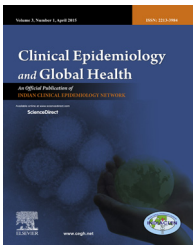
Available online at www.sciencedirect.com

ScienceDirect

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



Original Article

Maternal determinants of immunization status of children aged 12–23 months in urban slums of Varanasi, India

Ashish Awasthi [a], C.M. Pandey [b,*], Uttam Singh [a], Sarvesh Kumar [c], T.B. Singh [d]

[a] Department of Biostatistics & Health Informatics, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow 226014, India
[b] Professor and Head, Department of Biostatistics & Health Informatics, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow 226014, India
[c] Department of Obstetrics & Gynaecology, Sarojini Naidu Medical College, Agra 282002, India
[d] Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi 221005, India

ARTICLE INFO

Article history:
Received 2 June 2014
Accepted 24 July 2014
Available online 18 August 2014

Keywords:
Immunization
Maternal determinants
Dropout
Non-adherence

ABSTRACT

Problem considered: The risk of health problems from vaccine-preventable diseases is highest in those who experience barriers in accessing immunization services. These barriers could be cost, location, lack of awareness of immunization services and their health benefits or other limiting factors.

Material & methods: The present study was conducted to identify the determinants of complete immunization status among children aged 12–23 months in urban slums of Varanasi in India. A modified WHO EPI cluster sampling method has been used for sample selection. Data on 384 children were collected using pretested questionnaire through house to house visit. Chi-square test, bivariate and multivariate logistic regression were used to assess the factors associated with complete immunization status in the urban slums of Varanasi.

Results: Only 57.03% children have received the complete recommended immunization schedule under universal immunization program. Significant determinants of the complete immunization were maternal age (OR = 1.86, 95% CI 1.54–3.23), parity less than three (OR = 2.84, 95% CI 1.98–3.73), employment status of mother (OR = 1.39, 95% CI 1.21–2.63) and mother's education higher than secondary level (OR = 1.59, 95% CI 1.30–2.88).

Conclusion: More than half the way is complete to achieve the target of universal immunization against vaccine preventable diseases among children, but there is need to address the issue of dropout. Mother's education, low parity, maternal age and employment status

* *Corresponding author*. Tel.: +91 522 2494920.
E-mail addresses: cmpandey@sgpgi.ac.in, cmpandeylko@yahoo.com (C.M. Pandey).
http://dx.doi.org/10.1016/j.cegh.2014.07.004

of mothers are main factors associated with adherence of immunization schedule. It is necessary that interventions should be strengthened to minimize immunization dropout in the vulnerable children.

1. Introduction

Vaccination and immunization have been acknowledged as an effective preventive strategy for several communicable diseases.[1] An immunization campaign carried out by the World Health Organization (WHO) from 1967 to 1977 eradicated the natural occurrence of smallpox. Poliomyelitis is another disease which is going to be eradicated. Since the launch of Global Polio Eradication Initiative by WHO and its partners in 1988, worldwide number of cases of poliomyelitis has fallen by over 99%. In India, number of cases have dropped down from 0.2 million cases per year to 42 cases in year 2010 and polio eradication stage has been achieved during the year 2014.[2,3] During 1999–2003, deaths due to measles dropped worldwide by almost 40% and some regions have set a target of eliminating the disease.[2]

India launched Universal Immunization Program (UIP) with the objective to cover at least 85% of all infants by year 1990.[4] Further, a national socio-demographic goal was setup in National Population Policy (NPP 2000) to achieve universal immunization against all vaccine preventable diseases by year 2010.[5]

When India became independent sixty years ago, the country's population was a mere 350 million. Since 1947, the growth of population in India is more than threefold while urban population growth has been six folds.[6] Most of this urban growth is due to rural–urban migration leading to the creation of new slum areas. With the rapid growth of megacities, the risk of outbreak of vaccine preventable disease always exists due to high population density, continuous incursion of a new pool of infective agents with the immigrants and poor coverage of primary immunization in urban slums.[4,7,8] In many studies, it was shown that mother's knowledge of immunization and vaccination were significantly associated with full immunization.[9] It was reported in earlier studies that complete age appropriate vaccination was less than 50% in India, for BCG and OPV age appropriate vaccination was less than 80% and for DPT and Measles age appropriate vaccination was less than 60%.[10] This study was therefore conducted to identify maternal characteristics associated with immunization coverage among children aged 12–23 months in the urban slums of Varanasi, India.

2. Material and methods

Varanasi is one of the oldest living cities of India, having more than 200 slums in year 2008 as per records of Varanasi Municipal Corporation. A community based cross-sectional study design has been employed from January 2009 to March 2009 to establish immunization pattern and factors associated to non-adherence to immunization program. The study population consists of mothers of children aged 12–23 months at the time of survey conducted, who were residents of urban slums of the Varanasi.

To identify the determinants of non-adherence of immunization schedule for categorical variables with proportion of 50% children belongs to either category of possible non-adherence (independent) variable, it was assumed that the baseline probability was 0.6 and alternative probability was 0.8 with 95% power at $\alpha = 0.05$ for two tailed hypotheses, required number of children was 216, assuming a design effect of 1.5 and 10% non-response estimated number (216) was escalated to 357 children.[11,12] Design effect was calculated using the equation.

$$D_{eff} = 1 + (m - 1)\rho$$

where D_{eff}: Design effect; m: no of subjects in a cluster; ρ: intracluster correlation coefficient.

The sampling procedure of this study was based on the WHO thirty cluster methodology.[13] In the first phase, thirty urban slum areas of Varanasi were selected randomly from total 228 slums listed in municipal corporation list. In the second stage from each slum area minimum twelve children were included in the study. If in any household more than one child was present all children were included in the study. The first household in each cluster was selected by random walk method, and the rest of them were selected from the contiguous household till the required number of children was attained. Information was collected either from the mother of identified child or head of the household after obtaining a signed informed consent form.

3. Data collection

To obtain information on the socio-demographic characteristics of mothers, including the mother's knowledge about the immunization program and possible factors of non-compliance or partial immunization, we used a structured questionnaire after pretesting and validation. The universal immunization program in India includes one dose of BCG administered intradermally on the outer upper left arm or shoulder (over the deltoid muscle insertion) at birth, a single dose of measles given subcutaneously on the left upper arm at the age of 9 months, and three doses of DPT[1–3] given intramuscularly on the outer mid-thigh at 6, 10 and 14 weeks of ages respectively.