

# Evaluation of Measles Vaccination Program in Diyala Governorate

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**Abstract:**

**Background:** Vaccination remains the main cause of the marked reduction in vaccination-preventable diseases that were prevalent and often fatal, so vaccination remains the most cost-effective preventive intervention at present. Measles is still a cause of childhood diseases and deaths despite the availability of an effective and safe vaccine.

**Objectives:** To assess the extent of implementation of the measles vaccination program to know which areas are achieving a good or poor evaluation of everything related to the implementation of measles vaccination programs in health care centers in Diyala Governorate.

**Materials and Methods:** descriptive, cross-sectional study conducted at 40% not Random samples (non-probability) quota sample (Designation) selected health facilities in Diyala governorate, The data collection was made by WHO- UNICEF standardized questionnaire / indicators for Evaluation Expanded Programme on Immunization The data collection started from February - 2021 till end of April 8 -2021.

**Result:** The overall scores of this assessment main domains concerning (Health Facility Based Implementation) questionnaire, "Percent Grand Relative Sufficiency-PGRS%", as well as evaluation grades adopting to indicates the levels of implementation of the system in the studied questionnaire related with the studied protocol for assessment of measles vaccination on the studied "PHCCs", which included of eleven main domains. Performance levels of (Training and Document/data Optional section if time allows: observation of vaccine) were between about 98.29% and 93.0% while(Monitoring and Supervision and Vaccine wastage and Health care worker knowledge and Waste disposal) were 100% levels(Vaccine coverage and Observations) were between 89.14% and 81.14% while (Administration and Documentation and Advocacy, communication) 76.0%and75.0% while (Adverse events following immunization) were Pass about 51.43% while (Vaccine and cold chain) were Poor about 31.0%.

**Conclusions:** According to the Percent Grand Relative Sufficiency-PGRS% "Results shows that studied items subjected to evaluation according to a proposed scoring scales were distributed generally at the middle to high levels, since two scales ( $\geq 50\%$ , and All) regard to all domains Except The degree of evaluation of the measles vaccination program was "< 50%" weak/poor in most items with regard vaccine and cold chain management.

## Introduction:

Measles remains a significant cause of childhood morbidity and mortality in humans. measles is acute viral illness ,that ahighly contagious that can lead to serious life-threatening complications and death(De Vries *et al*, 2015).Remains Childhood immunization one of the highest impact public health interventions, to reduc infectious diseases-related morbidity and mortality of children at a low cost . It is a core child survival Immunization is a protective measure against infectious diseases strategy and is demonstrated to avert more than 1•2 million child deaths each year, (Bangura *et al*,2020).In 1974, only about five percent of the world's children had access to vaccines World Health Organization (WHO) established the Expanded Program on immunization (EPI) in the early 1980s to provide six vaccines The six vaccines of the Expanded Programme of Immunization protect against polio, tuberculosis, tetanus, diphtheria, pertussis, and measles to 80 percent of children worldwide. Thanks to this effort immunization saves more than three million live seach year—about ten thousand lives a day and protects millions more from illness and permanent disability(Kane& Lasher, 2002). Measles vaccines". a live attenuated vaccines are available worldwide, for as single-virus vaccines or in combination with other vaccine viruses (commonly rubella and mumps). In 1963, the live attenuated MCV (Edmonston B strain) became licensed in the United States vaccines measles were derived currently used from the Edmonston. strain of the measles virus (MV) isolated by Enders and Peebles in 1954 These vaccines have undergone different passage histories in cell culture, measles vaccine induces both humoral and cellular immune responses. Antibodies first appear between 12 and 15 days after vaccination and peak at 21 to 28 days ( Moss& Griffin *et al*, 2006). In Iraq Expanded Program on Immunization (EPI) started in 1985 which support the immunization services , it has strength points as it has good surveillance system and integration between authorities as well as coordination with WHO (Abd *et al*,2019). Reaching all children with 2 doses of measles-containing vaccine (MCV) should be the standard for all national immunization programmes. Countries aiming at measles elimination should achieve 95% coverage with both doses equitably to all children in every district. In addition to the first routine dose of (MCV1), all countries should include a second routine dose of (MCV2) in their

national vaccination schedules regardless of the level of MCV1 coverage; second routine dose of MCV in the second year of life the lessen accumulation of susceptible children by immunizing those who did not respond to MCV1 or did not receive the first dose. This measure has the further advantages of lengthening the period between campaigns, helping to establish a routine well-child visit during the second year of life (WHO,2019).

### Objectives of study:

To assess the extent of implementation of the measles vaccination program in terms of training, monitoring and supervision, vaccine waste, knowledge of health care workers, waste disposal, data documentation, vaccine coverage, management, documentation and other areas, To know which areas are achieving a good or poor evaluation of everything related to the implementation of measles vaccination programs in health care centers in Diyala Governorate.

### Materials and methods:

This study is a descriptive, cross-sectional study conducted at 40% not Random samples (non-probability) quota sample (Designation) selected health facilities in Diyala governorate. The data collection from all places of study started from February -2021 till end of April 8 -2021.The data collection was made by WHO- UNICEF standardized questionnaire / indicators for Evaluation Expanded Programme on Immunization of. The WHO has prepared a user-friendly tool for assessing implementation MCV1; MCV2. which includes questionnaires and checklists that countries can adapt assessment tool consists of many questions, many of which are divided into sub-questions (AppendixA ) modified by supervisor and researcher and validated by 9 experts. This questionnaires checklist represented the evaluation of Measles Vaccination Program immunization programme in primary health care centers .

### Statistical Analysis:

statistical data analysis approaches were used in order to analyze and assess the results of the study under application of the statistical package (SPSS) ver. (21) (Tables) (Frequencies, Percents, and Cumulative percents).

a- Summary Statistics tables including: Percent Mean of score (MS), Percent Grand /or Global Mean of Score, (PGMS) Mean of Score, Standard Deviation (SD), Pooled Standard Deviation (PSD), Percent Relative Sufficiency (PRS%), and Percent Grand/or Global Relative Sufficiency (PGRS%), as well as minimum, maximum responses, and the Range value of studied main domain's resending. Where Relative Sufficiency (RS%) are calculated by:

b-

$$RS \% = \frac{\text{Mean of Score}}{\text{no. of Scoring Scales}} * 100\%.$$

c- Graphical presentation by using :

- Bar Chart.
- Line Chart.

Reliability Coefficient for the Pilot study through using Al-Naqeeb Formula

$$\text{Reliability value} = \left( 1 - \frac{\text{no. of non coincidences items}}{\text{no. of all items} * \text{sample size of pilot study}} \right) * 100\%$$

### Results

The current study showed evaluation grades adopting to indicates the levels of implementation of the system in the studied questionnaire related with the studied protocol for assessment of routine measles vaccination on the studied "PHCCs", which included of eleven main domains. Table (1) shows a summary statistics of studied main domains concerning (Health Facility Based Implementation) questionnaire, such that "Percent Grand Mean of Score-PGMS, Pooled Standard Deviation-PSD, Percent Grand Relative Sufficiency-PGRS%". Showed that most of the main domains are resting on pass level of evaluation on degree of "≥ 50%", Training,Vaccinecoverage,AdministrationandDocumentation,Advocacy,communication,Obser



ations, Optional section if time allows: observation of vaccine, Document/data, and on good level of evaluation on degree of "All", Monitoring and Supervision, Vaccine wastage, Health care worker knowledge, Waste disposal, except of "Vaccine and cold chain" domain, which were recorded poor evaluation on degree of "< 50%".

Table (2) represented the distribution of a proposed scored for evaluation with percentages distributed among main domains of health facility, Results shows that studied items subjected to evaluation according to a proposed scoring scales were distributed generally at the middle to high levels, since two scales ( $\geq 50\%$ , and All) levels of evaluation are accounted (92.09%) of the studied items of having scored (Pass, and All), as well as items has scoring poor are accounted (7.91%) only. In addition to that highly relationship are accounted due to constraint distribution of different protocol main domains and different scoring scales evaluation regarding proposed scoring scales at  $P < 0.01$ .

**Table (1):**

Summary statistics of Health Facility Based Implementation Questionnaire concerning Main Domains Evaluation for the studied PHCC's

Main Domains	No. PHCC	Min.	Max.	PGMS	PSD	PGRS%	Ev.
Training	35	0.400	1.000	0.983	0.101	98.29	Pass
Monitoring and Supervision	35	1.000	1.000	1.000	0.000	100	All
Vaccine coverage	35	0.690	1.000	0.891	0.067	89.14	Pass
Vaccine wastage	35	1.000	1.000	1.000	0.000	100	All
Administration and Documentation	35	0.720	0.790	0.760	0.022	76.0	Pass
Health care worker knowledge: Ask HCW, not head of health	35	1.000	1.000	1.000	0.000	100	All
Vaccine and cold chain	35	0.310	0.310	0.310	0.000	31.0	Poor
Adverse events following immunization	35	0.500	1.000	0.514	0.085	51.43	Pass
Advocacy, communication	35	0.750	0.750	0.750	0.000	75.0	Pass
Observations	35	0.780	0.830	0.811	0.025	81.14	Pass
Waste disposal	35	1.000	1.000	1.000	0.000	100	All
Optional section if time allows: observation of vaccine	35	0.930	0.930	0.930	0.000	93.0	Pass
Document/data	35	0.920	1.000	0.970	0.039	97.03	Pass
Overall Evaluation	35	0.78	0.89	0.8409	0.015	84.09	Pass

**Estimated coverage:** (None, < 0.50,  $\geq 0.50$ , All) Represented by (Weak, Poor, Pass, Good) respectively.

## Discussion:

This study was conducted to evaluate of measles vaccination program in diyala governorate, launched for improving the vaccine program system. It is an innovation that focuses on Strengthening routine immunization is critical as it is the foundation to achieving and sustaining high levels of population immunity to measles. For measles elimination, vaccination coverage needs to reach and remain at or exceed 95% with each of the two doses of MCV vaccines at the district and national levels. The current study showed are most PHCCs The performance of the Training" main domain's criteria for the 5 points assessed in the present study was 98.29% from PHCs of study's centers had a The current result satisfactory for Are health facility staff training for the measles vaccine introduction and Did the person from this health facility who was trained train

others in the health facility

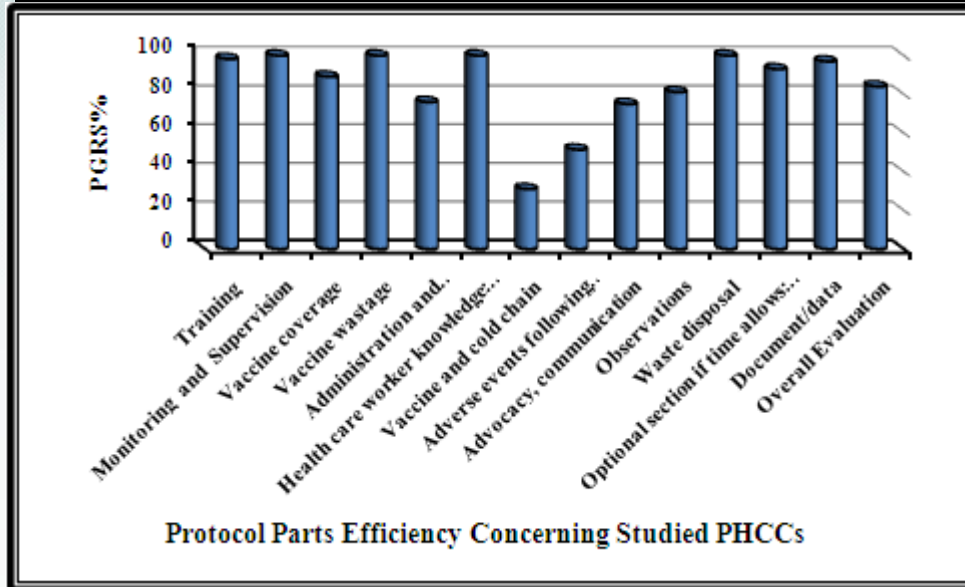
**Table (2):**

Distribution of proposed evaluating regarding routine second dose measles vaccination (Health Facility Based Implementation) for main domains of studied "PHCC's

Main Domains	No. & %	Proposed Scoring Scales				Total	C.S. P-value
		None (Weak)	< 50% (Poor)	≥ 50% (Pass)	All (Good)		
Training	No. %	-	1 2.8%	-	34 17.2%	35 7.7%	CC=0.807 P=0.001
Monitoring and Supervision	No. %	-	-	-	35 17.7%	35 7.7%	HS
Vaccine Coverage	No. %	-	-	34 15.4%	1 0.5%	35 7.7%	
Vaccine Wastage	No. %	-	-	-	35 17.7%	35 7.7%	
Administration and Documentation	No. %	-	-	35 15.8%	-	35 7.7%	
Health Care Worker Knowledge: Ask HCW, not head of health facility	No. %	-	-	-	35 17.7%	35 7.7%	
Vaccine and cold chain management, storage & logistic	No. %	-	35 97.2%	-	-	35 7.7%	
Adverse events following immunization	No. %	-	-	34 15.4%	1 0.5%	35 7.7%	
Advocacy, Communication & Acceptance	No. %	-	-	35 15.8%	-	35 7.7%	
Observations	No. %	-	-	35 15.8%	-	35 7.7%	
Waste Disposal	No. %	-	-	-	35 17.7%	35 7.7%	
Optional section if time allows: Observation of Vaccine Storage Area	No. %	-	-	35 15.8%	-	35 7.7%	
Document/data	No. %	-	-	13 5.9%	22 11.1%	35 7.7%	
Overall Evaluation	No. %	-	36 100%	221 100%	198 100%	455 100%	

These results may be attributed to the continuous training and follow-up by the sectors for the health staff assigned to the immunization unit These results agrees with the results show of the study in Southern Nigeria and in kalasin,thailand and ,in WHO Africa Region Burundi, (Ogboghodo *etal*, 2017;Widsanugorn *etal*,2011;Masresha *etal*,2018). which showed that the a good performance, had the training course on vaccine practices, The results in the current study are different with study in Ethiopia found training (45.2%)only. (Mohammed *etal*,2021)

Figure (1) illustrated bar chart plot of grand mean of score for studied main domains concerning routine second dose measles vaccination on the studied "PHCC's.



**Figure (1):** Bar chart plot of Percentile Grand Relative Sufficiency concerning measles vaccination on the studied PHCC's

Monitoring and Supervision, the important Monitoring to understand weaknesses and supportive supervision of all health functionaries is required to reinforce training and improve quality of immunization services. Monitoring and Supervision an opportunity to discuss their difficulties, to learn and to improve data analysis skills In the present study was found that high scores indicators the supervisory visits The current result showed satisfactory These results agrees with the results acceptable scores show of the study in jamnagar 2013 and in deTimóteo Mavimbe & Bjune.(Sanghavi,2013; de Timóteo Mavimbe& Bjune,2007). While However it differs from study in Ethiopia, Gujarat 2008 in Anand district. (Mohammed $etal$ ,2021; Patel  $etal$ ,2011). Vaccine Coverage, The results of this study indicated (89.14%). The current study shows coverage against measles and of Knowledge health care worker having Correct age of administration dose measles immunization and use coverage wall charts to monitor coverage and drop out levels . This result agrees with another study done in Cear , Brazil, Anand district of Gujara., JAMNAGAR , South Africa . (Moura,2018; Patel  $etal$ ,2011; Sanghavi  $etal$ ,2013, Swarnkar  $etal$ 2016), This result disagrees with the finding study done in Jhalawar, (Wallace $etal$ ,2018), to monitor coverage and drop out levels. Vaccine wastage, the results of this study indicated that all PHCCs (100%) is complete for calculate wastage management strategies were improved organization of outreach vaccination sessions, the majority of providers had accurate knowledge and correct practices regarding vaccine management and usage techniques related to vaccine wastage, These results agreed with the findings similar study was done in Cambodia's. (Wallace  $etal$ ,2017), These results disagreed with the findings similar study was done in Nigeria. (Wallace  $etal$ ,2018),The results of this study The main reasons that providers reported for vaccine wastage were discarding measles countin vaccine six hours after reconstitution ,These results agreed with the findings was done in Cambodia's , and in Jhalawar, Rajasthan (Wallace  $etal$ ,2017; Wallace  $etal$ ,2018),These results disagreed with the findings similar study was done in Nigeria.(Widsanugorn  $etal$ ,2011).Administration and Documentation Most important Pass indicators the staffs maintain a logbook for beneficiaries for immunization and if any of the children have missed their dose, public health stafe will make a note and during their home visits, they will remind and motivate them to get immunized. This study showed that Pass evaluation criteria administration and documentation measles vaccine. This result is agreement with published study in Jhalawar, Rajasthan, kalasin,thailand,andinlraq. (Wallace  $etal$ ,2018; Widsanugorn  $etal$ ,2011; Amily& Lami 2018). Observation of Vaccine and Storage. The current study shows that Pass evaluation , aboute measles vaccine is reconstituted correctly and other vaccines in sessions immunization ,This result was in agreement of the previous study done in Anand district of Gujarat, India. (Patel  $etal$ ,2011;Das  $etal$ ,2018),This result disagrees in kalasin,thailand.8 this study indicated that all PHCCs (100%) refrigerators properly functioning Correct storage of vaccine temperature +2 C to +8 C .This result is in agrees with the finding study done in Anand district of Gujarat. ,east Gojam zone of Amhara regioa ,Jamnagar.( Patel  $etal$ ,2011; Bogale  $etal$ ,2019;Sanghavi, 2013).

## Conclusions:

According to the Percent Grand Relative Sufficiency-PGRS% "Results shows that studied items subjected to evaluation according to a proposed scoring scales were distributed generally at the middle to high levels, since two scales ( $\geq 50\%$ , and All) regard to all domains Except The degree of evaluation of the measles vaccination program was "< 50%" weak/poor in most items with regard vaccine and cold chain management.

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