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COMPARATIVE STUDY OF ROUTINE VACCINATION COVERAGE OF CHILDREN LESS THAN 2 YEARS OF AGE IN LADY HEALTH WORKERS COVERED AND UNCOVERED AREAS IN SOUTH PUNJAB, PAKISTAN

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Abstract:
The EPI structure of Pakistan is administratively union council base. Vaccinator is responsible for vaccination services in each union council. LHWs are supposed to support vaccinators in their own registered communities for vaccination activities in the field. Lady health workers have several important duties to perform but vaccinating infants against childhood communicable diseases is one of the most cost-effective public health interventions. Each union council is partially covered with LHWs. There are some areas in South Punjab where routine EPI coverage is below benchmark. The main aim of the study is to measure the performance and effectiveness of LHWs in their own communities for the vaccination of under 2 years old children. Vaccine-preventable diseases incidences are high in South Punjab. Socioeconomic status and literacy rate of population is poor in South Punjab as compared to North and Central Punjab. South Punjab is highly polio-endemic region. The incidence of measles and NNT cases are high in South Punjab. Poliovirus circulation was detected in human in District Lodhran and environmental samples in District Multan. The mortality rate is high due to poor vaccination for measles.
The benchmark coverage is 80% for all the antigen of RI vaccination. Overall in Multan Division, fully immunized coverage (12-23 month that is BCG-Measles 1) is 84% in lady health worker covered areas and 76% in lady health worker uncovered areas. Statistical analysis portrays that standard deviation of fully immunized children is quite low in LHWs uncovered areas. Measles 1 and measles 2 coverage are suboptimal in LHWs uncovered areas. Community AEFI awareness is relatively better in LHWs uncovered areas as compared LHWs covered areas. Routine immunization coverage and quality are better in LHWs covered areas. Community AEFI awareness is not up to the mark in LHWs covered areas. Community participation is suboptimal in LHWs covered areas. Their role is well visible to boost up routine immunization at union council levels in each District. There is a need to extend LHWs support in uncovered areas.

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INTRODUCTION:

Lady health worker's concepts (LHW) originated from the "Barefoot doctors" of Mao Tse Tung of China. Hundreds of rural peasants were delivered basic training and were assigned medical and sanitation duties. Following the development of the program, the declaration of Alma Ata in September 1978 declared health as a basic human right. World Health Organization (WHO) and UNICEF convened a special conference on Primary Health Care (PHC) at Alma Ata (USSR). As a result, in 1980s PHC approach was seen as a mass production activity for training community health workers in several developing countries, including vaccinators, CDC, Sanitary Inspectors and local health workers. Pakistan had poor health indicators in terms of maternal and child health, between the 1970s and 1980s. There was a suboptimal communication between the communities and the health system. Moreover, despite inadequate resources, a major financial chunk was being spent on tertiary care thus neglecting primary health care and the rural population. Consequent to the above facts and being a signatory member to Alma Ata declaration, Government of Pakistan with the support of WHO and UNICEF also showed its commitment by launching a community health workers program known as the "National Program for Family Planning and Primary Health Care (FP&PHC)" in 1994. The Program popularly known as "Lady Health Workers Program" (LHWP), has been able to muster community participation through the creation of awareness and bringing about changes in attitude of the community regarding basic issues of health and family planning by establishing a comprehensive grassroots level effective system for provision of primary health care services.

Lady health workers have several important duties to perform but vaccinating infants against childhood communicable diseases is one of the most cost-effective public health interventions. Pakistan has the largest community health worker program in the world that includes more than a 1,00,000 LHWs. According to the World Health Organization (WHO), the past decade was supposed to be "a decade of vaccines. WHO efforts have reduced the global burden of under-five children deaths from 12 million to 6.6 million. Pakistan ranked 26th internationally for under-five mortalities, that is an under-five mortality rate of 86 per thousand live births. Furthermore, Pakistan has a neonatal mortality rate of 42 per thousand live births, and an infant mortality rate of 76 per thousand live births. In response to this local community health need, WHO also introduced the Expanded Program of Immunization to address the leading cause of these mortalities, vaccine-preventable diseases, and to ultimately achieve the Millennium Development Goal 4 (reduce child mortality) and currently SDGs 3. Potential causes include lack of community awareness and participation, inaccessibility of health facilities, and social problems. To tackle these entire ailments, the government of Pakistan launched the Lady Health Workers program in conservative rural and under-developed communities. (57, 58).

EPI stands for Expanded Program of Immunization. In 1974, the World Health Organization (WHO) launched the Expanded Program on Immunization (EPI) to ensure that all children have access to recommended vaccines. So that vaccine-preventable diseases can be eliminated. Initially, those vaccines were bacille-Calmette-Guérin vaccine (BCG), diphtheria-tetanus-pertussis vaccine (DTP), oral poliovirus vaccine, IPV, Rota vaccine and measles-containing vaccine (MCV). Global coverage of the third dose of DTP (DTP3) increased from <5% in 1974 to 79% by 2005. (1, 2)

EPI Schedule in Pakistan

PENTA comprised of five antigens that are Diphtheria, Pertussis, Hepatitis B, Tetanus, Hib

BCG and OPV zero—at the birth of a child

PENTA 1/PCV10 1/OPV 1/Rota ---at 6th week of life

PENTA 2/PCV10 2/OPV 2/Rota ---at the 10th week of life

PENTA 3/PCV10 3/OPV 3/IPV ---at the 14th week of life

Measles 1---after 9 months of birth

Measles 2---after 15 months of birth

DPT -----4 years

Milestones achieved in EPI*:* In 1976, EPI started as a pilot project after successful smallpox eradication.1978: EPI extended nationwide established.1981: Intensified activities started after EPI became a part of the Accelerated Health Program. 2002: Hep B vaccine introduced in the routine childhood immunization schedule of Pakistan. Auto-disable (AD) syringe was introduced in EPI in 2002. 2005: National EPI Policy formulated. 2006: Tetravalent vaccine (DPT-HepB) introduced in policy. 2009: Measles 2nd dose introduced in the routine childhood immunization schedule initiated. Hib vaccine introduced as a pentavalent vaccine (DPT-Hep B-Hib) in the routine childhood immunization schedule of Pakistan. Case-based measles surveillance including integrated Vaccine-Preventable Diseases (VPD) surveillance system introduced in 2009. 2012: Pneumococcal vaccine (PCV10) introduced in the routine childhood immunization schedule of Pakistan. 2015: Inactive

Polio vaccine introduced in Pakistan 2016: Rota vaccine launched in Pakistan. Strategies for vaccination in Pakistan:

FIXED CENTER: all public sector and important private sector health facilities. Provide service to the community within 3 km from the center/health facility. Daily: OPV, Penta, PCV10 and TT vaccines. The frequency of providing BCG and Measles depends on daily average client turn-out of the districts.

OUTREACH: provide service to the community more than 3 km from the center/ health facilities. At least one vaccination session is required in every community every month.
Temporary vaccination centers are established in a prominent and easily accessible place in the community e.g. Hujra, school, Health House etc.

MOBILE: Services are provided for the scattered population. At least 4 contacts are planned in every year. District areas are divided into union councils for an administrative point of view. Each union comprised of many villages. Vaccinators are deployed in each union councils for vaccination of children under 16 months irrespective of their geographical areas and population. Each union councils have a population about from 20000-50000 Vaccinators have to cover whole union councils in a month according to their tour plans. Lady health workers are deployed in each union council to look after primary health care components including routine vaccination of children in their children. They are different in number in different union council. They have a direct liaison with local communities. Each lady health worker has to take care of 1000-1500 population in their catchment areas. Lady health worker presence is extra support for vaccinator to complete his vaccination task in the union council. Vaccinator is solely responsible for vaccination of children in the union council. Lady health worker responsibility is to support vaccinators in the immunization of children in their respective areas and Vaccination of children except for measles and BCG in some areas, making due and defaulter list, maintain vaccination Dairy, registration of newborn, community mobilization, refer defaulter children to health facility and vaccination points, community advocacy, record zero-dose children during polio campaign, facilitate vaccinator in planning and vaccination post.

Vaccinators have to cover whole union councils in a month according to their tour plans. Lady health workers are deployed in each union council to look after primary health care components including routine vaccination of children in their children. They are variable in number in different union council. They have a direct liaison with local communities. Each lady health worker has to take care of 1000-1500 population in their catchment areas. Lady health worker presence is extra support for vaccinator to complete his vaccination task in the union council. Lady health worker responsibility is to support vaccinators in the immunization of children in their respective areas and vaccinator is solely responsible for the vaccination of children in the union council.

STATEMENT OF PROBLEMS

Is there any difference in routine vaccination coverage among target children between lady health workers covered and uncovered areas in South Punjab? Are they beneficial to improve routine vaccination coverage in their catchment areas in South Punjab, Pakistan?

RESEARCH QUESTION

1. Routine Immunization coverage is not meeting the target to achieve > 80% coverage in each union council.
2. Routine EPI coverage is not uniformly up to the benchmark in all areas of union council.
3. Polio, measles, diphtheria and neonatal cases incidences are higher due to poor immunization coverage in Districts.
4. Pakistan is still among polio-endemic countries.

OBJECTIVES OF STUDY

1. To compare routine immunization coverage in LHWs covered and uncovered areas.
2. To study LHWs role in routine immunization activities at union councils. level
3. To assess the immunization quality of work in LHWs covered and uncovered areas
4. To study LHWs role in enhancing community participation in vaccination activities

RESEARCH METHODOLOGY

Both structured and unstructured approach is applied to collect qualitative and quantitative data, as data is collected on the predesigned data sheet comprised of different variables, Independent variables, and dependent variables. Qualitative and quantitative comparative retrospective study design is used to complete research study regarding routine immunization coverage in LHWs covered and uncovered areas. The qualitative and quantitative approach is followed to collect and compile data. The

ground theory is considered in research. Data is collected by union council polio officers of WHO staff. EPI directorate pre-designed data collection survey form is used. Union councils are selected randomly in regional office Multan by a representative of the health department. The study is done in four districts of southern Punjab. Districts are selected through convenient sampling. Random sampling was done through software.

LHWs and vaccinator are study independent variables in EPI programs and the dependent variable is community awareness and coverage. Data is collected in the survey form. Survey form that is designed Directorate of EPI Punjab. Survey forms are filled by trained staff of WHO, union council's polio officers. Four clusters were selected from randomly selected union council. Two clusters are taken from each, LHWs covered and uncovered areas in each union council. Clusters are selected through simple random sampling. In each cluster, 12 children are checked; one child was selected from one house through a random table. Children were selected from 0-23 months on survey form and other quality indicators are also studied

Data is segmented and separated on the basis of LHWs covered and uncovered areas in the union councils of selected Districts. Separate results are drawn for LHWs covered and uncovered areas. Each interview team is composed of two members so that interviewers can check each other's work and make sure information is recorded accurately and completely. One team of interviewers to be expected to complete one cluster each day. The survey is done by people who did not do the immunization. Both the number of surveyors and the length of the survey are interdependent. Generally, good surveyors are limited in number. A team of 2 surveyors can visit one cluster a day. List all localities with their population are provided them. Area of one lady health worker is a good option as almost all localities are of same field burden. The complete cluster identification survey form is distributed. It is explained in group work.

SELECTION OF THE FIRST HOUSE IN THE SAME WAY IN LHWS COVERED AND UNCOVERED AREAS

Select a central location in the village or town, such as a market, a mosque or a church. The location should be near the approximate geographical center of the village or area. Two clusters are taken from LHWs covered and two from uncovered areas Randomly select the direction from the center. This can be done in a variety of ways; for example, you may choose to spin a bottle on the even ground and wherever the bottle point when it stops indicates the direction.

Walk in the selected direction, counting the number of houses until you reach the edge of the village. Select a random number between one and the total number of houses along the directional line selected and return to this house. For example, if you randomly select the number nine, you will visit the ninth house from the central location in the chosen direction.

Determine if there are subdivisions (geographical, political) of the urban area which contain approximately equal populations, or which can be grouped to obtain equal population distribution.

If such subdivisions exist, number each subdivision and select a random number between one and the total number of subdivisions. The selected number indicates the subdivision in which the initial household is located. Generally, lists of houses are not available, follow one of the methods described under 'in rural areas where household lists are not available'. If there are no clear subdivisions, divide the urban area into subunits of the approximately equal population; for example, blocks of about 100 houses. Do this by examining a map and discussing population distribution with government and health officials in the area. Once the subdivisions are established, number each subdivision and follow the procedure described in Method 1.

Determine if there are subdivisions (geographical, political) of the urban area which contain approximately equal populations, or which can be grouped to obtain equal population distribution. If such subdivisions exist, number each subdivision and select a random number between one and the total number of subdivisions. The selected number indicate the subdivision in which the initial household is located. Generally, lists of houses are not available, follow one of the methods described under 'in rural areas where household lists are not available. If there are no clear subdivisions, divide the urban area into subunits of the approximately equal population; for example, blocks of about 100 houses. Do this by examining a map and discussing population distribution with government and health officials in the area. Once the subdivisions are established, number each subdivision and follow the procedure described in Method 1. Select subsequent house A household is defined as a group of people sharing the same kitchen, Urban areas you may find many households in a single building. In apartment

buildings, use the following system. First, choose one floor at random.

Then number the households on the selected floor and randomly select the first household to visit. The second household to visit is the door nearest to the first.

After you have visited all the households on the floor, randomly choose a direction (i.e. up or down). Visit all the households on that floor. Continue from floor to floor visiting the next nearest floor which has not been visited previously. After the whole building has been visited, go to the nearest door of the nearest building and repeat the process. If multiple families live together (i.e. share cooking and sleeping quarters), this is defined as a single household, and only the eligible child of the combined families should be included in the survey.

RESEARCH DESIGN

Comparative analysis descriptive study design is used. Primary data is collected from households which comprised of different variables according to the research hypothesis. There are two independent variables, LHWs, and vaccinators who are leaving more impact on dependent variables, quality coverage of target children. Random sampling is carried out to select areas of union councils, union councils and districts of South Punjab.Primary data is collected by interviewing households. Secondary data is collected from vaccinators and LHWs and household vaccination records.

DATA ANALYSIS

Data is taken on survey forms which are prepared by district allied partner staff. Clusters are taken from 20 UCs of Multan, 15 UCs of Khanewal, 13 UCs of Vehari and 11 UCs of Lodhran. Clusters will be taken according to the proportion of the population. Clusters will be taken from LHWs covered and uncovered areas. Total coverage is measured against the target. Excel spreadsheets will be used to compile and compare data. Data is inducted. Data is entered into SPSS software. Statistical collections are taken from SPSS. Data are presented in tables, pie charts and bar charts. The analytic statistic is applied. Comparative analysis is conducted

Total coverage of BCG+OPV zero, PENTA1 + PCV10+ OPV 1, PENTA2+ PCV10+OPV2, PENTA 3+ PCV10+ OPV3+IPV, measles 1 and measles 2 coverage from since birth to 23rd month of age group. Data regarding due defaulter list, community awareness and inconsistent with plans will also be taken. Data is compiled at the district level. Each antigen vaccination status is measured according to age for the expected vaccine. One-month late vaccination is acceptable but more than one month is taken in the failure group and considered as a no vaccination as per Provincial policy. Data is ordered age wise and district wise.

Null Hypothesis: No difference of immunization coverage in LHWs covered areas and uncovered areas Alternative Hypothesis: Difference in immunization coverage, more immunization coverage in LHWs covered areas and less in uncovered areas. Tables, figures, and graph will be devised to interpret and display data. The conclusion is drawn on the basis of data findings. The confidence level is considered as 95%. The confidence interval is calculated. Correlation and regression are calculated.

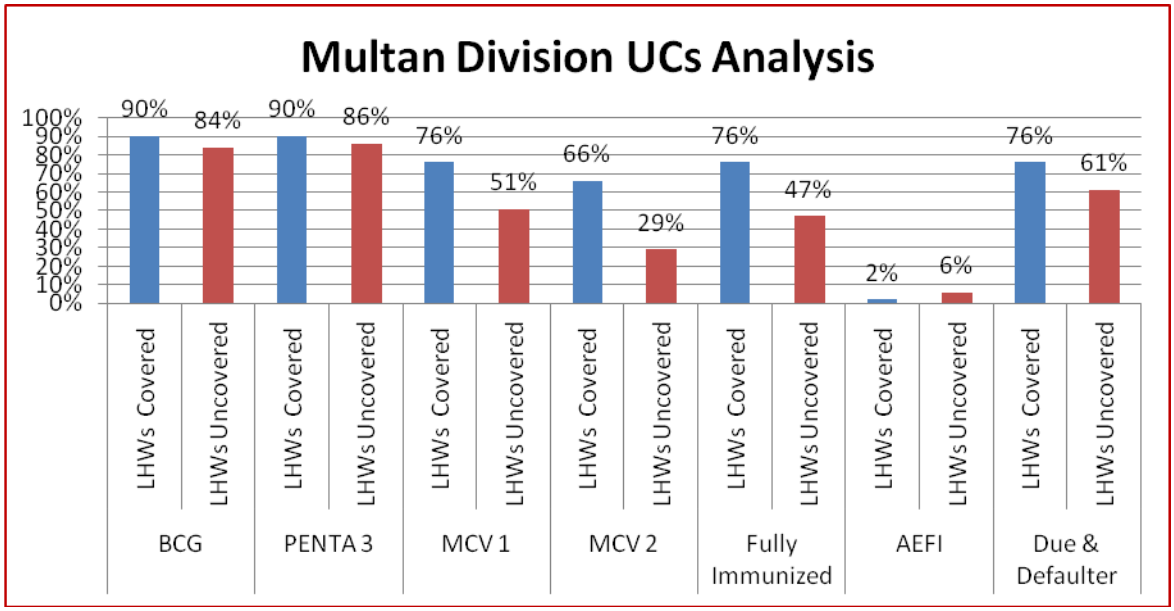
DELIMITATIONS

The results of this study are limited to coverage. However, these results form the basis for further research with immunization session conduction quality A cluster is a randomly selected group which contains 10 children in the age group to be evaluated regarding child immunization, the mothers of seven children in a specific age group to evaluate Tetanus Toxoid (TT) coverage, a coverage survey contains 60 clusters and meets the following standards of reliability. The results of the survey will have a level of accuracy of within 10%; e. g. if the survey shows immunization coverage of 70% in the sample, the coverage in the target population would be between 60% and 80%. The level of confidence is 95%, which means that in 19 out of 20 cases the results of the survey is within the stated level of accuracy (i.e. plus or minus 10%).

Table 1: Coverage Comparison Union Council Wise

DISTRICT WISE UNION COUNCIL ANALYSIS																
Districts	Total UC covered	Total Uc uncovered	BCG < 80%		PENTA 3 < 80%		Fully Immunized < 80%		Measles 1 < 80%		Measles 2 < 80%		AEFI < 80%		D/D Lists < 80%	
			Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered	Covered	Uncovered
Khanewal	15	14	1	2	1	2	7	8	5	9	9	11	1	1	4	9
Vehari	13	13	0	1	1	2	2	9	3	8	5	12	1	1	2	2
Lodhran	11	7	5	5	3	4	5	5	6	5	6	6	0	0	2	0
Multan	19	15	0	0	0	0	0	4	0	2	0	6	0	1	6	8
Total	58	49	6	8	5	8	14	26	14	24	20	35	2	3	14	19
%age			90%	84%	91%	86%	76%	47%	76%	51%	66%	29%	2%	6%	76%	61%

Union council wise analysis reveals that 90% & 84% UCs have BCG coverage >80% in LHWs covered and uncovered areas respectively. 91% & 86% UCs have PENTA3/OPV3 coverage >80% in LHWs covered and uncovered areas respectively. 76% & 51% UCs have fully immunized children >80% in LHWs covered and uncovered areas respectively. 76% & 51% UCs have measles1 coverage >80% in LHWs covered and uncovered areas respectively. 66% & 29% UCs have measles 2 coverage >80% in LHWs covered and uncovered areas respectively. 2% & 6% UCs have AEFI awareness >80% in LHWs covered and uncovered areas respectively. 76% & 61% UCs have due and defaulter lists >80% in LHWs covered and uncovered areas respectively.



DISTRICTS WISE ROUTINE VACCINATION COVERAGE ANALYSIS
(Multan Division comprises of four Districts)

Table 2: Frequency Distribution of BCG Antigen Multan Division

Age match BCG/OPV 0 coverage in LHWs covered areas(Age match=1month grace time on a due date)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

Age match BCG/OPV 0 coverage in LHWs uncovered areas(Age match=1month grace time on a due date)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 3 Districts BCG coverages are >80%. LHWs uncovered Areas: 3 Districts BCG coverages are >80%

Table 3: Frequency Distribution of PENTA3, PCV10 & OPV3 Antigens Multan Division

Age match PENTA 3/PCV10/OPV3 coverage in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

Age match PENTA 3/PCV10/OPV3 coverage in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 3 Districts PENTA3 coverages are >80%. LHWs uncovered Areas: PENTA 3 coverage in 3 Districts is >80%.

Table 4: Frequency Distribution of IPV Antigen Multan Division

Age match IPV coverage in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	
Age match IPV coverage in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 3 Districts IPV coverages are >80%. LHWs uncovered Areas: 3 Districts IPV coverages are >80%.

Table 5: Frequency Distribution of M1 Antigen Multan Division

Age match measles 1 coverage in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	
Age match measles 1 coverage in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	2	50.0	50.0	50.0
	Less than 80	2	50.0	50.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 2 Districts M1 coverages are >80%. LHWs uncovered Areas: 2 Districts M1 coverages are >80%.

Table 6: Frequency Distribution of M 2 Antigen Multan Division

Age match measles 2 coverage in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	2	50.0	50.0	50.0
	Less than 80	2	50.0	50.0	100.0
	Total	4	100.0	100.0	
Age match measles 2 coverage in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	1	25.0	25.0	25.0
	Less than 80	3	75.0	75.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 2 Districts M2 coverages are >80%. LHWs uncovered Areas: 1 District M2 coverage is >80%.

Table 7: Frequency Distribution of AEFI Awareness of Community Multan Division

Community AEFI awareness in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50 or more than	1	25.0	25.0	25.0
	Less than 50	3	75.0	75.0	100.0
	Total	4	100.0	100.0	
Community AEFI awareness in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50 or more than	2	50.0	50.0	50.0
	Less than 50	2	50.0	50.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 1 District AEFI Awareness among Community is >50%. LHWs uncovered Areas: 2 Districts AEFI Awareness among Communities are >50%

Table 8: Frequency Distribution of presence of Due & Defaulter list with Vaccinators Multan Division

Presence of due & defaulter list with vaccinator in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	3	75.0	75.0	75.0
	Less than 80	1	25.0	25.0	100.0
	Total	4	100.0	100.0	
Presence of due & defaulter list with vaccinator in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	1	25.0	25.0	25.0
	Less than 80	3	75.0	75.0	100.0
	Total	4	100.0	100.0	

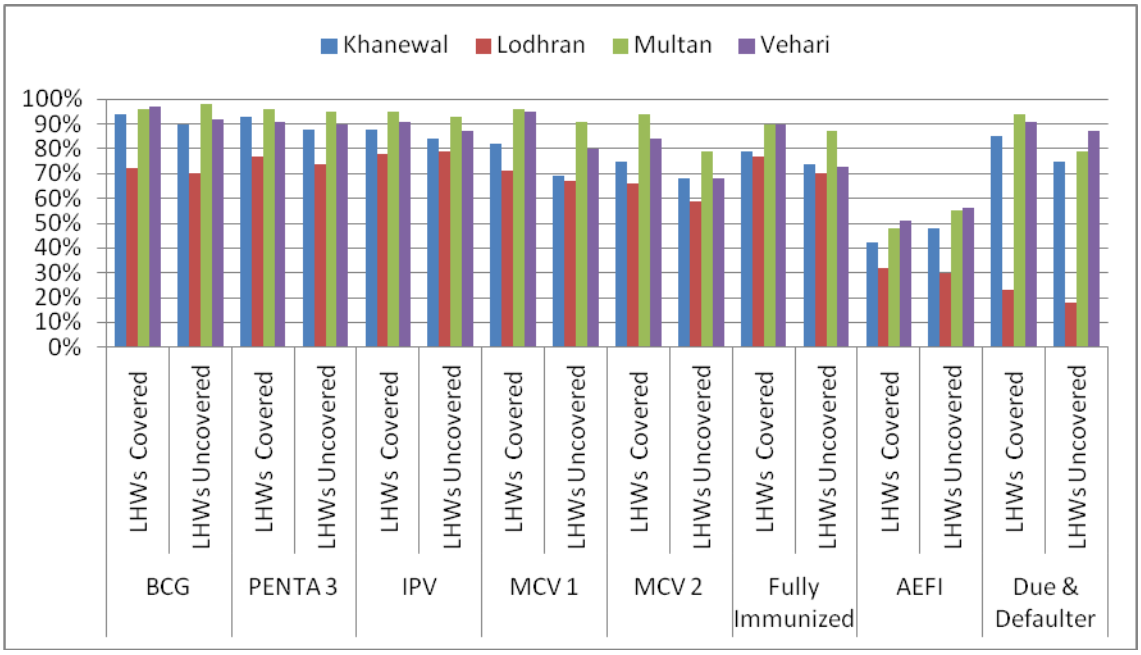
LHWs covered Areas: 3 Districts D & D list presence is >80%. LHWs uncovered Areas: 1 District D & D list presence is >80%

Table 9: Frequency Distribution of Fully Immunized Children Multan Division

Fully immunized coverage in LHWs covered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	2	50.0	50.0	50.0
	Less than 80	2	50.0	50.0	100.0
	Total	4	100.0	100.0	
Fully immunized coverage in LHWs uncovered areas					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	80 or more than	1	25.0	25.0	25.0
	Less than 80	3	75.0	75.0	100.0
	Total	4	100.0	100.0	

LHWs covered Areas: 2 Districts coverage is >80%. LHWs uncovered Areas: 1 District coverage is <80

Districts Wise Summary of Routine Immunization Coverage Comparison in LHWs Covered and Uncovered Areas Multan Division



DISCUSSION:

Statistics analysis of BCG and PENTA 3 antigen coverage in LHWs covered and an uncovered area reveals in Table 16 that SD is the same in both areas Statistics analysis of IPV and M1 antigen coverage in LHWs covered and an uncovered area reveals in Table 17 that SD is the same in both areas Statistical analysis shows in table 18 that SD is high in LHWs uncovered areas regarding M2 coverage. Statistical analysis shows in table 18 that SD is high in LHWs covered areas regarding AEFI awareness in the community Statistical analysis shows in table 19 that SD is slightly greater in LHWs uncovered areas regarding due & defaulter list presence with vaccinators as compared to LHWs covered areas.SD is greater in LHWs covered areas regarding fully immunized children as compared to LHWs uncovered areas. This portrays that fully immunized children coverage is significantly better in LHWs covered areas.

Statistical analysis shows in table 19 that SD is higher in LHWs covered areas regarding fully immunized children Table 1 depicts % age of union council having performance > 80%. It shows the difference between LHW covered and uncovered areas regarding routine vaccination of different antigens. Table 2 reveals that frequency distribution of BCG antigen in Multan Division, in LHWs, covered areas, three out of four Districts BCG and OPV 0 coverages are >80% and three out of four BCG and OPV 0 coverages are >80% in LHWs uncovered areas. There is no difference. Table 3 depicts that frequency distribution of PENTA3, PCV10 & OPV3 antigens in Multan Division, in LHWs covered areas, three out of four Districts PENTA 3, PCV 10 & OPV3 coverages are >80% and three out four Districts PENTA 3, PCV 10 & OPV3 coverages are >80% in LHWs uncovered areas. There seems to be no difference. Table 4 explains that frequency distribution of IPV antigen in Multan Division, in LHWs covered areas, three out four Districts IPV coverages are >80% and three out of four Districts IPV coverages are >80% in LHWs uncovered areas. There are no differences in coverages.

Table 5 indicates that frequency distribution of M1 antigen in Multan Division, in LHWs covered areas, three out of four Districts M1 coverages are >80% as compared to two out of four Districts M1 coverages are >80% in LHWs uncovered areas. Table 6 explains that frequency distribution of M 2 antigen in Multan Division. In LHWs covered areas, two out of four Districts M2 coverages are >80% as compared to one out of four Districts M2 coverage is >80% in LHWs uncovered areas.

Table 7 reveals that frequency distribution of AEFI Awareness among Community in Multan Division. In LHWs covered areas, in one out of four Districts, AEFI Awareness Among Community is >80% as compared to two out of four Districts AEFI Awareness Among Communities are >80% in LHWs

uncovered areas. Table 8 portrays that frequency distribution of presence of Due & Defaulter list with Vaccinators in Multan Division in LHWs covered areas, in three out of four Districts, vaccinators have D & F list in >80% cases as compared to one out of four Districts, vaccinators have D & F list in >80% cases in LHWs uncovered areas. Table 9 reflects that frequency distribution of fully immunized children in Multan Division. In LHWs covered areas, in two out of four Districts coverages are >80% and in LHWs uncovered Areas, one out of four District coverage is <80%.

CONCLUSION:

The benchmark coverage is 80%. The frequency distribution of coverage revealed that BCG, PENTA3/OPV3/PCV 10 coverage is almost equal in both LHWs covered and uncovered areas. In one out of four Districts, children have below benchmark coverage of fully immunized children in LHWs uncovered areas, as compared to two out of four Districts, have fully immunized coverage up to the benchmark in LHWs covered areas. In three out of four Districts, vaccination staffs have due and defaulter list in LHWs covered areas as compared to one out of four Districts, vaccination staff have due and defaulter list up to the benchmark in LHWs uncovered areas. In one out of four Districts, communities have awareness about AEFI > 50% in LHWs covered areas as compared to two out four Districts, communities have awareness about AEFI > 50% in LHWs uncovered areas. In three out of four Districts Measles, 1 coverage are > 80% in LHWs covered areas as compared to two out of four Districts coverage's are > 80% in LHWs uncovered areas. Two out of four Districts Measles 2 coverages are > 80% in LHWs covered areas as compared to one out of four Districts M2 coverages are > 80% in LHWs uncovered areas. So, routine immunization coverage is relatively better in LHWs covered areas. LHWs basic role is to support vaccinators in the field to mobilize community at the outreach sessions. Most of the LHWs are performing well, but in some union council, LHWs performances fluctuate and vaccination overages are not up to the mark. Because of non- registration of newborn children for vaccination, non-committed in preparation of vaccination defaulter children list and poor determined to mobilize communities for vaccination. So, there is a need to measure their performances at union council level.

Overall quality of vaccination is superior in LHWs covered areas. Data reveal that dropout rates of vaccination are below 10% in LHWs covered areas (BCG-measles1). Newborn registration is optimal in their own assigned communities. Defaulter lists preparation and defaulter catch up is comparatively superior but there is still room to improve existing quality of work in LHWs covered areas. The uncovered areas are deficient regarding quality immunization activities. As all the vaccinators are male, female staff induction is more help to reach parents in the field.

Communities have better awareness about adverse event following immunization in LHWs uncovered areas. LHWs role is not well visible to enhance community awareness and participation in vaccination activities. Statistical analysis revealed that fully immunized children coverage is significantly better in LHWs covered areas. Frequency distribution explained that measles 1 and measles 2 coverages are better in LHWs covered areas. Overall, they are useful and effective to improve routine vaccination coverage, which will help in the reduction of incidences of vaccine-preventable diseases in a District. Initiation of newer programs will help to improve immunization and reduce refusal rates for vaccination especially underprivileged areas and need to modify the role of LHWs.

54% of male children are vaccinated and 46% of female children are vaccinated. This shows inequality in gender-based vaccination. However, the male and female ratio is 52% male versus 50% female in Pakistan.

SPECIFIC RECOMMENDATIONS

1. LHWs services in a more effective manner:

LHWs are deployed in their local communities. Their services should be monitored regarding their effects in their communities. This task needs to be led by the Director IRMNCH with the consultation of provincial EPI manager and district managers.

2. Enhance LHWs role:

Vaccination coverage is better in LHWs covered areas as compared to uncovered areas in most of the areas, there is a need to increase their role and responsibility uniformly in all the union council's levels to support vaccinators in each District.

Female vaccinator's recruitment may be encouraged to increase access at the household level

3. Improve capacity building of LHWs:

Some LHWs are not well oriented how to register newborn and vaccination defaulter children. There should be need base ongoing training sessions for LHWs at union councils level in each District.

4. Ensure community participation:

Community participation is not optimal in LHWs covered areas. They supposed to be in a close contact with the local community. Community demand for vaccination can only be increased by ensuring their participation in vaccination activities

5. An adverse event following immunization awareness:

Special training sessions are required to conduct LHWs and vaccinators about AEFI identification and reporting. The community should be sensitized about AEFI during vaccination session. Because of lack of awareness, some people are becoming a refusal to vaccination.

6. Integrate the activities of union council field staff

The following field staff work in each union council School Health and Nutrition Supervisor, communicable disease control supervisor, vaccinator, sanitary inspector, sanitary petrol Lady health workers and Lady Health Supervisor. Public health team can be constituted at the UC level to improve routine immunization coverage and other preventive performances.

7. Reduction in LHWs uncovered areas:

LHWs uncovered areas must be reduced or alternative source may be identified to support vaccination activities.

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