provided in Appendix A.

The survey targeted program officers responsible for SIA delivery in each of the 14 participating states. Respondents were contacted as follows: for each state, the national Deputy Commissioner Immunization, Universal Immunization Programme (UIP), Ministry of Health and Family Welfare (MHFW), New Delhi, linked us to the State Operations Group (SOG). The SOG is responsible for leading campaign planning and implementation at state level and includes a director from the state MHFW and the State Immunization Officer (SIO) [12]. SOG members generally requested members of the state catch-up campaign control room responsible for day-to-day planning, monitoring, coordination and implementation of activities (e.g. State EPI Officer (SEPIO), deputy director of routine immunization, cold chain specialist) to join in completing the survey. As the survey was done in fulfilment of professional responsibilities, officers could choose to respond individually or to provide a single response representing a consensus view. The questionnaire was administered by JKS via face-to-face interview in Hindi, Bengali and English between February 15th and March 29th, 2012. Informed consent was obtained, confidentiality assured, and data rendered anonymous prior to analysis. Research followed ethics guidelines of the Indian Council of Medical Research and the Helsinki Declaration [13].

Responses follow a scale of 1 (disagree) to 5 (strongly agree), or 0 (no) to 1 (yes). Descriptive statistics (median, range, proportion) were used to summarize the data. The unit of analysis was the state. Where multiple responses were provided per state, we pooled results taking the median score. Participants could decline to respond to the survey or to specific questions. These data were recorded as missing and excluded from calculations.

3. Results

3.1. Survey respondents

Officers from all 14 state immunization programmes participated in the survey; the response rate was 100%. The survey took an average of 2.5 (range 1.5–5) h to complete. Twenty-three questionnaires were received: 3 from Manipur, 2 each from Arunachal Pradesh, Assam, Jharkhand, Madhya Pradesh, Meghalaya, Tripura and Uttar Pradesh, and a single survey representing a consensus view from the remaining 6 states. Results summarize responses for all 14 states.

3.2. Benefits and risks of broadening the scope of the measles SIAs

On a scale of 1–5, respondents strongly supported the idea that measles SIAs could be used as a platform to deliver additional health interventions in India (median 5; range 2–5). Fig. 1 presents their assessment of potential benefits and risks. The two most important benefits were expanded outreach to those with limited access (median 4.5; range 1–5) and additional opportunities for human resource training (median 4.25; range 3–5). In terms of potential barriers, risks or unintended negative consequences, respondents cited management challenges (e.g. the need for new incentives, supervision systems, and monitoring and evaluation mechanisms), logistics (transportation, supply management, cold chain and storage), and safety as most important (median 4.0, range 1–5 for all).

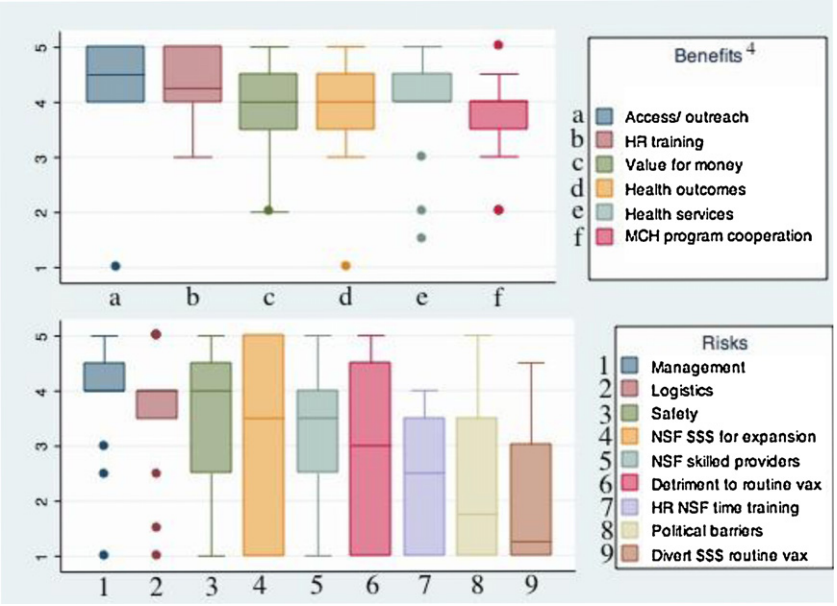

Fig. 1. Benefits and risks of a broader measles SIA strategy ($n = 14$). (1) Survey questions on benefits and risks are provided in Appendix A questions 2 and 3. (2) The *y*-axes show responses on a scale of 1 (disagree) to 5 (strongly agree). (3) These boxplots display five descriptive statistics: the median line (50th percentile), the box containing the middle 50% of responses (bounded by the 25th and 75th percentiles), and the ends of the whiskers (5th and 95th percentile). Outliers are indicated by dots. (4) Legends make use of the following abbreviations: human resources (HR); insufficient (NSF); maternal and child health (MCH); financial resources ($$$); vaccination (vax).

In keeping with UIP terminology, "safety" in this survey refers to programmatic errors (such as additional complexity leading to mistakes in communication, labelling, or by providers) and adverse events following delivery of vaccines or other interventions.

3.3. Criteria for selecting interventions to include as SIA add-ons

On a scale of 1–5, respondents ranked three characteristics as most important to consider in selecting interventions as SIA add-ons: targeting an important health problem as measured by the burden of disease (median 4.5, range 2–5), safety (median 4.5, range 3–5), and contribution to equity via benefit to currently underserved children (median 4.25, range 4–5). The remaining criteria (logistics, value for money, potential for multiple interventions to have greater health impact, affordability, equity via benefit to child's mother, and patient time required) were also considered important (median 4).

3.4. Candidate interventions for inclusion in future measles SIAs

Table 2 summarizes respondents' views on candidate health interventions for inclusion in future Indian measles SIAs. For children, simple interventions for nutrition, diarrhoea and parasites were most often chosen. The three most popular were nutritional screening, vitamin A supplementation, and free distribution of oral rehydration salts (ORS), followed by promotion of oral rehydration therapy (ORT) and deworming medicines. Vaccine-based interventions such as delivery of DTP catch up or booster, BCG and Japanese encephalitis were least often selected. For mothers, iron supplements, folic acid, and calcium supplements were most frequently selected.

3.5. Additional policy issues

The proportion of respondents identifying the following health and wider outcomes as of policy interest was: child mortality (1), child morbidity (0.96), child malnutrition (0.96), maternal mortality (0.89), maternal morbidity (0.89), household financial security (0.71), macroeconomic impact of investment in child health (0.71), child cognitive development (0.57), child future workforce participation (0.53). All respondents expressed interest in considering equity. They ranked the following equity dimensions as important: area of residence (urban/rural) (0.93), age of child at vaccination (0.86), household economic status (0.75). Respondents felt that an expanded SIA package should be tailored to the state (0.61) or district (0.39) level. None favoured a single package for the entire country.

Table 2
Health interventions recommended for inclusion in future measles SIAs ($n = 14$).

Intervention	Proportion of respondents selecting the interventions
Interventions for children	
Nutritional screening	0.82
Vitamin A supplementation	0.82
Free distribution ORS	0.82
Promotion ORT	0.75
Deworming	0.71
Nutritional supplementation[a]	0.61
Zinc supplementation	0.54
Free distribution ITN	0.50
HIV testing	0.39
OPV	0.29
Infant malaria treatment	0.25
BCG	0.25
DTP catch up/booster	0.25
JE	0.25
Interventions for mothers	
Iron supplements	0.82
Folic acid	0.71
Calcium supplements	0.68
Deworming	0.50
Family planning	0.43
Tetanus toxoid vaccine	0.43
Malaria treatment	0.21

BCG, Bacille Calmette–Guérin vaccine; DTP, diphtheria, tetanus and pertussis vaccine; ITN, insecticide-treated bed net; JE, Japanese encephalitis vaccine; OPV, oral polio vaccine; ORS, oral rehydration salts; ORT, oral rehydration therapy.

[a] In India, nutritional supplementation for children is generally given in the form of food staples.

4. Discussion

State programme officers involved in delivery of India's measles SIAs felt that integrating health services onto the immunization platform could be of great value in the Indian context. They viewed an expanded SIA as a potentially effective means to reinforce and extend the reach of health services, and thus as beneficial for attainment of national objectives such as the Millennium Development Goals. While conscious of the need for careful policy design [8] and consideration of health system issues [14] to ensure success of the strategy, respondents felt that the benefits exceeded the risks. These results cohere with a growing international trend to add interventions to the SIA platform [2,8,15].

Several studies have evaluated SIAs integrating other health interventions following implementation [16–19]. This study is unique in systematically surveying stakeholders at the SIA platform-planning phase. We successfully engaged with expert programme officers in all 14 Indian states conducting SIAs on platform design issues informed by the most recent literature. Several study limitations should be considered. (1) Respondents occupied state-level roles; members of the district task force closer to the realities of field implementation might have had different perceptions. While surveying a broader range of stakeholders is important for future work, state- and district-level responses may be relatively similar given that many state officers have district-level experience and, in smaller states, the state team includes district officers. (2) Individual and group responses were accepted; group responses could be dominated by the views of higher-level officers. However, in states with group interviews, it was the senior officer who invited lower-level staff to participate recognising that a team implements the SIA. (3) The survey used a standardized response scale rather than requiring participants to rank criteria and interventions explicitly. While potentially more informative, a ranking approach was felt to be more difficult for respondents. (4) The survey did not consider challenges related to monitoring and evaluating integrated campaigns, which may require modifications to sampling methods, survey designs, and tracking systems. (5) Some relevant add-on interventions such as water treatment and hygiene were not considered [20]. Despite these limitations, study results offer tentative directions for policy and research.

Add-on interventions recommended by respondents are generally offered through Government of India programmes. For these interventions, an adjunct SIA delivery strategy can be most useful where coverage levels lag overall or in specific subpopulations. There is considerable scope for impact in these 14 states (Table 1). The case of nutritional screening is unique. Levels of malnutrition in India remain extremely high; 40% of children under age three are underweight and 23% are wasted [21]. Solutions will require a multipronged approach including system strengthening [22]. Currently, community health workers are responsible for screening and referral of malnourished children to government programmes offering nutritional supplements, notably the Integrated Child Development Services (ICDS). However, implementation of the ICDS has failed to reach the most vulnerable groups, such as children under three, and socioeconomically disadvantaged households [23]. Adding nutritional screening to future follow-up SIAs would enable community sensitization, systematic identification of malnourished children from 9 months to 10 years of age, and effective linkage to programmes offering nutritional supplements such as ICDS [24]. This illustrates how SIAs can be leveraged to revitalise existing services and to improve child health outcomes [14,25].

Although respondents to our survey preferred simple interventions, more complex interventions including vaccines may hold greater promise of lasting health gains. To facilitate evidence-based design of SIAs in low- and middle-income countries, future research should develop policy models considering a wide range of criteria such as health impact, costs and cost-effectiveness, equity and feasibility. An appropriate analysis should reflect concerns important to policymakers while making use of local epidemiological and economic data. As an essential first step, stakeholder consultation can increase understanding of context and key drivers important to improving SIA design.

Author roles

MJ designed the study, analyzed the data and drafted the article. JKS conducted the interviews, and contributed to study design, interpretation of the data, and critical revision of the article for important intellectual content. M. Jit and SV contributed to study design, analysis and interpretation of the data, and critical revision of the article. All authors have approved the final version.

Role of the funding source

This study was funded by the World Health Organization (WHO)'s Initiative for Vaccine Research (IVR). The study sponsor played no role in study design; the collection, analysis, and interpretation of data; the writing of the report; or the decision to submit the paper for publication.

Conflict of interest

The authors declare that they have no conflicts of interest, financial or otherwise, in the conduct of this work.

Acknowledgements

This study could not have been completed without the support and guidance of Dr. Pradeep Haldar (Deputy Commissioner Immunization), Universal Immunization Program (UIP), Ministry of Health and Family Welfare, New Delhi, India. We would also like to thank the following individuals and organizations: Dr. Hema Gogia (UIP), Tony Burton, Alya Dabbagh, Rudi Eggers, Emily Simons, Peter Strebel (World Health Organization (WHO) Accelerated Disease Control Team (ADCT)); Kaushik Banerjee (WHO Department of Immunization, Vaccines and Biologicals (IVB)); Raymond Hutubessy (WHO Initiative for Vaccine Research (IVR)); Dr. Martha Roper (Independent Consultant); Cindy Gauvreau, Shaun Morris, Prabhat Jha (Centre for Global Health Research (CGHR) and the Disease Control Priorities Network (DCPN)); Bidyut Sarkar ((Public Health Foundation of India (PHFI)), Dean Jamison (DCPN) and Ramanan Laxminarayan (PHFI & DCPN). Four anonymous reviewers provided insightful comments that greatly strengthened the quality of this work. Our greatest debt is to the state immunization program officers who generously shared their time and expertise.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.vaccine.2012.09.044. These data include Google map of the most important areas described in this article.

References

[1] World Health Organization. Measles vaccines—WHO position paper. Weekly epidemiologic record, No. 35. 84th ed. Geneva: World Health Organization; 2009. pp. 349–60.
[2] World Health Organization. Progress in global measles control, 2000-2010. Weekly epidemiologic record, No. 5. 87th ed. Geneva: World Health Organization; 2012. pp. 45–52.

[3] van den Ent MM, Brown DW, Hoekstra EJ, Christie A, Cochi SL. Measles mortality reduction contributes substantially to reduction of all cause mortality among children less than five years of age, 1990–2008. J Infect Dis 2011;204(July (Suppl. 1)):S18–23.
[4] Bilous J, Eggers R, Gasse F, Jarrett S, Lydon P, Magan A, et al. A new global immunisation vision and strategy. Lancet 2006;367(9521):1464–6. May 6.
[5] Office of the Registrar General and Census Commissioner. Provisional population tables: India: census 2011. New Delhi: Government of India, Ministry of Home Affairs; 2012.
[6] Government of India Ministry of Health and Family Welfare. 2009 coverage evaluation survey. New Delhi: UNICEF India Country Office; 2010.
[7] Wallace A, Dietz V, Cairns KL. Integration of immunization services with other health interventions in the developing world: what works and why? Systematic literature review. Trop Med Int Health 2009;14(January (1)):11–9.
[8] Wallace AS, Ryman TK, Dietz V. Experiences integrating delivery of maternal and child health services with childhood immunization programs: systematic review update. J Infect Dis 2012;205(March (Suppl. 1)):S6–19.
[9] Doherty T, Chopra M, Tomlinson M, Oliphant N, Nsibande D, Mason J. Moving from vertical to integrated child health programmes: experiences from a multi-country assessment of the Child Health Days approach in Africa. Trop Med Int Health 2010;15(March (3)):296–305.
[10] Bärnighausen T, Bloom DE, Canning D, Friedman A, Levine OS, O'Brien J, et al. Rethinking the benefits and costs of childhood vaccination: the example of the Haemophilus influenzae type b vaccine. Vaccine 2011;29(13):2371–80. March 16.
[11] Baltussen R, Niessen L. Priority setting of health interventions: the need for multi-criteria decision analysis. Cost Eff Resour Alloc 2006;4:14.
[12] Government of India Ministry of Health and Family Welfare. Measles catch-up immunization campaign: guidelines for planning and implementation. New Delhi: Government of India Ministry of Health and Family Welfare; 2010.
[13] WMA declaration of Helsinki—ethical principles for medical research involving human subjects (2008 revision); 1964.
[14] Griffiths UK, Mounier-Jack S, Oliveira-Cruz V, Balabanova D, Hanvoravongchai P, Ongolo P. How can measles eradication strengthen health care systems? J Infect Dis 2011;204(July (Suppl. 1)):S78–81.
[15] Ropero-Alvarez AM, Kurtis HJ, Danovaro-Holliday MC, Ruiz-Matus C, Tambini G. Vaccination week in the Americas: an opportunity to integrate other health services with immunization. J Infect Dis 2012;205(March (Suppl. 1)):S120–5.
[16] Goodson JL, Kulkarni MA, Vanden Eng JL, Wannemuehler KA, Cotte AH, Desrochers RE, et al. Improved equity in measles vaccination from integrating insecticide-treated bednets in a vaccination campaign, Madagascar. Trop Med Int Health 2012;17(April (4)):430–7, http://dx.doi.org/10.1111/j.1365-3156.2011.02953.x.
[17] Kulkarni MA, Vanden Eng J, Desrochers RE, Cotte AH, Goodson JL, Johnston A, et al. Contribution of integrated campaign distribution of long-lasting insecticidal nets to coverage of target groups and total populations in malaria-endemic areas in Madagascar. Am J Trop Med Hyg 2010;82(March (3)):420–5.
[18] Grabowsky M, Farrell N, Hawley W, Chimumbwa J, Hoyer S, Wolkon A, et al. Integrating insecticide-treated bednets into a measles vaccination campaign achieves high, rapid and equitable coverage with direct and voucher-based methods. Trop Med Int Health 2005;10(November (11)):1151–60.
[19] Boselli G, Yajima A, Aratchige PE, Feldon KE, Xeuatvongsa A, Phounphenghak K, et al. Integration of deworming into an existing immunisation and vitamin A supplementation campaign is a highly effective approach to maximise health benefits with minimal cost in Lao PDR. Int Health 2011;3(December (4)):240–5, http://dx.doi.org/10.1016/jinhe201108002.
[20] Briere EC, Ryman TK, Cartwright E, Russo ET, Wannemuehler KA, Nygren BL, et al. Impact of integration of hygiene kit distribution with routine immunizations on infant vaccine coverage and water treatment and handwashing practices of Kenyan mothers. J Infect Dis 2012;205(March (Suppl. 1)):S56–64.
[21] Final report of the National Family Health Survey (NFHS-3), 2005–06. New Delhi: Government of India, Ministry of Health and Family Welfare; 2007.
[22] Planning Commission of India. High level expert group report on universal health coverage for India. New Delhi: Planning Commission of India; 2012.
[23] Gragnolati M, Shekar M, Das Gupta M, Bredenkamp C, Lee YK. India's undernourished children: a call for reform and action. Washington, DC: The World Bank; 2005.
[24] Swami HM, Thakur JS, Bhatia SP, Singh K, Bhan VK, Bhatia V. National immunization day to assess nutritional status of underfives in Chandigarh. Indian J Pediatr 2000;67(January (1)):15–7.
[25] Sepulveda J, Bustreo F, Tapia R, Rivera J, Lozano R, Olaiz G, et al. Improvement of child survival in Mexico: the diagonal approach. Lancet 2006;368(9551):2017–27. December 2.