Proceeding of the 1st International Conference on Public Health, Vol. 1, 2015, pp. 76-80

ISSN: 2324 – 6735 online
DOI: 10.17501/ icoph 2015-1110

MEASLES IMMUNIZATION COVERAGE CONCERNING ELIMINATION SETTINGS IN RIVER NILE STATE 2014, SUDAN

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Abstract

Measles disease considered as one of the most serious childhood diseases worldwide, Sudan started measles elimination activities since 2004 .Therefore, remarkable progress noted in morbidity and mortality reduction of the disease. A descriptive cross sectional facility and community based study was carried out in Shandi and Almatama localities in River Nile state in Sudan through the period from November 2012 to February2015.This study aims to assess the ongoing activities concerning measles elimination including measles converges in routine program, supplementary immunization activities (SIAs). WHO standard of 30 clusters immunization survey sampling was applied for both localities to assess immunization coverage through examine the immunization status of 840 children. The study revealed that, measles's first dose coverage (MCV1) was (93.8% - 91.9%) in Shendi and Almatama localities, measles's second dose coverage (MCV2) was (84.8% - 86.2%) in Shendi-Almatama localities, the post measles SIAs survey coverage was (91.9% - 87.7 %) in shendi & Almatama localities comparing with (101% -98.7%) as administrative coverage. Moreover, educated mothers were more likely to have their children immunized than mothers who had no education and rural areas had the highest coverage rates compared with urban and slum areas. In conclusion ,the study recommended that, National immunization program should conduct a periodic immunization surveys especially in high risk groups To obtain high level of first and second doses of measles coverage as well as focus on improving the quality of supportive supervision.

Keywords: measles, immunization, elimination.

INTRODUCTION

Measles is a one of the most infectious and severe diseases of childhood and remains an important cause of morbidity and mortality in children in developing countries. In recent years, with the support of WHO and UNICEF, countries have accelerated their efforts to reduce measles morbidity and mortality both through increasing routine measles coverage and conducting periodic supplementary immunization activities (campaigns). In the period 2000–2007, these accelerated measles activities led to a 74% reduction in estimated global measles mortality (90% in the Eastern Mediterranean and 89% in the African regions). In addition, high coverage of two doses of measles vaccine (delivered through routine programs with or without supplementary campaign strategies) has virtually eliminated measles from the western hemisphere since November 2002.

The current goals in the six regions for measles are elimination in the regions of the Americas (AMR), Eastern Mediterranean (EMR), Europe (EUR) and Western Pacific (WPR) and, mortality reduction in AFR. Due to the success of the measles mortality reduction and elimination efforts thus far through the Measles Initiative and related WHO-UNICEF efforts, WHO has raised the question of feasibility of possible new goals such as the eradication of measles or further significant reductions in measles mortality [(1)].

The fourth Millennium Development Goal (MDG 4) aims to reduce the under-five mortality rate by two-thirds between 1990 and 2015. Recognizing the potential of measles vaccination to reduce child mortality, and given that measles vaccination

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coverage can be considered a marker of access to child health services, routine measles vaccination coverage has been selected as an indicator of progress towards achieving MDG 4 [(2)].

In Sudan, several measles outbreak were reported before introducing the vaccine in 1985, and measles was considered as one of the morbidity and mortality cause among under five years, after starting measles elimination strategies in 2004, dramatically decreasing of morbidity and mortality of measles cases were reported because of conducting SIAs and increasing in routine immunisation activities. During 2004, 2005 the number of cases were 10131, 1374, while only 228 cases were reported in 2006 (95% reduction from 2004) .Sudan also experienced several outbreaks in different regions because of accumulation of susceptible population [(7)].

MATERIAL AND METHODS

Study area

Shendi & Almatama localities are a part of River Nile state in North Sudan and they were one province in past, River Nile state bounded by Khartoum state to the south, northern state to the North, Gadarif state to the east and Kordufan state to the west .Shendi and Almatam localities are locating in the southern part of River Nile state they bounded by Aldamar locality to the North, Khartoum state to the South, Kassala state to the East and Northern Darfur state to the West .The total area of the tow localities is **76243** Km². The area of Shandi and Almatam localities divided to 347 catchment areas in EPI planning system including rural and urban site, each catchment area determined by borders and targets. The total estimated population is (454956) presented as (305931) for Shendi and (149025) for Almatam with total of (90991) households.

Sampling

WHO recommended 30-cluster EPI Coverage survey methodology was followed and adapted to assess immunization coverage in this study.

- Total numbers of 30 clusters were randomly selected from each locality to complete 60 clusters (30 clusters from Shendi & 30 clusters from Almatama)
- From each cluster we selected 7 children aged (12 – 23 month) for first and second measles doses and 7 children aged (9 month to 15 years) to examine the last supplementary immunisation activities campaign .
- Total converge of sentinel surveillance sites (12sites) were visited including priority (high, medium &low) and WHO adapted structural questionnaire were used.
- Two EPI head office and operation officers including the surveillance officer.
- All clinicians working in the 3 hospital in both localities were selected during the period of the study.

Subject	Sample size	Note
Child 12 -23 month	210 + 210 = 420 Shendi +Almatama	Total of 840 Children
Child 9month – <15 year	210 + 210 = 420 Shendi +Almatama	

Selection of the Clusters

The catchment areas (Blocks or villages) list was obtained as sampling frame in order to select the 30 clusters for each locality. Then random simple sample was applied to select the 30 cluster from each locality and reserve list was devolved to provide option in case of any missing in the cluster like inaccessibility or community rejections.

Selection of the Households (Sample Units)

- The first house visited in each cluster was selected at random using existing listings of household names, official maps; in case of the listing not available the map of the catchment area was used to determine the first house.
- Systematic random sample was applied for listed the households to select the 7 children for MV1 and 7 children for MV2. The sample interval was obtained

by divided the total numbers of households over the number of child intend to select etc:

$$\text{Sample interval} = \frac{\text{total numbers of households in the cluster}}{\text{7(number of sample unit)}}$$

- In areas where no listing for the households, the sketch map of the area was obtained and divided the catchment area into 4 sectors. Then, Random selection of one sector was applied, the data collectors stand at the centre of the sector and spin a bottle/pen and chosen the first house in the direction pointed as the starting point of the survey.
- The next or second household was selected by directing to right side and after count the number of sample interval.

$$\text{Second households} = \text{first household} + \text{sample interval}$$

Selection of Eligible Children (Sample Subjects)

Inclusion criteria

Any child aged between 12-23 month (for routine immunisation) and 9month - <15 years (for measles campaign) living in the study area and took his/her vaccine shot inside the study area.

Exclusion criteria

- Any child coming from outside the study area and took his /her vaccine shot from outside or partially vaccinated in study area.
- Any child has measles vaccine sensitivity disease or has reasons for not completing the course.
- Any eligible child hasn't got person to give information about vaccine status during the time of data collecting should be discarded .(caregiver should the mother, father or any other family members up to 18 years)

DATA COLLECTION AND ANALYSIS

Data was collected by using WHO adapted Structure questionnaires**.** Pretesting and Questionnaires validation was apply before the survey. Characteristics of households, mothers and all children aged 9 months through 15 years in each household included in the sample were collected. All data collected from the questionnaires were coded, checked and cleaned before entering, and analyzed by entering to computer using the statistical package for social science program (SPSS). The pilot study was conducted by distributing the questionnaire to the parents in (*kawthar hara*) at (shendi locality) prior to the main study. Tables and figures used to present the results. The WHO standards cut-off was used to compare the elimination performance indicators in addition to significant tests like chi-square test.

Ethical clearance for the study

The survey conducted in accordance with the national policies on ethics for surveys involving human subjects. The proposal was passed by the faculty of public health and faculty of post graduate in Shendi University. Then, the data collection started after taken consent from shendi locality health authority, Almatama locality and children caregiver.

RESULTS AND DISCUSSION

In the present study and according to the 30 cluster survey conducted in the study area, the measles's first dose coverage was (93.8% - 91.9%) with an Average of (92.8%) [CI 95%] in Shendi and Almatama localities respondents. This coverage represents the routine coverage for children below one year. The measles's second dose coverage for children aged 18-24 months was (84.8% - 86.2%) [CI 95%] in Shendi-Almatama localities .Additionally the reported coverage was (89.7%) from EPI 2013 report [(6)]. However, this average doesn't meet the WHO standard criteria to eliminate measles disease; there is still a large gap to achieve (95%) coverage. The left-out rate of MCV1 was considered as the key reason for measles prevalence in the younger age-group of (8 to 12 months). These results indicate the need to accelerate the improvement of the age-appropriate immunization rates for MCV1and MCV2. (Providing the first dose of measles vaccine to successive cohorts of infants 95% and Ensuring that all children have a second opportunity for measles vaccination95%) [(10)].

The post measles SIAs survey overage were (91.9% - 87.7 %) Average (89.8%) [CI 95%] in shendi & Almatama localities comparing with (101% -98.7%)

Average (99.8%) as administrative coverage , and this is reflects a poor quality of SIAs performance considering the importance of achieving high SIAs performance to increase the cohort immunity by decreasing the numbers of susceptible children with providing the second measles dose opportunity as well as the second doses of routine immunization (A second dose of measles vaccine, available through good quality supplemental immunization that reduces the proportion of susceptibility in a given population quite rapidly, this prevents measles outbreaks in the context of high routine immunization coverage, which further can help to eliminate indigenous measles transmission) [(62)].

Although the reported coverage is high, the study also showed poor immunization cards record keeping available for performance among respondents (15.2% - 20.5%) [Average 17.9%] in shendi & Almatama localities .The reasons behind unavailability were : lose through carelessness by the holders (lost) (52%) and (12%) had never been received an immunization cards for their child , consequently this decreases the opportunity of tracking immunization status among the target children in case of outbreak, immunization survey for elimination purpose or even travelling .The health workers in immunization site need to focus on the importance of keeping immunization cards in safe places (An immunization card keeps track of the immunizations**.** It is very important the cards should be kept in a safe place. Immunization records may be required for school, work, or travel. They may be needed if an outbreak occurs to provide proof of protection) [(63)]and this is in agreement with the study done in Yemen and it showed poor performance regarding availability of immunization cards [(8)].

Educated mothers were more likely to have their children immunized than mothers who had no education. Mothers with secondary and higher education had a great chance for full immunization than more than half of the illiterate respondents who had unvaccinated children (Table 35) and this is in line with study carried out in southeast Asian [(68)],.and study conducted in Tanzania which found that (a child whose mother had completed primary or had not attended school was three times more likely to have a low uptake than a child whose caretaker had completed secondary school) [(9)].

Substantial differences in vaccination status rates were found for children in urban and rural areas. Rural areas had the highest coverage rates compared with urban and slum areas. This is probably partly due to the general distribution of immunisation services strategy because they depend on mobile team in rural area and that may boost access opportunity and diminish dropout rate, this result disagrees with previous study done in Sudan and found that (Mothers of children from urban areas reported correct vaccination more than mothers of children in rural areas) [(10)] and also dissimilar with another study accomplish in Uganda and found that (58% of children in urban areas were fully immunized compared to 53% of children in rural areas.) [(11)].

RECOMMENDATIONS

National immunization program should conduct a periodic immunization surveys especially in high risk groups To obtain high level for first dose of measles coverage vaccine for children between (9month -18 month) on the way to elevate the immunity level and decrease the numbers of susceptibility among targeting groups, National immunization program, as well as intensive health education required to reduce the drop- out rate and defaulters .

ACKNOWLEDGMENT

We would like to acknowledge the immunization program staff in shendi and Almatam localities for their kind support and contribution in this work, Also many thanks and appreciation to professor Abdel Ghaffar Ali Adam and Dr. Omar Yousof .

REFERENCES

1. CDC, center of diseases control and prevention. Morbidity and Mortality Weekly Report MMWR. Atlanta : U.S Department of human and health services , July 5, 2013.

2. http://www.who.int/mediacentre/factsheets/fs286/en/. World Health Orginisation . [Online] WHO, 4 July 2013.

3.Orginisation, World Health. immunization/newsroom/measles_rubella_wha_elimination_goals_statement_may12/en/. http://www.who.int. [Online] World Health orginisation , sunday June 2014.

4. Intiative, Measles Elemination. Measeles Initiative . Atlanta : WHO,CDC,UNICF, 2014. 1.

5. Prevention, Centers for Disease Control and. Progress Toward Measles Elimination --- European Region, 2005--2008. 1600 Clifton Rd, MailStop E-90, Atlanta, GA 30333,

U.S.A : Morbidity and Mortality Weekly Report ,Centers for Disease Control and Prevention, 2010.

6. Global Measles Elimination Efforts: The Significance of Measles Elimination in the United States. Peter M. Strebel, 1 Ana-Maria Henao-Restrepo,3. New York, : Significance of US,Infectious Diseases Society of America, 2004. S257.

7. FMOH, Fedral ministry of Health. Manual of Measlse SIAs Manegment. Khartoum : EPI,Expanded Program of Immunisation in Sudan, 2013. 12,13.

8. Assessment of the Status of Measles Elimination from Reported Outbreaks: United States, 1997–1999. Nigel J. Gay, 1 Gaston De Serres,. JID 2004:189 (Suppl 1), Atlanta : The Journal of Infectious Diseases, 2004, Vols. 2004; 189(Suppl 1):S36–42.

9. WHO. Progress towards measles elimination – Eastern Mediterranean Region,2008–2012. Geneva : World Health orginisation , 13 JUNE 2014. No. 24, 2014, 89, 257–264.

10. Dalya Guris, MD, MPH,National Immunization Program-CDC. Module on best practices in measels survellance. Geneva : world health orginisation, 2001.

11. Ann Levin1, Colleen Burgess2,. Economic Evaluation of Measles Eradication Study: Results for Six Countries and by Income Groups. s.l. : world health orginisation , August 17, 2010.