

UNIVERSITY OF GHANA
SCHOOL OF PUBLIC HEALTH
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**ASSESSMENT OF SECOND YEAR OF LIFE IMMUNIZATION PERFORMANCE IN
THE ACCRA METROPOLIS**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
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DECLARATION

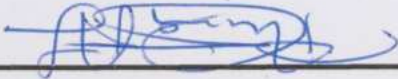
I Oxygen Gershion Wullar hereby declare that except for the peoples' work that have been duly acknowledged, this proposal is the result of my own work, done under supervision and it does not contain any materials which has been accepted for award of any degree at a university.



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DEDICATION

This work is dedicated to the Oxygen family, my mother Mrs Juliana Dei who is late, my father Mr. Francis Dei and all my beloved ones.

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I wish to thank Almighty God, the higher, gracious and the most merciful father, all praises to him for the strength and His blessing in completing this work. My gratitude goes to my beloved wife, Mrs Anita Wullar and my children Bless, Eunice, Oxyboy, Oxyqueen and Oxyjunior for their endless love, prayers and encouragement. Special appreciation goes to my supervisor, Dr. Adolphina Addoley Addo-Lartey, for her supervision and constant support. Her invaluable help of constructive comments and suggestions throughout this work have contributed to the success of this research. I would like to express my gratitude and sincere thanks to Dr. Stella Gyamfi whose contribution to stimulating suggestions and encouragement, helped me to coordinate my work especially in writing this research report. I would like to express my appreciation and sincere thanks to all staff of Okaikoi Sub Metro Health Directorate Especially Disease Control Officers, Public Health Nurses and Community Health Nurses at Kaneshie Polyclinic and Achimota. The last but not the least Special thanks go all mothers participated in focus group discussion for their input.

ABSTRACT

Background

Vaccination in the second year of life is to boost the immunity of children after the first birthday to five years of age. The second-year vaccination exposes children who did not seroconvert during the first year of life vaccination in nine months to now have the opportunity to be fully immunized against killer diseases. The study assesses suboptimal second year of life immunization coverage performance in Okaikoi Sub metro, Accra Metro for 2017.

Method

A mixed method comprising of a qualitative and a quantitative study was used to assess health workers, health facilities and guardians of vaccinees. Semi-structured questionnaire was used for 169 respondents in 28 outreach sites visited and 2 focus group discussion conducted. Chi-square tests were used for bivariate associations between categorical variables and Fisher's exact tests used in instances where the assumptions underlying Chi-square failed (i.e. low expected cell frequencies). Wilcoxon rank-sum test was also used to investigate if significant differences in output levels existed between facilities that had a shortage of vaccines and those that did not.

Results

The results showed that facilities without shortage had a mean output level of 23.3% compared to the mean output level of 49.8% for those with shortage and this difference was highly significant ($p < 0.001$). All facilities that know of the second year of life catch up policies also had a shortage of the vaccines compared to only some of those that did not know the policies and these differences were significant ($p < 0.007$). Most mothers do not go for vaccination after 9 months due to health staff not scheduling them as identified in focus group discussion.

Conclusion

Shortcomings identified in this research shows that serious challenges do exist which have to be addressed when vaccines are introduced. The irregular vaccine shortage in the facilities and staff not scheduling for 18 months after receiving 9 months vaccination is found to be some factors affected the vaccination coverage performance which if addressed will significantly help improve the second year of life immunization coverages.

Key words: Measles-Rubella, Meningococcal A Conjugate, immunization, vaccination, coverages.

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ABBREVIATIONS

ACH	ACHIMOTA
1YL	FIRST YEAR OF LIFE
2YL	SECOND YEAR OF LIFE
CHPS	COMMUNITY-BASED HEALTH PLANNING SERVICES
cYMP	COMPREHENSIVE YEAR MULTI PLAN FOR IMMUNIZATIONS
EPI	EXPANDED PROGRAM ON IMMUNIZATION
GHS	GHANA HEALTH SERVICE
GPRS	GHANA POVERTY REDUCTION STRATEGY
KPC	KANESHIE POLYCLINIC
MDG	MILLENNIUM DEVELOPMENT GOALS
MEN A	MENINGOCOCCAL CONJUGATE A VACCINE
MOH	MINISTRY OF HEALTH
MR	MEASLES RUBELLA
MR 1	MEASLES RUBELLA FIRST DOSE
MR 2	MEASLES RUBELLA SECOND DOSE
MSD	MEASLES SECOND DOSE
NS	NSAWAM
RCH	REPRODUCTIVE AND CHILD HEALTH

RD	ROAD
PHC	POPULATION AND HOUSING CENSUS
U5MR	UNDER FIVE YEARS MORTALITY RATE
WPV	WILD POLIO VIRUS

CHAPTER ONE

INTRODUCTION

1.1 Background

Ghana has made a lot of progress in immunization throughout the country culminating in a considerable reduction in morbidities, disabilities and mortalities associated with vaccine-preventable diseases such as whooping cough, pertussis, yellow fever, poliomyelitis and measles. Immunization, a routine activity within the health sector continues to be one of the key areas within the health system. Accra Metropolis is characterized by a high floating population which outbreak of measles, rubella and meningitis will be a serious public health burden. The measles-rubella (MR) vaccine protects against measles, rubella and congenital rubella syndrome. Any child who does not receive the first dose of MR vaccine at 9 months is given the vaccine at first contact and the second dose will be provided at 18 months. Meningococcal A Conjugate Vaccine (Men A) protects against *Neisseria Meningitis*. One dose of the vaccine is administered at 18 months, the same time as second dose measles-rubella vaccination. The life of children under five years is of great concern as they are vulnerable to disease for surviving into older age where immunization is successful.

Ghana introduced the second dose of measles in 2012 as the second year of life vaccines given at 18 months. In September 2016 a new second year of life vaccine was added to Meningococcal Conjugate A vaccine (Men A) given at 18 months. The measles vaccination as a single disease was switched to measles-rubella vaccine to cover two diseases which were started in October 2016 (MOH/GHS,WHO, 2016). Even though a lot of effort is still being made to maintain the gains made in the second year of life (2YL) coverages as compared with the first year of life (1YL) coverages which is low and this obviously is worrying.

Ghana is making progressive improvements in the health status of the population. Notwithstanding, the country is confronted with the double burden of disease across all ages and sexes, with non-communicable diseases becoming the major cause of morbidity and mortality alongside the existing and emerging communicable diseases (MOH/GHS,WHO, 2015).

Child health has significantly improved over the years, with the child survival rates increasing as a result of the high impact healthcare services and economic progress. Despite these efforts, one in eleven Ghanaian children dies before their fifth birthday, largely from preventable childhood diseases (MOH/GHS,WHO, 2015). In 2000, Ghana recorded an under-five mortality rate of 167 per 1000 live births that declined to 90 per 1000 live births in 2010, an estimated 46 percent decline. This decline notwithstanding indicates that Ghana although making progress still appears off-track in achieving the MDG 4 target of 39.9 per 1000 live births by 2018, as the progress is slow (PHC, 2013).

Variations across the country show that under-five mortality rate (U5MR) is comparatively lower in urban than in rural areas. According to the 2010 Ghana Population and Housing Census (PHC), U5MR in rural areas is 90 deaths per 1000 live births compared to 83 deaths per 1000 live births in urban areas. Mortality is higher among male children than among female children, comparative U5MR for male and female children in urban areas were 92 and 76 deaths per 1000 live births, respectively. In rural areas, U5MR among male and female children were 98 and 82 deaths per 1000 live births, respectively (PHC, 2013). The implications of such low immunization coverage in a geographical area like Accra which has about 10% of the national population is all too evident.

A number of contributory factors such as increased socio-economic development and immunization of children against vaccine-preventable diseases as outlined in the Child Health

Policy account for much of the progress made in reducing morbidity and mortality. The country has not recorded any documented death from measles since 2003, and since November 2008 there has not been any report of wild poliovirus (WPV) (MOH/GHS,WHO, 2015).

Immunization against vaccine-preventable diseases delineates the one key intervention to be scaled up alongside the continuum of care. This focuses on improving access and quality, as well as increasing the demand for essential services. The introduction of new vaccines such as the 2nd dose measles, pneumococcal and rotavirus vaccines to protect the children under 5 years through the national Expanded Programme on Immunization (EPI) (MOH/GHS,WHO, 2016).

An estimated 40 percent of all deaths that occur before the age of five have been found to be associated directly and indirectly with under-nutrition, making it the single most important cause of child mortality. In response, several of initiatives have been implemented since 2007. This was a multi-sectoral strategy that sought to address malnutrition as a developmental problem in the context of the Ghana Poverty Reduction Strategy (GPRS). The health sector has expanded its child health interventions specifically in nutrition services, immunization, vitamin A supplementation and deworming that affect child nutritional and health status, primarily through the rapid delivery approach (MOH/GHS,WHO, 2015).

Ghana is confronted with many challenges in child survival, despite a lot of success chalked. The inadequacy of human resources and skills within the health system poses a major obstacle to quality of care especially in the area of neonatal, postnatal and child illnesses. Also, under-reporting of child deaths and inadequate national data to provide complete and reliable information on child health are major contributors to challenges in delivering child health interventions.

Other reviews such as the Ghana Immunization Service Review, 2015; Effective Vaccine Assessment Report 2010; the Policy on immunization 2016; and the Holistic Assessment of the Health Sector Programme of Work 2016 have identified some systemic bottlenecks to improving and sustaining high immunization coverage including:

- Inadequate and poor access to services in hard to reach districts (especially, islands and lake communities).
- Inadequate cold chain capacity at lower levels (about 41% of fridges and freezers are over 10 years).
- Weak community engagement and involvement in immunization services.
- Weak capacity for micro-planning and logistics management at the sub-district and CHPS zone level.
- Poor documentation of primary data which impacts on data quality and.
- Inadequate infrastructure.

1.2 Problem Statement

Immunization has been going on in Accra metropolis since the late seventies with variable success. Various strategies have been used and this includes static, outreach, house to house, mass immunization and mini mass immunization campaigns.

However, for the past three years since the introduction of the second year of life vaccines such as measles /rubella and Meningococcal Conjugate A vaccine (Men A) in the fourth quarter of 2016, there has been an inconsistency in the number of children immunized in the metro as

compared with the first year of life vaccines. There is concern about the same second-year vaccination supposed to be given the same time with differences. Even though there has been some attempt to improve, the efforts have not been uniform across the five Submetros.

Some of the Submetros are doing quite well at least by minimizing differences between series 1 and 2 and improved on previous year performance whilst some are not doing so well. It has become necessary to identify reasons for this discrepancy in performance since the flow of funds and other resources have been fairly regular with the view to helping them do the appropriate interventions.

1.3 Justification

The data presented in table 1 and 2 explains the differences between MR1, MR2 and Men A immunization coverages which Accra Metropolis were unable to achieve 85% and above for population herd immunity (MR1 78.75%, MR2 69.40% and Men A 71.38%). Okaikoi Submetro in 2017 achieved 96.37% for MR1 the highest performance, 78.04% for MR2 and 72.85% for Men A with dropout rate between MR2 and Men A 6.65% given the worse Submetro dropout rate. The population herd immunity status for the second year of life vaccine is paramount to achieving at least 95% of performance coverage. The metropolis inability to meet national performance coverage target is causing more concern about community safety for herd immunity. This can lead to an outbreak of the second year of life vaccine (diseases) to uncompromising level.

Table 1: Trend of Measles / Rubella first and second vaccination coverages and dropout rates from 2015 to 2017.

Districts / Metros	2017	2015 Cov.		2016 Cov.		2017 Cov.		2015		2016		2017	
	Target Pop.	MR 1	MR 2	MR 1	MR 2	MR 1	MR 2	MR1-MR2	DOR	MR1-MR2	DOR	MR1-MR2	DOR
Adakuma	32369	17805	17477	21110	17275	23130	21245	328	1.84	3835	18.17	1885	8.15
Ashiedu Keteke	5543	3663	2574	4592	3551	3658	2952	1089	29.73	1041	22.67	706	19.30
Yawaso	20954	14860	12721	15472	13112	16411	14712	2139	14.39	2360	15.25	1699	10.35
Okaikoi	14561	11201	9229	11430	8374	13923	11364	1972	17.61	3056	26.74	2559	18.38
Abokotey	6037	4114	3456	4074	3531	5455	4874	658	15.99	543	13.33	581	10.65
Accra Metro	79464	51643	45457	56678	45843	62577	55147	6186	11.98	10835	19.12	7430	11.87

Source: Accra Metro Health Directorate Annual Report for Disease Control and Prevention 2017

Table 2: Vaccination coverage for Meningococcal Conjugate A vaccine (Men A) compared with second dose of Measles/ Rubella vaccine and Dropout rate for 2017.

Sub Metros	Target Pop. 2017	Men A	% Cov.	MR 2-Men A	DOR
Ablekuma	32369	22913	70.79	-1668	-7.85
Ashiedu Keteke	5543	2960	53.40	-8	-0.27
Ayawaso	20954	14424	68.84	288	1.96
Okaikoi	14561	10608	72.85	756	6.65
Osu Klottey	6037	5818	96.37	-944	-19.37
Accra Metro	79464	56723	71.38	-1576	-2.86

Source: Accra Metro Health Directorate Annual Report for Disease Control and Prevention 2017

1.4 Conceptual framework

A conceptual framework for the second year of life immunization program in Accra Metropolis. In this framework, annual Sub Metros assessments brought about innovations in the vaccination process. Information obtained on Submetros coverage performance influenced management and motivated health staff to consider alternative interventions to motivate guardians. Depending on available resources and the Submetros population, staff modified Child Welfare Clinics immunization practices, which ultimately led to improved Second Year of Life vaccination coverage by Sub Metros.

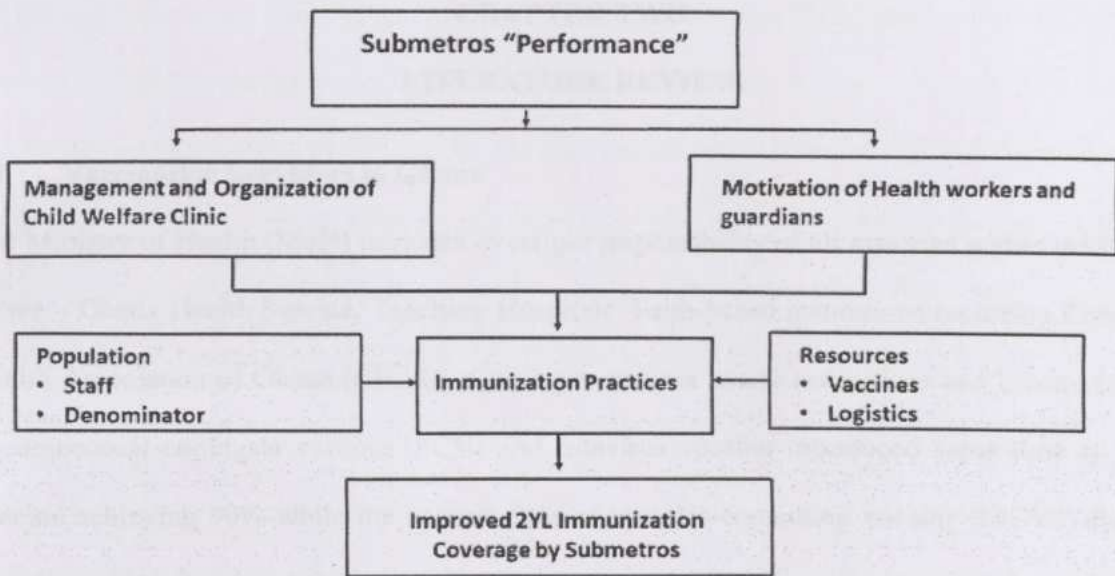


Figure 1: Conceptual Framework for improved Second Year of Life (2YL) Immunization in Accra Metropolis.

1.5 General objective

To assess suboptimal second year of life immunization coverage performance in Okaikoi Sub metro, Accra Metro for 2017.

1.6 Specific objectives

1. To assess annual vaccination coverage from 2017 to the first quarter of 2019.
2. To assess factors that contribute to service providers output.
3. To identify health facilities factors that may lead to low immunization coverage.
4. To assess how parents or clients' factors affect immunization activities.

CHAPTER TWO

LITERATURE REVIEW

2.1 Vaccination providers in Ghana

The Ministry of Health (MoH) provides oversight responsibility of all agencies within the health sector – Ghana Health Service, Teaching Hospitals, Faith-based institutions including Christian Health Association of Ghana (CHAG), Quasi-government health institutions and Private sector. Pneumococcal conjugate vaccine (PCV) and rotavirus vaccine introduced same time as 1YL vaccine achieving 90% while the second dose of measles-containing vaccine (MCV2) did not rise above 70% (Nyaku et al., 2017). The ultimate goal of the Ghana health sector is to ensure a healthy and productive population that reproduces itself safely. Ghana's National Health Policy (2007) was developed in line with the Primary Health Care Approach and Regional strategies. This provides direction on the national health strategic plans in order to harmonize and align the management and provision of comprehensive essential health services throughout Ghana (MOH/GHS,WHO,UNICEF, 2016). The critical driver for Ghana was to operationalize the Alma Ata goal of "Health for All". (GHS, 2017). Vaccination is a critical pillar in bringing health to children in Ghana where the public and private partnership is paramount in bringing health closer to the door steps of the populace (World Health Organisation, 2003).

2.2 Benefit of vaccination

The 2011 Multi-indicator Cluster Survey (MICS 2011) estimated that there were twice as many under-fives dying per 1,000 live births in the poorest wealth quintile in comparison to the richest. The U5MR has reduced in all the regions in Ghana with the largest decline recorded in the Greater Accra region, reducing by about 100 percent, 72 deaths per 1,000 live births (GSS; GHS; ICF International, 2015; PHC, 2013). Poverty is a major contributor to the probability of a child

dying before the age of five years. It has been estimated that without immunization 3% of all children will die from measles (MOH/GHS,WHO, 2015).

The national Infant Mortality Rate (IMR) has also declined over time. The IMR dropped from 90 deaths per 1000 live births in 2000 to 59 deaths per 1000 live births (PHC, 2013). In the (GSS; GHS; ICF International, 2015), however IMR was 50 per 1000 live births over the survey period. Again, although there has been substantial progress towards achieving the MDG target of 26 per 1000 live births by 2015, to actually achieve this target remains a major challenge.

Ghana recognizes the urgent need for primary health care for all its citizens in order to expand preventive and rehabilitative as well as curative care. Meningococcal disease case fatality among children 1-4 years in the USA is 15.2% (Pieterse, 2004). The country adopted an evidence-based primary strategy to reach the unreached, essentially recognizing the role of households in achieving the national health goals. This call for bridging geographical access gaps in order to bring basic yet essential health services to communities, while making up for the gap in human resources for health and augmenting their capacities.

2.3 CHPS concept and immunization

Ghana's community-based health planning and services (CHPS) approach is the national strategy for addressing these gaps in access to quality health services at the community level. CHPS is equity-focused and has an implementation modality that has the strong support of the government and development partners in the health sector. Through the CHPS close-to-client approach, there have been significant reductions in immunization dropout rates and improvements in coverage, service accessibility, and quality of maternal and family planning care essentially bridging the access gap between communities and health facilities (GHS, 2017). The CHPS is thus recognized as the lowest level of health service delivery in the health sector.

The sub-district level comprises of health centers, which serve as the next referral level after CHPS and provide oversight to CHPS. The training provided for community health training nurses as CHO,s was well understood in providing urban CHPS (Nwameme, Tabong, & Adongo, 2018).

2.4 District immunization focus

The District Health Services (Management Teams) have been empowered to take on full oversight responsibilities to ensure that all public health initiatives (implementation activities) are organized and synchronized in collaboration with other sectors particularly District Assemblies. This set pace for one of the current strengths of the country's routine immunization system as well as national campaigns, which augment routine efforts. The Government continues its commitment to financing immunizations nationally and no one is required to pay for childhood vaccines.

Several innovative strategies are used to deliver immunization services. Static immunization is the main service delivery strategy. Every health facility has a static clinic responsible for daily routine immunizations. The increasing availability of such clinics in the country has made access to routine immunization easier. Outreach immunization services are organized to reach children in communities where static clinics are not available. The outreach programme has contributed immensely towards bridging the gap between communities with health facilities and those who do not have. Thus, increasing access to EPI services to all eligible children and women. Mop-ups are also done in areas with low coverage and difficult to reach areas (areas not accessible during the rainy season) with the aim of reaching every child. Transit point vaccination including vaccinations done at Lorry parks, markets, churches, mosques etc. is also used. When necessary, mass vaccinations are conducted to reach out to specific groups.

Ghana successfully introduced four new vaccines in 2012. Three of these vaccines (measles second dose (MSD), Rota Virus Vaccine and Pneumococcal Vaccines) were introduced into the routine immunization program. The fourth one, which is Men A was introduced in a campaign mode in the three regions in the North, targeting the age group 1-29 years. In 2013, Ghana received support for HPV demonstration in four districts. The country also introduced the Measles-Rubella (MR) vaccine into the routine immunization program. The uptake of these new vaccines has been satisfactory except MSD.

2.5 Immunization programme in Ghana

The country has good experience with regards to the introduction of new vaccines into routine immunization as well as deploying new vaccines through mass vaccination. There are well-organized structures as well as competent staff to guide the introduction of new vaccines. Technical expertise is drawn from both within and outside of the EPI Programme. There are established committees that take care of all the technical elements which are common to any new vaccine introduction. These committees include cold chain, training and service delivery, logistics and waste management, surveillance, communication.

In the area of advocacy, communication and social mobilization, previous introductions have shown that adequate public education and high-level advocacy contributed to the acceptance of new vaccines by the general population. Development, printing and dissemination of fact sheets also help service providers to know what and how to communicate to the public. Development of training plan and training materials enabled facilitators at all levels to conduct standardized trainings. Cascaded training ensured all levels were trained on all aspects of vaccine introductions. Early revision and printing of data collection tools in the previous introduction

was found to be very important. Portions were created in the existing data collection tools for new vaccines. This ensured the recording and reporting of performance of new vaccines.

Experience in vaccine introductions has shown that critical attention must be paid to cold chain availability, requirements and plans for improvements where necessary. Every new vaccine has an impact on cold chain requirement. Fortunately for Ghana, the recent introduction of vaccines for pneumonia and diarrhea led to an expansion of the cold chain capacity nationwide. However, there are some deficits, especially, at the national, district and facility levels.

In previous introductions, the existing surveillance systems for the disease of interest were enhanced. In addition, special adverse event surveillance systems were set up to monitor any event reported after administration of the vaccine. Monitoring and supervision was also a key component of previous introductions. The country also introduced peer-monitoring and reviews among regions for best practices to be shared and bad practices avoided.

2.6 Urban Immunization in Ghana

Immunization in metropolitan and cosmopolitan areas in Ghana is a huge challenge with the rate of migration from the rural to urban areas which is of great concern. There is no definition for a city which is greater than a town. GHS, the MoH and in-country stakeholders are implementing measures to further identify and target the needs and challenges of urban poor and addressing low immunization coverage among urban communities. These measures include: mapping of urban and peri-urban slums, establishing container clinics at markets within urban poor areas, and conducting market and weekend vaccination sessions. Ongoing efforts include engagement of community structures through durbars, market queens, and in some cases, use of radio. With support from the US Centers for Disease Control and in close collaboration with GHS and the private sector, container clinics are in use as part of 2YL interventions in metropolitan areas

(WHO/UNICEF, 2017). The country's urban population grew more than three-fold between 1984 and 2014 (PHC, 2013), increasing the number of under-immunized children in these areas.

2.7 Mixed opportunities in vaccination

Today we are vaccinating more children than ever, yet millions of children still miss out on routine vaccinations. National immunization programmes continue to seek evidence-based strategies to understand the underlying reasons and to design tailored approaches to address them. Using a participatory mixed-methods approach, the MOV strategy provides step-by-step guidance on how to conduct a bottom-up root-cause analysis of bottle-necks in the immunization programme and to implement relevant interventions to address them (Shendale, 2019).

The MOV strategy should not be viewed as a stand-alone or discrete “project”; rather as complementary to existing microplanning and programme improvement approaches such as RED (‘Reaching Every District’). The MOV strategy is conceived as a health system-wide service improvement effort targeted at improving vaccination as well as other health services within a given health facility (Shendale, 2019).

CHAPTER THREE

METHODS

3.1 Study Area

The study area was Okaikoi Submetro with two areas namely the Kaneshie zone and Achimota zone. This is well-populated areas especially Kaneshie area and is inhabited by a wide diversity of ethnic groups from all parts of Ghana and beyond.

Map Showing Study Area

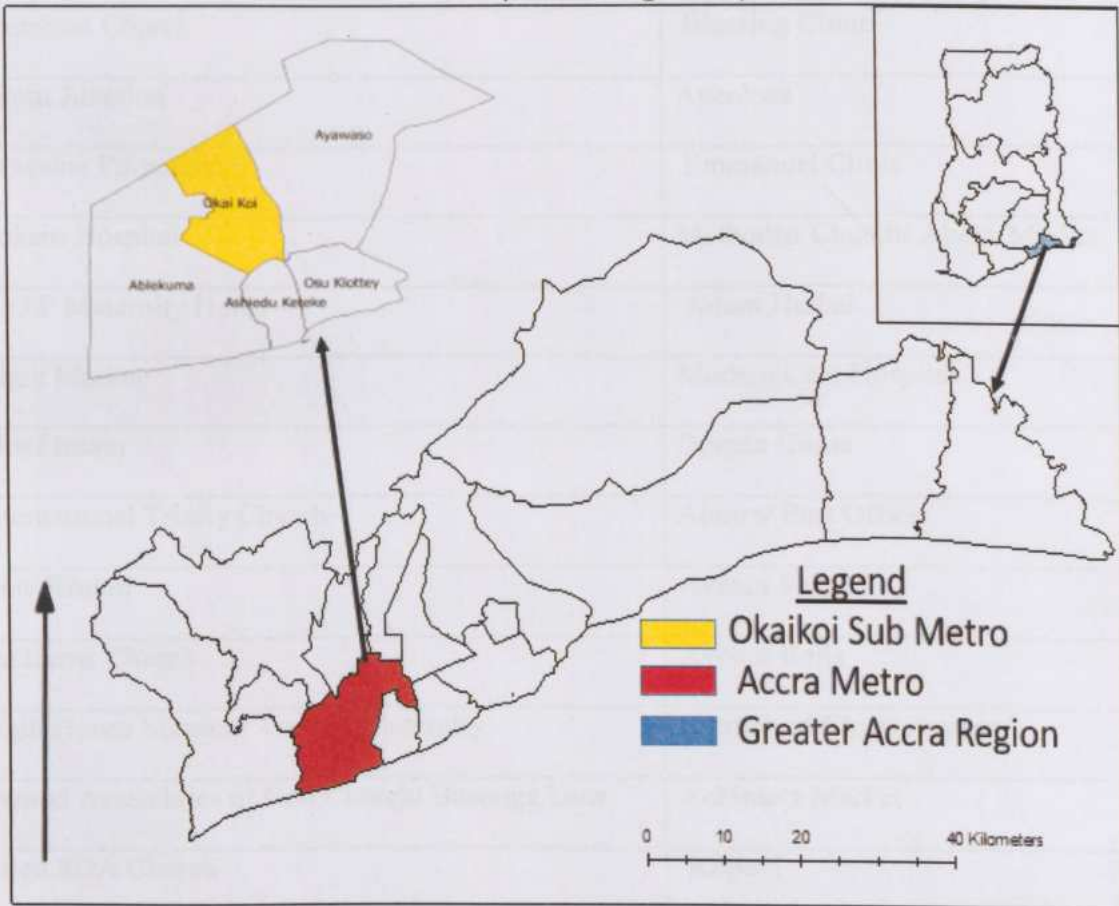


Figure 2: Shows the map of study area Okaikoi Sub Metro within Greater Accra and Accra Metropolis.

Table 3: List of Child Welfare Clinic points under Kaneshie zone

Lapaz Community Hospital	Ayigbe Town Pentecost Church
New Market	Rabenrich Maternity
Bambolino	Kantsian
Motorway Lapaz	Holy Trinity Hospital
Transformer/Accra Station	Lakeside Clinic
Nkordaasusua	Baptist Church
Kaneshie Market	Hobat Clinic
Pentecost Church	Blessing Clinic
Akotu Junction	Apenkwa
Kaneshie Polyclinic	Emmanuel Clinic
Ankam Hospital	Methodist Church/ Abeka Market
P.O.P Maternity Home	Adom Herbal
Night Market	Modern Care Hospital
Chief Imam	Opman Clinic
International Trinity Church	Abotre/ Post Office
Ante Korkor	Avenor Proper
Pentecost Church	Avenor Rails
Light House Mission/ Theresa Maternity	Church of Christ Avenor
Demod Assemblies of God Church/ Busanga Lane	Achimota Market
Atico SDA Church	Kopevi
Alogboshie	Avenor CHPS

Source: Kaneshie polyclinic Public Health Nursing Unit.

List of Child Welfare Clinic points in Achimota Zone

- Abofu CHPS
- Achimota Hospital
- Achimota Market CHPS
- Achimota School Clinic
- Achimota Transport Terminal Clinic
- Alogboshie CHPS
- Anumle CHPS
- Central Achimota Clinic CHPS
- Christian Village CHPS
- Kisseman CHPS
- Midway Clinic

3.2 Study Population

Health workers, health facilities and guardians of vaccinees.

3.3 Study type and design

A mixed method comprising of a qualitative and a quantitative study. Cross sectional study design.

3.4 Variables

3.4.1 Dependent variable

Second-year of life immunization coverage performance in Okaikoi Submetro in Accra Metropolitan area.

Table 4: Independent Variables and meaning

Independent Variables	Meaning
Operational Strategies	The way vaccination is carried out by community health nurses
Vaccines availability and adequacy	Taking of vaccines on charge in Vaccine Ledger Books with maintaining minimum and maximum stock level
Needles and syringes availability and adequacy	Taking charge of Needles and syringes received from Metro Stores into ledger books
Tally book availability and adequacy	Taking stock of Immunization tally books in use
Cold chain availability and adequacy	Taken inventory of cold chain equipment and its function ability
Planning for child welfare clinics	Availability of planned schedule for child welfare clinics by Nurses
Transport itinerary availability	Mode of transportation and how nurses reach child welfare clinics
Logistics release arrangements	How vaccines and other items needed for successful child welfare clinic is released
Time of departure for outreach	Time Community Health Nurses set off to child welfare clinic and start work

Table 4: Independent Variables and meaning continues

Independent Variables	Meaning
Supervision of nurses	Observing Public Health Nurses supervision schedule, conduct and reports on it
Assessment of immunization sites and quality of service	Observation of an environment where immunization is carried out and manner they carried out their duties
Problems encountered at outreach points	Staff to express challenges that hinders their performance expected from them
Tally book entries and tallying	Observe correct use of immunization registers
Tally book records and returns submitted compatibility	Checking of returns with entries into DHIMS
Community mobilization arrangements	How staff and community members prepare for immunization session
Mothers' perception on the second year of life immunization	Guardians interpretation of the second year of life immunization
Knowledge of mothers on the second year of life immunization	What staff tell them about the second year of life immunization

3.5 Sample size

169 respondents minimum comprising of Facility heads, Public Health Nurses, Disease Control Officers and Community Health Nurses using finite population formula.

$$n = \frac{Nz^2pq}{d^2(N - 1) + z^2pq}$$

N=200

z=1.96

p =0.5 (50%)

d = 0.03 (3%)

n =169 minimum

The focus group discussion involved 18 mothers which 9 women were recruited at each zone namely Kaneshie and Achimota.

3.6 Sampling method

Purposive sampling was used to identify study samples at the facility level and these include heads of institutions, Public Health nursing officers, disease control officers, community health officers and women in the communities.

Selection of mothers in the community for a focus group discussion was based on a set of criteria which included age group between twenty and thirty-five and having a child age more than 18 months as well as attend child welfare clinics during the day of conducting focus group discussion. This was done with the assistance of nursing officers in charge of child welfare clinics.

3.7 Data collection

The collection involved interviews using structured questionnaires for the heads, nursing officers and community health nurses directly involved in immunization activities in the facilities. The community health nurses were visited in their respective outreach points to administer the questionnaire.

A checklist was used to check on logistics availability, and this included vaccines, child health records, needles and syringes and tally registers from the disease control officers. Another checklist was also used to observe community health nurses carrying out immunization activities at outreach and static clinics. There were record reviews of vaccination data submitted on returns and tally registers and comparison made to check for accuracy. A checklist was used to gather relevant data. Observation of logistics and site of child welfare clinic was done with vaccination coverages. Two separate focus group discussions were conducted with 21 mothers who had more than a child participating.

3.8 Data analysis and processing

The quantitative data collected was entered into a computer using Epi Info 7 software after which it was exported into Stata version 15.1 software for labelling and analysis. Respondents' output was generated by creating a composite score (on a percentage scale) of the variables that served as indicators for output, where 0% indicated poor/none and 100% for the highest output score. Results were presented using tables with frequencies and percentages for the descriptive. Means and standard deviations were also used to show average output levels across some factors. Chi-square tests were used for bivariate associations between categorical variables and Fisher's exact tests used in instances where the assumptions underlying Chi-square failed (i.e. low expected cell frequencies). Wilcoxon rank-sum test was also used to investigate if significant

differences in output levels existed between facilities that had a shortage of vaccines and those that didn't.

Nvivo, was used for qualitative analysis of interview conducted during focus group discussion which was coded, edited and entered to identify reasons for missing the second series of measles-rubella vaccination and that of Men A.

3.9 Ethical consideration

Consent of heads of health facilities as well as community members (guardians) was elicited before the project was carried out. Data was handled in a professional manner to ensure confidentiality. The Community Health Nurses information was kept confidential in order not to have challenges with the supervisors of Public Health Nurses. The inventory that was taken will not be used to prosecute the officer in charge in the case for any differences observed. The facilities conditions in which they carried out Child Welfare Clinics was not implicated in any manner. The guardians of vaccinees information were kept in confidential and used for the purpose of improvement of services but not for the prosecution of any health worker or facility.

CHAPTER FOUR

RESULTS

Vaccination coverages and vaccines used remains a challenge to EPI managers as there are always discrepancies between the two and this study shows the same. The number of doses received, the children vaccinated and the data reported shows about 68% wastage rate or even negative 32% wastage rate which should not have been the case if documentation is taken seriously.

4.1 Coverages

The table 5 shows, Penta 3 children vaccinated for the year 2017 as compared with children vaccinated for MR1, MR2 and Men A. The children vaccinated for Penta 3 at 14 weeks were expected to be vaccinated for MR1 at 9 to 17 months but 1463 children were missed. 2389 children vaccinated for MR1 could not be vaccinated for MR2 between 18 to 59 months. About 1238 children vaccinated for MR2 could not be vaccinated for Men A at the same session and day.

Table 5: Okaikoi Submetro first year of life vaccination coverages and second year of life indicators for 2017

Months	Penta 3	MR1	MR2	Men A
January	1107	1142	895	675
February	1158	969	882	797
March	888	918	527	442
April	1089	871	781	641
May	1431	1267	1115	1090
June	809	1031	807	825
July	1347	1120	914	899
August	1538	1378	1111	1124
September	1453	1350	1075	884
October	1471	1325	1119	787
November	1436	1136	1000	957
December	1325	1082	974	841
Total	15052	13589	11200	9962

Source: Kaneshie polyclinic RCH Unit database.

Table 6, below shows Penta 3 vaccination coverage of 16898 for 2018 which same were expected for MR1 but 2342 children were missed. About 2160 children were missed for MR2 as compared with MR1 and 4502 children missed as compared with Penta 3. 899 children were missed for Men A as compared to MR2 given the same time per EPI schedule.

Table 6: Okaikoi Submetro first year of life vaccination coverages and second year of life indicators for 2018.

Months	Penta 3	MR1	MR2	Men A
January	1434	1280	1047	1051
February	1378	1250	1027	1227
March	1521	1235	1003	1015
April	1551	1251	1072	906
May	1531	1337	1152	914
June	1479	1139	989	600
July	1415	1121	866	750
August	1606	1209	972	955
September	1333	1206	1008	1022
October	1326	1120	1029	957
November	1172	1197	1117	986
December	1152	1211	1114	1114
Total	16898	14556	12396	11497

Source: Kaneshie polyclinic RCH Unit database.

Table 7, shows three-month performance coverage for Penta 3, MR1, MR2 and Men A for 2019. About 86 children were vaccinated for MR1 which were missed for Penta 3. MR 2 and Men A recorded no difference which is ideal.

Table 7: Okaikoi Submetro first year of life vaccination coverages and second year of life indicators for the first quarter 2019.

Months	Penta 3	MR1	MR2	Men A
January	1235	1258	1220	1220
February	1225	1195	1151	1151
March	501	594	529	529
Total	2961	3047	2900	2900

Source: Kaneshie polyclinic RCH Unit database.

The figure 3, below shows percentage annual performance of Penta 3, MR1, MR2 and Men A for 2017 and 2018. Penta 3 achieved the annual target set of 100% for the two years but there was an increase in performance 2018 than 2017. MR1 coverages for 2017 could not meet the target of 95% set but 2018 has increased in performance more than the target. 2018 performance for MR2 is better than the previous year 2107 but both could not achieve the annual target. Men A performance was worse performing indicator in both years with coverage below 70%.



Figure 3: Okaikoi Submetro annual percentage performance for some antigens for 2017 and 2018.

Figure 4, below shows three years first quarters coverage performance of the expected 25% coverages to achieve the annual target of 100%. 2019 performed poorly as compared with the previous two years in all indicators. To achieve the annual target for Penta 3, MR1, MR2 and Men A, Submetro need to make up for about 14% in the rest of quarters left and maintain at least 25% coverages for the rest three quarters. The 2018 year performed better in all indicators as compared with the rest of the years but could not meet the target of 25% for MR2 and Men A.

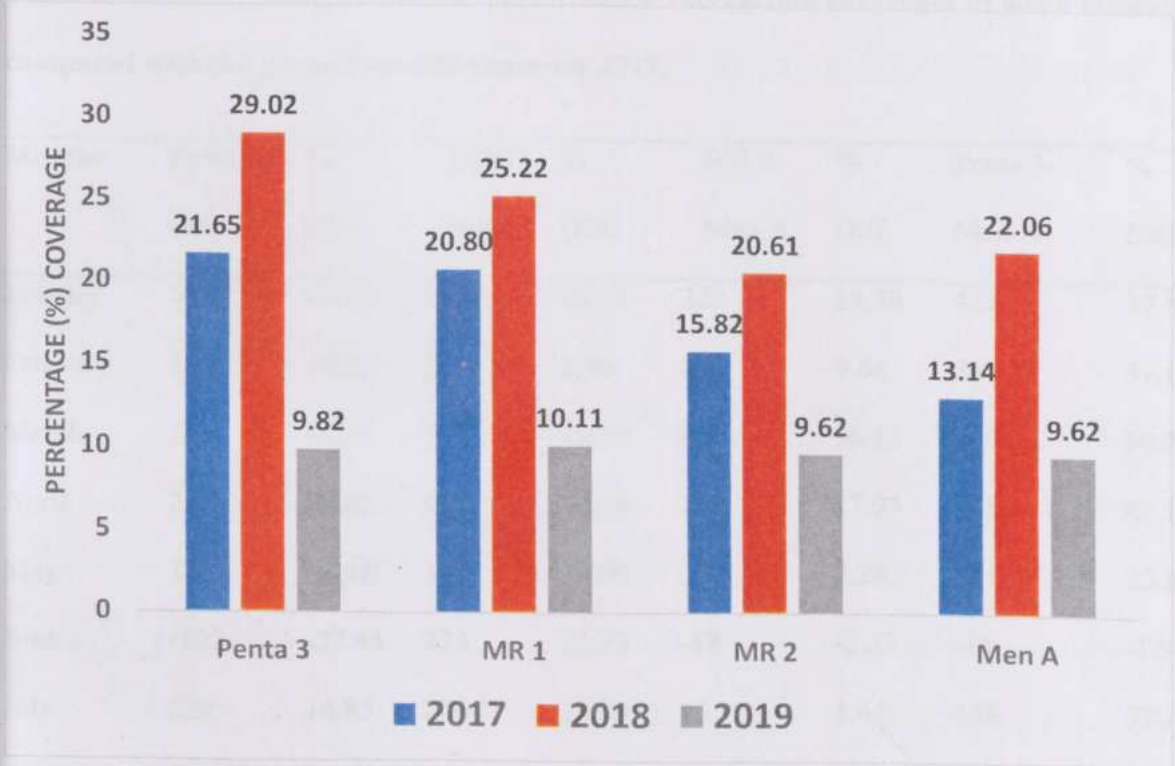


Figure 4: Okaikoi Submetro annual percentage performance for some antigens for first the quarter of 2017 to 2019.

Table 8: Okaikoi Submetro annual performance vaccination coverages of some indicators compared with the percentage difference for 2017.

Months	Penta 3-	%	MR 1-	%	MR 2-	%	Penta 3-	%
	MR 1	Diff.	MR 2	Diff.	Men A	Diff.	Men A	Diff.
January	-35	-3.16	247	21.63	220	24.58	432	39.02
February	189	16.32	87	8.98	85	9.64	361	31.17
March	-30	-3.38	391	42.59	85	16.13	446	50.23
April	218	20.02	90	10.33	140	17.93	448	41.14
May	164	11.46	152	12.00	25	2.24	341	23.83
June	-222	-27.44	224	21.73	-18	-2.23	-16	-1.98
July	227	16.85	206	18.39	15	1.64	448	33.26
August	160	10.40	267	19.38	-13	-1.17	414	26.92
September	103	7.09	275	20.37	191	17.77	569	39.16
October	146	9.93	206	15.55	332	29.67	684	46.50
November	300	20.89	136	11.97	43	4.30	479	33.36
December	243	18.34	108	9.98	133	13.66	484	36.53

Table 8, above shows monthly differences in some indicators which are expected to be within 0 to 10%. The differences that shows negative are not expected since some were given the same time or day. Penta 3 against MR 1 highest negative coverage was in June with 27.44%, the highest positive coverage of 20.89% in November and months of September and October recorded as expected 7.09% and 9.93% respectively. The highest difference in MR 1 against MR 2 was in March with 42.49%, there were no negative recorded and only February and

December normal of 8.98% and 9.98% respectively. The difference in MR 2 and Men A shows 2 negatives with highest in June -2.23%, October been highest positive 29.67% and three months below 10%.

Table 9: Okaikoi Submetro annual performance vaccination coverages of some indicators compared with the percentage difference for 2018.

Months	Penta 3-	% Diff.	MR 1-MR 2	% Diff.	MR 2-	% Diff.	Penta 3-	% Diff.
	MR 1				Men A		Men A	
January	154	10.74	233	18.20	-4	-0.38	383	26.71
February	128	9.29	223	17.84	-200	-19.47	151	10.96
March	286	18.80	232	18.79	-12	-1.20	506	33.27
April	300	19.34	179	14.31	166	15.49	645	41.59
May	194	12.67	185	13.84	238	20.66	617	40.30
June	340	22.99	150	13.17	389	39.33	879	59.43
July	294	20.78	255	22.75	116	13.39	665	47.00
August	397	24.72	237	19.60	17	1.75	651	40.54
September	127	9.53	198	16.42	-14	-1.39	311	23.33
October	206	15.54	91	8.13	72	7.00	369	27.83
November	-25	-2.13	80	6.68	131	11.73	186	15.87
December	-59	-5.12	97	8.01	0	0.00	38	3.30

Table 9, above shows almost the same pattern as table 6 with differences not within 0 to 10% for most of the months. The annual difference between MR 2 and Men A was 5401 representing

31.96% which were expected to be zero (0). The highest difference was seen in June for Penta 3 and Men A with 59.43%.

Table 50: Okaikoi Submetro annual performance vaccination coverages of some indicators compared with the percentage difference for the first quarter of 2019.

Months	Penta 3-	% Diff.	MR 1-	% Diff.	MR 2-	% Diff.	Penta 3-	% Diff.
	MR 1		MR 2		Men A		Men A	
January	-23	-1.86	38	3.02	0	0.00	15	1.21
February	30	2.45	44	3.68	0	0.00	74	6.04
March	-93	-18.56	65	10.94	0	0.00	-28	-5.59

Table 10, above shows first quarter 2019 differences which MR2 and Men A achieved expected Zero (0) for the three months. The difference between Penta 3 and MR1 for the first quarter was -2.90 which did not fall in expected 0 to 10%.

Table 11: Okaikoi Submetro Area annual performance vaccination coverages of some indicators compared with the target population for 2017.

AREAS	Target Pop.	Penta 3	MR1	MR2	Men A
ABEKA	3975	5027	4389	3846	3357
ACH OUT'RCH	1499	1504	1597	1097	1053
AKWETEMAN	874	535	582	476	426
KANESHIE	2787	3913	3230	2801	2378
TESANO	1078	492	432	376	329
ACHIMOTA HOSP	1101	1616	1255	947	979
KANESHIE P/C	1874	1171	754	488	419
APENKWA CHPS	204	135	180	159	192
OTHER CHPS	1171	996	1169	1010	829
OKAIKOI	14561	15389	13588	11200	9962

Table 11, above shows areas target expected performance as compared with their actual annual coverage for 2017. The annual expected children to vaccinate in achieving 100% was 14561 and achieved by exceeding with 828 for Penta 3. The MR1 missed 973 children, MR2 missed 3361 children and Men A missed more children than all for the review year indicators with 4599.

Table 62: Okaikoi Submetro Area annual performance vaccine coverages of some indicators compared with the target population for 2018.

AREAS	Target Pop.	Penta 3	MR1	MR2	Men A
KANESHIE 1 & 2 CHPS	672	237	426	389	448
BUBIASHIE CHPS	1567	898	1040	940	989
NORTH KANESHIE	1344	1257	1426	1290	1252
*KPC STATIC	896	1356	959	702	642
ABEKA CHPS	1433	858	1000	896	893
FADAMA CHPS	1344	2887	1970	1667	1522
NIIBOI CHPS	1702	4367	2742	2687	2138
AKWETEMAN CHPS	746	545	650	564	531
*ACH. NS. RD. CHPS	672	530	597	483	506
*ACH. HOSP CHPS	1344	677	882	640	541
ACHIMOTA STATIC	2463	2219	1651	1091	1188
TESANO CHPS	291	684	564	491	408
AVENOR CHPS	351	197	261	211	167
APENKWA CHPS	105	184	167	188	178
OKAIKOI	14930	16896	14335	12239	11403

*KPC- Kaneshie Polyclinic, ACH. NS. RD. -Achimota Nsawam Road, ACH HOSP-Achimota Hospital.

Table 12, above shows expected annual target of 14930 which MR1, MR2 and Men A could not achieve the target but Penta 3 exceeded the target with 1966. MR1 missed 595 children not vaccinated for the year reviewed. Children missed for MR2 were 2691 and 3527 for Men A.

Table 73: Okaikoi Submetro Area annual performance vaccination coverages of some indicators compared with the target population from January to March, 2019.

AREAS	Target Pop.	Penta 3	MR1	MR2	Men A
KANESHIE 1 & 2 CHPS	689	50	142	161	161
BUBIASHIE CHPS	1607	226	286	288	288
NORTH KANESHIE CHPS	1377	329	344	408	408
KANESHIE ZONE	3673	605	772	857	857
KPC STATIC	918	394	268	226	226
ABEKA CHPS	1468	175	283	250	250
FADAMA CHPS	1378	288	272	250	250
NIIBOI CHPS	1745	607	469	454	454
ABEKA ZONE	4591	1070	1024	954	954
AKWETEMAN CHPS	765	207	187	172	172
ACH NS RD CHPS	689	84	117	86	86
KISSIEMAN CHPS	230	10	15	17	17
*CHRIST. VILLAGE CHPS	230	8	15	16	16
ABOFU CHPS	2981	10	12	10	10
ANUMLE CHPS	0	10	21	10	10
ACHIMOTA CHPS	3441	38	63	53	53
ACH HOSP STATIC	765	356	361	296	296
APENKWA CHPS	0	32	52	48	48
TESANO CHPS	15302	140	128	130	130
AVENOR CHPS	0	35	75	78	78
TESANO ZONE	15302	207	255	256	256
OKAIKOI	30144	4881	5161	5020	5020

*CHRIST. VILLAGE – Christian Village.

Table 13, above shows annual target children to be vaccinated at 30144. The quarterly expected coverage was 7536 all the indicators for review could not achieve. Penta 3 children missed was

2655, MR1 missed children was 2375 and MR2 and Men A missed a same number of children 2516.

Table 14, below shows monthly expected children for vaccination as 331, weekly 83 and daily 28 for MR2 and Men A. The Abeka area achieved 95% target of children vaccinated for MR2 (3842) representing 96.65% and could not achieve same for Men A (3357) children vaccinated representing 84.45%.

Table 84: Abeka Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	331	83	28	272	82.18	192	58.01
February	331	83	28	323	97.58	323	97.58
March	331	83	28	62	18.73	62	18.73
April	331	83	28	246	74.32	191	57.70
May	331	83	28	364	109.97	338	102.11
June	331	83	28	271	81.87	265	80.06
July	331	83	28	382	115.41	362	109.37
August	331	83	28	445	134.44	445	134.44
September	331	83	28	350	105.74	273	82.48
October	331	83	28	335	101.21	274	82.78
November	331	83	28	413	124.77	314	94.86
December	331	83	28	379	114.50	318	96.07

MTP- Monthly target population, WTP-Weekly target population, DTP-Daily target population

Table 15, below shows the monthly target of 125, the weekly target of 31 and the daily target of 10 for children vaccination in Achimota Outreach area. The area could not achieve a 95% target for the year. They vaccinated 1097 children for MR2 representing 73.18% and for Men A vaccinated 1053 children representing 70.25%.

Table 95: Achimota Outreach Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	125	31	10	117	93.60	106	84.80
February	125	31	10	92	73.60	111	88.80
March	125	31	10	60	48.00	51	40.80
April	125	31	10	107	85.60	98	78.40
May	125	31	10	113	90.40	93	74.40
June	125	31	10	119	95.20	113	90.40
July	125	31	10	72	57.60	72	57.60
August	125	31	10	88	70.40	97	77.60
September	125	31	10	87	69.60	82	65.60
October	125	31	10	95	76.00	76	60.80
November	125	31	10	87	69.60	111	88.80
December	125	31	10	60	48.00	43	34.40

Table 16, below shows Akweteman Area expected children for vaccination monthly 73, weekly 18 and daily 6 to achieve the annual target. They could not achieve the set target for various

months. They vaccinated 476 for MR2 representing 54.48% and vaccinated 426 for Men A representing 48.76% for the year.

Table 106: Akweteman Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	73	18	6	58	79.45	27	36.99
February	73	18	6	34	46.58	39	53.42
March	73	18	6	46	63.01	46	63.01
April	73	18	6	34	46.58	34	46.58
May	73	18	6	48	65.75	48	65.75
June	73	18	6	36	49.32	36	49.32
July	73	18	6	28	38.36	28	38.36
August	73	18	6	30	41.10	30	41.10
September	73	18	6	31	42.47	22	30.14
October	73	18	6	51	69.86	43	58.90
November	73	18	6	38	52.05	32	43.84
December	73	18	6	42	57.53	41	56.16

Table 17, shows Kaneshie Area monthly coverage of 232, weekly 58 and daily 19 to achieve the annual target. They were able to achieve 100% and more for the month of May, September, October and December. They achieved the target for MR2 by vaccinating 2801 children representing 100.51% but could not for Men A by vaccinating 2378 children representing 85.33%.

Table 117: Kaneshie Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	232	58	19	210	90.52	153	65.95
February	232	58	19	231	99.57	145	62.50
March	232	58	19	180	77.59	146	62.93
April	232	58	19	157	67.67	134	57.76
May	232	58	19	263	113.36	289	124.57
June	232	58	19	181	78.02	205	88.36
July	232	58	19	221	95.26	229	98.71
August	232	58	19	229	98.71	229	98.71
September	232	58	19	335	144.40	282	121.55
October	232	58	19	350	150.86	153	65.95
November	232	58	19	210	90.52	210	90.52
December	232	58	19	234	100.86	203	87.50

Table 18, below enumerated the monthly target of 90 children, the weekly target of 23 children and the daily target of 8 children when vaccinated by Tesano Area will achieve the set target of 95% for the year. They were able to vaccinate 376 children for MR2 representing 34.89% and for Men A vaccinated 329 children representing 30.53%.

Table 128: Tesano Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	90	23	8	33	36.67	21	23.33
February	90	23	8	24	26.67	24	26.67
March	90	23	8	17	18.89	17	18.89
April	90	23	8	22	24.44	22	24.44
May	90	23	8	35	38.89	28	31.11
June	90	23	8	23	25.56	23	25.56
July	90	23	8	34	37.78	29	32.22
August	90	23	8	43	47.78	43	47.78
September	90	23	8	31	34.44	4	4.44
October	90	23	8	25	27.78	20	22.22
November	90	23	8	50	55.56	57	63.33
December	90	23	8	39	43.33	41	45.56

Table 19, shows Achimota Hospital Area annual target coverage breakdown by monthly, weekly and daily 92,23 and 8 respectively. They were able to achieve 100% and above in some four months namely April, May, August and September. They were not able to achieve the set target by vaccinating 947 children representing 86.03% for MR2 and Men A vaccinated 979 (88.94).

Table 19: Achimota Hospital Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	92	23	8	70	76.09	80	86.96
February	92	23	8	80	86.96	80	86.96
March	92	23	8	40	43.48	40	43.48
April	92	23	8	97	105.43	97	105.43
May	92	23	8	140	152.17	150	163.04
June	92	23	8	58	63.04	57	61.96
July	92	23	8	58	63.04	74	80.43
August	92	23	8	100	108.70	100	108.70
September	92	23	8	100	108.70	100	108.70
October	92	23	8	76	82.61	73	79.35
November	92	23	8	59	64.13	59	64.13
December	92	23	8	69	75.00	69	75.00

Table 20, shows Kaneshie Polyclinic Area monthly performance for the second year of life vaccination. The monthly children vaccinated 156, weekly 39 and daily 13 could make the area achieve set target for the year. They were able to vaccinate 488 (26.04%) children for MR2 and 419 (22.36%) for Men A as annual coverage.

Table 130: Kaneshie Polyclinic Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	156	39	13	53	33.97	27	17.31
February	156	39	13	27	17.31	27	17.31
March	156	39	13	49	31.41	49	31.41
April	156	39	13	34	21.79	20	12.82
May	156	39	13	36	23.08	36	23.08
June	156	39	13	28	17.95	31	19.87
July	156	39	13	16	10.26	8	5.13
August	156	39	13	70	44.87	75	48.08
September	156	39	13	33	21.15	24	15.38
October	156	39	13	44	28.21	32	20.51
November	156	39	13	43	27.56	49	31.41
December	156	39	13	55	35.26	41	26.28

Table 21, below shows Apenkwa CHPS Area monthly performance for the second year of life vaccines. It was expected that for every CWC session in the month they will vaccinate 17 children, 4 children weekly and 1 child a day. They could not achieve the target of 95% but Men A was close with 94.19% by vaccinating 192 children and MR2 children vaccinated were 159 (78%).

Table 141: Apenkwa Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	17	4	1	18	105.88	18	105.88
February	17	4	1	8	47.06	8	47.06
March	17	4	1	9	52.94	9	52.94
April	17	4	1	18	105.88	18	105.88
May	17	4	1	14	82.35	12	70.59
June	17	4	1	9	52.94	17	100.00
July	17	4	1	7	41.18	8	47.06
August	17	4	1	14	82.35	15	88.24
September	17	4	1	18	105.88	18	105.88
October	17	4	1	24	141.18	31	182.35
November	17	4	1	12	70.59	26	152.94
December	17	4	1	8	47.06	12	70.59

Table 22, shows Other CHPS Area monthly coverage for MR2 and Men A. The area was expected to vaccinate 98 children monthly, vaccinate 25 children monthly and vaccinate 8 children daily to achieve at least 95% coverage. They vaccinated 829(70.81%) children for Men A and vaccinated 1010 (86.27%) children for MR2.

Table 22: Other Area second year of life vaccination coverages compared with the monthly target population, showing the weekly and the daily target for 2017.

Months	MTP	WTP	DTP	MR 2	% COV	Men A	% COV
January	98	25	8	60	61.22	51	52.04
February	98	25	8	63	64.29	40	40.82
March	98	25	8	64	65.31	22	22.45
April	98	25	8	66	67.35	27	27.55
May	98	25	8	102	104.08	96	97.96
June	98	25	8	82	83.67	78	79.59
July	98	25	8	96	97.96	89	90.82
August	98	25	8	92	93.88	90	91.84
September	98	25	8	90	91.84	79	80.61
October	98	25	8	119	121.43	85	86.73
November	98	25	8	88	89.80	99	101.02
December	98	25	8	88	89.80	73	74.49

Table 23, shows below a breakdown of the target population for Okaikoi Submetro for 2019 at the end of the year to vaccinate 30144 children with Measles-Rubella second doses and Conjugate Meningococcal A vaccine to achieve 100% coverage. The estimated target population were not given to three of the areas namely Anumle CHPS, Apenkwa CHPS and Avenor CHPS zones. The target for monthly children to be vaccinated is 2512, the weekly target is 628 and the daily target is 209. The Okaikoi Submetro holds at least 14 Child Welfare Clinics a day in

various areas which needed 15 children vaccinated at all site if the population is the same. The variation in the population of areas shows least target for a day is 2 and highest is 21.

Table 153: Areas and Zones second year of life population breakdown for Okaikoi Submetro by annual, monthly, weekly and daily target population for 2019

Areas	ATP	MTP	WTP	DTP
KANESHIE 1 & 2 CHPS	689	57	14	5
BUBIASHIE CHPS	1607	134	33	11
NORTH KANESHIE CHPS	1377	115	29	10
KANESHIE ZONE	3673	306	77	26
KPC STATIC	918	77	19	6
ABEKA CHPS	1468	122	31	10
FADAMA CHPS	1378	115	29	10
NIIBOI CHPS	1745	145	36	12
ABEKA ZONE	4591	383	96	32
AKWETEMAN CHPS	765	64	16	5
ACH NS RD CHPS	689	57	14	5
KISSIEMAN CHPS	230	19	5	2
CHRISTIAN VILLAGE CHPS	230	19	5	2
ABOFU CHPS	2981	248	62	21
ANUMLE CHPS	0	0	0	0
ACHIMOTA ZONE	3441	287	72	24
ACH HOSP STATIC	765	64	16	5
APENKWA CHPS	0	0	0	0
TESANO CHPS	15302	1275	319	106
AVENOR CHPS	0	0	0	0
TESANO ZONE	15302	1275	319	106
OKAIKOI	30144	2512	628	209

Source: RCH Unit, Kaneshie polyclinic

Table 24, below shows 2019 first-quarter performance for the second year of life vaccines by month. The zone was able to vaccinate 857 (93.33%) for MR2 and Men A which fall short of 1.67% in achieving the target of 95%. North Kaneshie CHPS was able to achieve 100% and above within the areas. They were no differences between MR2 and Men A as an ideal.

Table 164: Kaneshie zone performance coverage for the second year of life vaccines from January to March, 2019.

AREAS/ ZONES	Indicators	January	February	March	First Quarter
Kaneshie 1 & 2 CHPS	MR 2	60	64	37	161
	% COV	104.50	111.47	64.44	93.47
	Men A	60	64	37	161
	% COV	104.50	111.47	64.44	93.47
BUBIASHIE CHPS	MR 2	94	95	99	288
	% COV	70.19	70.94	73.93	71.69
	Men A	94	95	99	288
	% COV	70.19	70.94	73.93	71.69
NORTH KANESHIE CHPS	MR 2	91	170	147	408
	% COV	79.30	148.15	128.10	118.52
	Men A	91	170	147	408
	% COV	79.30	148.15	128.10	118.52
KANESHIE ZONE	MR 2	245	329	283	857
	% COV	80.04	107.49	92.46	93.33
	Men A	245	329	283	857
	% COV	80.04	107.49	92.46	93.33

Table 25, Abeka zone shows no differences in children expected to be vaccinated same day for MR2 and Men A but could not achieve the target of 95% and above. They vaccinated 1180

(85.68%) children but Kaneshie Polyclinic Static and Nii Boi CHPS was able to achieve the above set target of 95%.

Table 175: Abeka Zone second year of life vaccination coverage for the first quarter of 2019.

AREAS/ ZONES	Indicators	January	February	March	First Quarter
KPC STATIC	MR 2	99	75	52	226
	% COV	129.41	98.04	67.97	98.47
	Men A	99	75	52	226
	% COV	129.41	98.04	67.97	98.47
ABEKA CHPS	MR 2	87	76	87	250
	% COV	71.12	62.13	71.12	68.12
	Men A	87	76	87	250
	% COV	71.12	62.13	71.12	68.12
FADAMA CHPS	MR 2	115	135	0	250
	% COV	100.15	117.56	0.00	72.57
	Men A	115	135	0	250
	% COV	100.15	117.56	0.00	72.57
NIIBOI CHPS	MR 2	256	198	0	454
	% COV	176.05	136.16	0.00	104.07
	Men A	256	198	0	454
	% COV	176.05	136.16	0.00	104.07
ABEKA ZONE	MR 2	557	484	139	1180
	% COV	121.33	105.43	30.28	85.68
	Men A	557	484	139	1180
	% COV	121.33	105.43	30.28	85.68

Table 26, shows Achimota CHPS performance for the first quarter of 2019. All the areas performed below the set target which the zone vaccinated 311(25.41%) children for the three

month. Four areas did not report any child vaccinated for January and March namely Kissieman CHPS, Christian Village CHPS, Abofu CHPS and Anumle CHPS.

Table 186: Achimota CHPS Zone second year of life vaccination coverage for the first quarter of 2019.

AREAS/ ZONES	Indicators	January	February	March	First Quarter
AKWETEMAN CHPS	MR 2	92	80	0	172
	% COV	144.31	125.49	0.00	89.93
	Men A	92	80	0	172
	% COV	144.31	125.49	0.00	89.93
ACH NS RD CHPS	MR 2	55	31	0	86
	% COV	95.79	53.99	0.00	49.93
	Men A	55	31	0	86
	% COV	95.79	53.99	0.00	49.93
KISSIEMAN CHPS	MR 2	0	17	0	17
	% COV	0.00	88.70	0.00	88.70
	Men A	0	17	0	17
	% COV	0.00	88.70	0.00	88.70
X'VILLAGE CHPS	MR 2	0	16	0	16
	% COV	0.00	83.48	0.00	83.48
	Men A	0	16	0	16
	% COV	0.00	83.48	0.00	83.48
ABOFU CHPS	MR 2	0	10	0	10
	% COV	0.00	4.03		4.03
	Men A	0	10	0	10
	% COV	0.00	4.03		4.03
ANUMLE CHPS	MR 2	0	10	0	10
	% COV				0
	Men A	0	10	0	10
	% COV				0
ACHIMOTA CHPS	MR 2	147	164	0	311
	% COV	36.04	40.20	0.00	25.41
	Men A	147	164	0	311
	% COV	36.04	40.20	0.00	25.41

Table 27, shows Tesano performance for the first three months of the year reveals serious action needed to be taken immediately to even achieve 85% coverage at the end year. Achimota Hospital Static was able to 100% and coverage but Tesano zone vaccinated 552 (13.74%) children.

Table 197: Tesano Zone second year of life vaccination coverage for the first quarter of 2019.

AREAS/ ZONES	Indicators	January	February	March	First Quarter
ACH HOSP STATIC	MR 2	175	121	0	296
	% COV	274.51	189.80	0.00	154.77
	Men A	175	121	0	296
	% COV	274.51	189.80	0.00	154.77
APENKWA CHPS	MR 2	11	10	27	48
	% COV				0
	Men A	11	10	27	48
	% COV				0
TESANO CHPS	MR 2	58	35	37	130
	% COV	4.55	2.74	2.90	3.40
	Men A	58	35	37	130
	% COV	4.55	2.74	2.90	3.40
AVENOR CHPS	MR 2	27	8	43	78
	% COV				0
	Men A	27	8	43	78
	% COV				0
TESANO ZONE	MR 2	271	174	107	552
	% COV	20.24	13.00	7.99	13.74
	Men A	271	174	107	552
	% COV	20.24	13.00	7.99	13.74

4.2 Service Providers Factors

Immunization activities all over the world use various strategies to get children vaccinated. Responses from respondents show various strategies, knowledge and practice used in the two zones in the second year of life vaccination. The following table below summarises the respective responses.

Table 208: Summary staff responses on questionnaires given them for the three months of data collection period April to June 2019.

	N (%)	
	No	Yes
Know of 2 nd Year of Life policy	51 (30.2)	118 (69.8)
Know of 2 nd Year of Life catch up policy	70 (41.4)	99 (58.6)
Have 2 nd Year of Life catch up policy	75 (44.4)	94 (55.6)
Schedule clients for next visit	28 (16.6)	141 (83.4)
Go for outreach	102 (60.4)	67 (39.6)
Schedule clients for the second year of life vaccination after given 9 months vaccines	111 (65.7)	58 (34.3)
Get to work or outreach point late	55 (32.5)	114 (67.5)
Know Monthly Target Population	74 (43.8)	95 (56.2)
Know Daily Target Population	142 (84.0)	27 (16.0)
Analyse data daily	129 (76.3)	40 (23.7)
Receive feedback from supervisors after submitting reports	117 (69.2)	52 (30.8)
Have a shortage of Men A Vaccines	6 (3.6)	163 (96.4)
Have a shortage of MR Vaccines	6 (3.6)	163 (96.4)
Have an adequate sitting facility	102 (60.4)	67 (39.6)
Give adequate information	102 (60.4)	67 (39.6)
Vaccine administration done well	106 (62.7)	63 (37.3)
Do tallies immediately	118 (69.8)	51 (30.2)
Dispose of bottles appropriately	110 (65.1)	59 (34.9)

Table 29: Interviewer observation during the administering of questionnaires on site.

	N	%
Child welfare clinic site		
Not adequate	99	58.6
Adequate	70	41.4
Cold chain observation		
Not good	43	25.4
Good	126	74.6
Staff		
Not enough	92	54.4
Enough	77	45.6
Strategy being used		
Static	54	32.0
Outreach	103	61.0
Mobile	12	7.1
Number of outreach points		
Good	66	39.1
Fair	84	49.7
Not good	19	11.2
Total	169	100.0

For each of the factors below in table 30, differences are shown by how immediate tallying is done. For example, for the 99 staff who said child welfare clinic sites that were inadequate, 26 (26.3%) of them carried out tallying immediately compared to 25 (35.7%) of the 70 child welfare clinics considered adequate. These differences were not significant though as shown from the p-value (0.187). P-values below 0.05 are considered to show significant differences between categories been tested in relation to the outcome tallying. So in this case, significant differences in tallying are only seen for the number of outreach points and Schedule clients for the second

year of life vaccination after given 9 months vaccines. Fisher's exact test p-values are used in instances where frequencies are very low since they are more appropriate.

Table 210: Relationship between staff adequacy, other factors and immediate tallying

	Tallying, N (%)			Chi-square P-value
	Not immediate	Immediate	Total	
Child welfare clinic site				0.187
Not adequate	73 (73.7)	26 (26.3)	99 (100.0)	
Adequate	45 (64.3)	25 (35.7)	70 (100.0)	
Cold chain observation				0.447
Not good	32 (74.4)	11 (25.6)	43 (100.0)	
Good	86 (68.3)	40 (31.8)	126 (100.0)	
Staff				0.109
Not enough	69 (75.0)	23 (25.0)	92 (100.0)	
Enough	49 (63.6)	28 (36.4)	77 (100.0)	
Strategy being used				0.301 ^f
Static	42 (77.8)	12 (22.2)	54 (100.0)	
Outreach	68 (66.0)	35 (34.0)	103 (100.0)	
Mobile	8 (66.7)	4 (33.3)	12 (100.0)	
Number of outreach points				0.009 ^f
Good	51 (77.3)	15 (22.7)	66 (100.0)	
Fair	50 (59.5)	34 (40.5)	84 (100.0)	
Not good	17 (89.5)	2 (10.5)	19 (100.0)	
Schedule clients for the second year of life vaccination after given 9 months vaccines				0.003
No	69 (62.2)	42 (37.8)	111 (100.0)	
Yes	49 (84.5)	9 (15.5)	58 (100.0)	
Get to work or outreach point late				0.053
No	33 (60.0)	22 (40.0)	55 (100.0)	
Yes	85 (74.6)	29 (25.4)	114 (100.0)	
Total	118 (69.8)	51 (30.2)	169 (100.0)	

f: Fisher's exact p-value used instead due to some cell frequencies being low

Similar to the previous table, differences in terms of adequate information provided are shown for the same factors. In this case, significant differences are seen for Child welfare clinic site ($p=0.003$) and Staff ($p=0.007$).

Table 221: Relationship between staff adequacy, other factors and provision of adequate information

	Adequate information, N (%)			Chi-square P-value
	Not provided	Provided	Total	
Child welfare clinic site				0.003
Not adequate	69 (69.7)	30 (30.3)	99 (100.0)	
Adequate	33 (47.1)	37 (52.9)	70 (100.0)	
Cold chain observation				0.460
Not good	28 (65.1)	15 (34.9)	43 (100.0)	
Good	74 (58.7)	52 (41.3)	126 (100.0)	
Staff				0.007
Not enough	64 (69.6)	28 (30.4)	92 (100.0)	
Enough	38 (49.4)	39 (50.7)	77 (100.0)	
Strategy being used				0.200
Static	30 (55.6)	24 (44.4)	54 (100.0)	
Outreach	67 (65.1)	36 (34.9)	103 (100.0)	
Mobile	5 (41.7)	7 (58.3)	12 (100.0)	
Number of outreach points				0.450
Good	39 (59.1)	27 (40.9)	66 (100.0)	
Fair	49 (58.3)	35 (41.7)	84 (100.0)	
Not good	14 (73.7)	5 (26.3)	19 (100.0)	
Total	102 (60.4)	67 (39.6)	169 (100.0)	

The responses that constituted output were put together to generate a composite score by giving the desired response a score of '1' and '0' if otherwise in table 32. The resulting total score was then converted to the percentage scale. So for example, respondents that had 'Good' cold chain observations had an average Output score of 49.4%, a bit higher than those without good cold chain observation who had an output score of 47.2%.

Table 232: Differences in some observations

	Mean	SD
Child welfare clinic site		
Not adequate	42.9	13.0
Adequate	57.3	20.4
Cold chain observation		
Not good	47.2	16.5
Good	49.4	18.3
Staff		
Not enough	44.8	12.4
Enough	53.8	21.8
Strategy being used		
Static	53.9	20.7
Outreach	43.4	12.0
Mobile	73.3	20.6
Number of outreach points		
Good	53.9	19.3
Fair	44.6	14.8
Not good	50.0	21.3
Total	48.9	17.9

The mean differences in output levels between facilities in terms of shortage of Men A and MR vaccines are shown below in Table 33. The same facilities which could be CHPS compound or

outreach points that had a shortage of Men A also had the shortage of MR vaccines and so the same results can be used for both vaccine types. The facilities without shortage had a mean output level of 23.3% compared to the mean output level of 49.8% for those with shortage and this difference was highly significant ($p < 0.001$).

Table 243: Differences in output levels and shortage of Men A and MR vaccines

	No.	S.E.	S.D.	Mean	95% C.I. for Mean		Wilcoxon Rank Sum
Vaccines							
No shortage	6	2.11	5.16	23.3	17.9	28.8	$z = -4.06$
Had shortage	163	1.37	17.48	49.8	47.1	52.5	$p < 0.001$
Combined	169	1.38	17.88	48.9	46.2	51.6	
Difference		2.51		-26.48	-32.08	-20.89	

Fisher's exact test p-values were used to compare if significant difference exists in terms of shortages of the vaccines for facilities that know or did not know 2nd Year of Life (and catch up) policies in table 34. All facilities that know the policies also had a shortage of the vaccines compared to only some of those that didn't know the policies and these differences were significant as seen from the p-values. Fisher's exact test p-values are used due to the low frequencies in some cells. But care must be taken in explaining this so it does not seem as if it is the absence of knowledge of the policies that are entirely to blame for the shortages. The same facilities had a shortage of Men A and MR vaccines and so the same results can be used in both cases.

Table 254: Differences in output and input (vaccine shortages and 2nd Year of Life policy)

	Men A/MR vaccine			Fisher's exact P-value
	No shortage	Had shortage	Total	
2nd Year of Life policy				<0.001
Didn't Know	6 (11.8)	45 (88.2)	51 (100.0)	
Did Know	0	118 (100.0)	118 (100.0)	
2nd Year of Life catch up policy				0.007
Didn't Know	6 (8.0)	69 (92.0)	75 (100.0)	
Did Know	0	94 (100.0)	94 (100.0)	
Total	6 (3.6)	163 (96.5)		

4.3 Health facility factors

4.3.1 Vaccine availability and adequacy

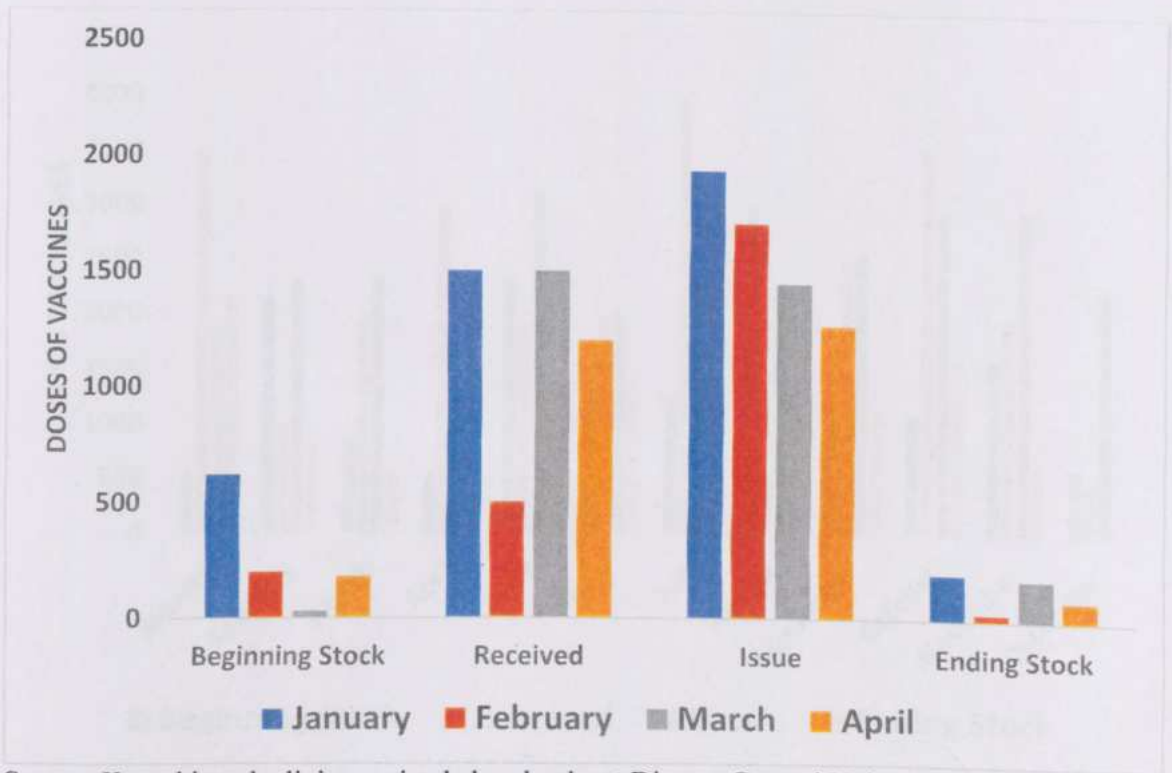
Vaccine levels found at Kaneshie Polyclinic are shown below.



Source: Kaneshie polyclinic vaccine ledger books at Disease Control Unit.

Figure 5: Monthly availability of Conjugate A Meningococcal vaccines in Okaikoi Sub metro for 2017.

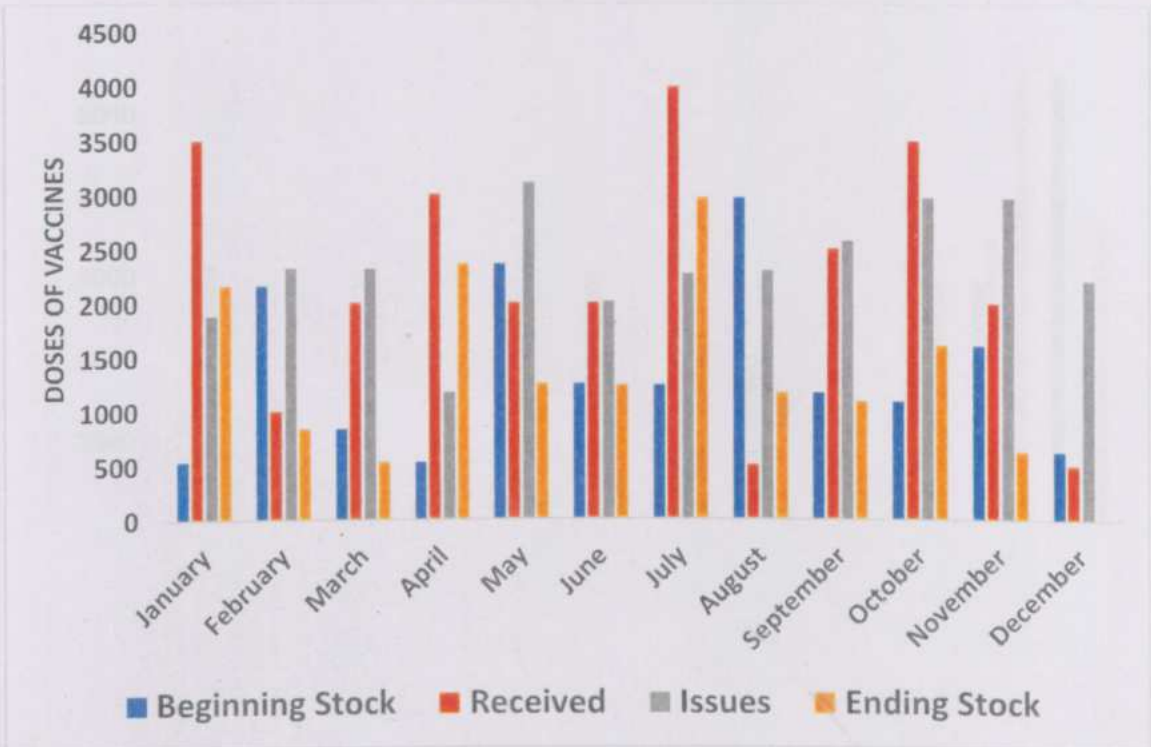
Figure 5, shows how Kaneshie Polyclinic receive and serves vaccines as the Submetro cold room from where all facilities collect their vaccine requirements. The annual stock level expected was 19643 and they achieved 19290, expected monthly stock level 1637 with an expected minimum stock level of 409 and maximum stock level 2046. Average monthly consumption was 1607.5 indicating adequate monthly availability. The beginning stock reveals quite a shortage of vaccine before restocking for four months from September to December.



Source: Kaneshie polyclinic vaccine ledger books at Disease Control Unit.

Figure 7: Monthly availability of Conjugate A Meningococcal vaccines in Okaikoi Sub metro for the first four months in 2019.

The average monthly consumption was 1592.5 indicating adequate monthly availability for the four months in 2019. The beginning stock reveals delay in restocking of vaccines especially in March which resulted in quite shortage. The annual stock level expected was 40664 and they achieved 6370, expected monthly stock level 3389 with an expected minimum stock level of 847 and maximum stock level 4236.



Source: Kaneshie polyclinic vaccine ledger books at Disease Control Unit.

Figure 8: Monthly availability of Measles-Rubella vaccines in Okaikoi Sub metro for 2017.

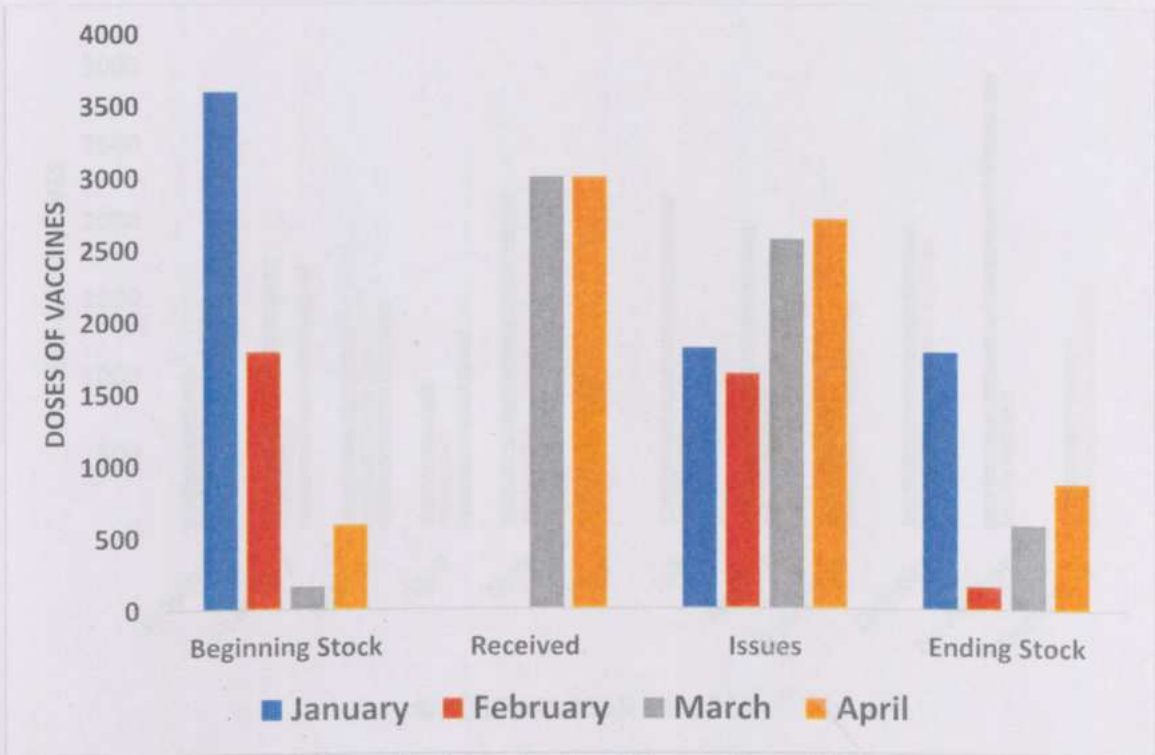
Kaneshie Polyclinic serves as the Submetro cold room from where all facilities collect their Measles-Rubella vaccine requirements. The annual stock level expected was 39286 and they achieved 28130, expected monthly stock level 3274 with an expected minimum stock level of 818 and maximum stock level 4092. Average monthly consumption was 2344.2 indicating adequate monthly availability.



Source: Kaneshie polyclinic vaccine ledger books at Disease Control Unit.

Figure 9: Monthly availability of Measles-Rubella vaccines in Okaikoi Sub metro for 2018.

The average monthly consumption was 1912.5 indicating adequate monthly availability. The beginning stock reveals a shortage of vaccine for some days before restocking. The annual stock level expected was 40281 and they achieved 22950, expected monthly stock level 3357 with an expected minimum stock level of 839 and maximum stock level 4196.



Source: Kaneshie polyclinic vaccine ledger books at Disease Control Unit.

Figure 10: Monthly availability of Measles-Rubella vaccines in Okaikoi Sub metro for first four months in 2019.

The average monthly consumption was 2180 indicating adequate monthly availability for the four months in 2019. The beginning stock reveals delay in restocking of vaccines especially in March which resulted in quite a shortage. The annual stock level expected was 40281 and they achieved 8720, expected monthly stock level 3357 with an expected minimum stock level of 839 and maximum stock level 4236.

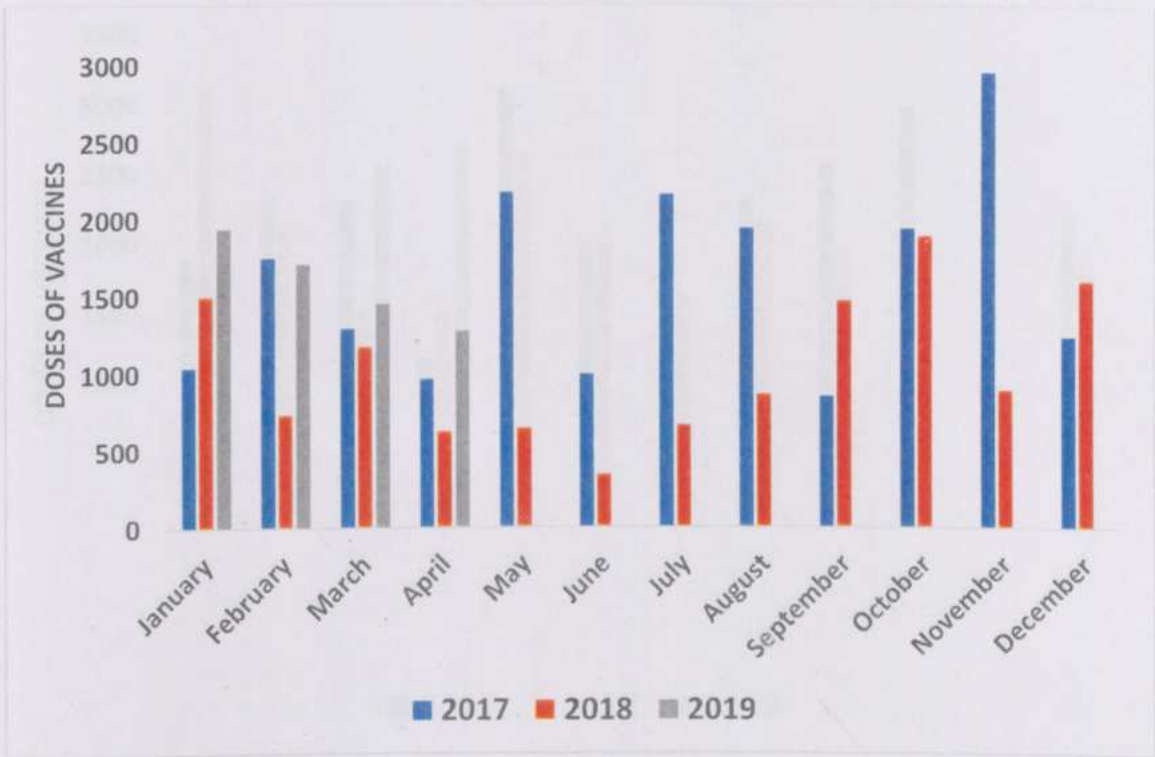


Figure 11: Shows Conjugate A Meningococcal vaccines in Okaikoi Sub metro for various months in 2017, 2018 and the first four months of 2019.

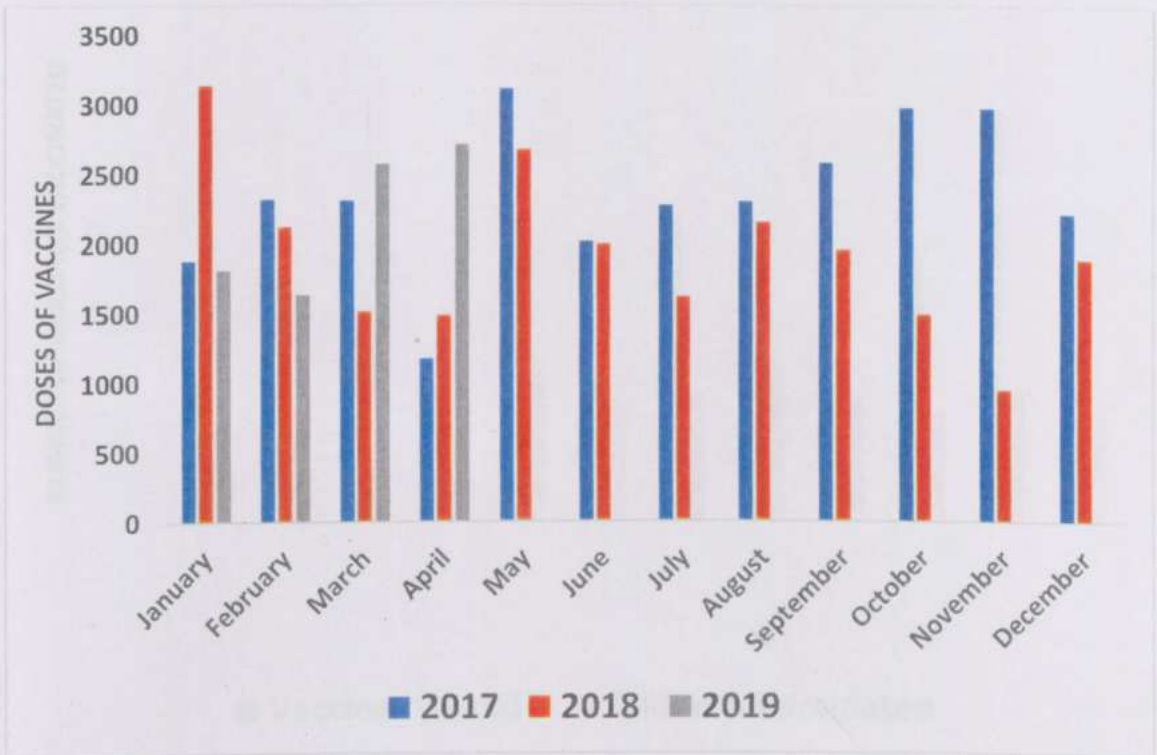


Figure 12: Shows Measles-Rubella vaccines in Okaikoi Sub metro for various months in 2017, 2018 and the first four months of 2019.

Figure 11 and 12 show vaccines distributed from Kaneshie polyclinic to facilities. The distribution in 2017 is higher than in 2018 by 35.87% for Men A and 18.42% for MR yet there was a shortage in 2017. The shortage is due to late receiving of stock within the month but not for the entire month. The first four months of 2019 stock level has seen some significant improvement over the previous years by 5.39% same time.

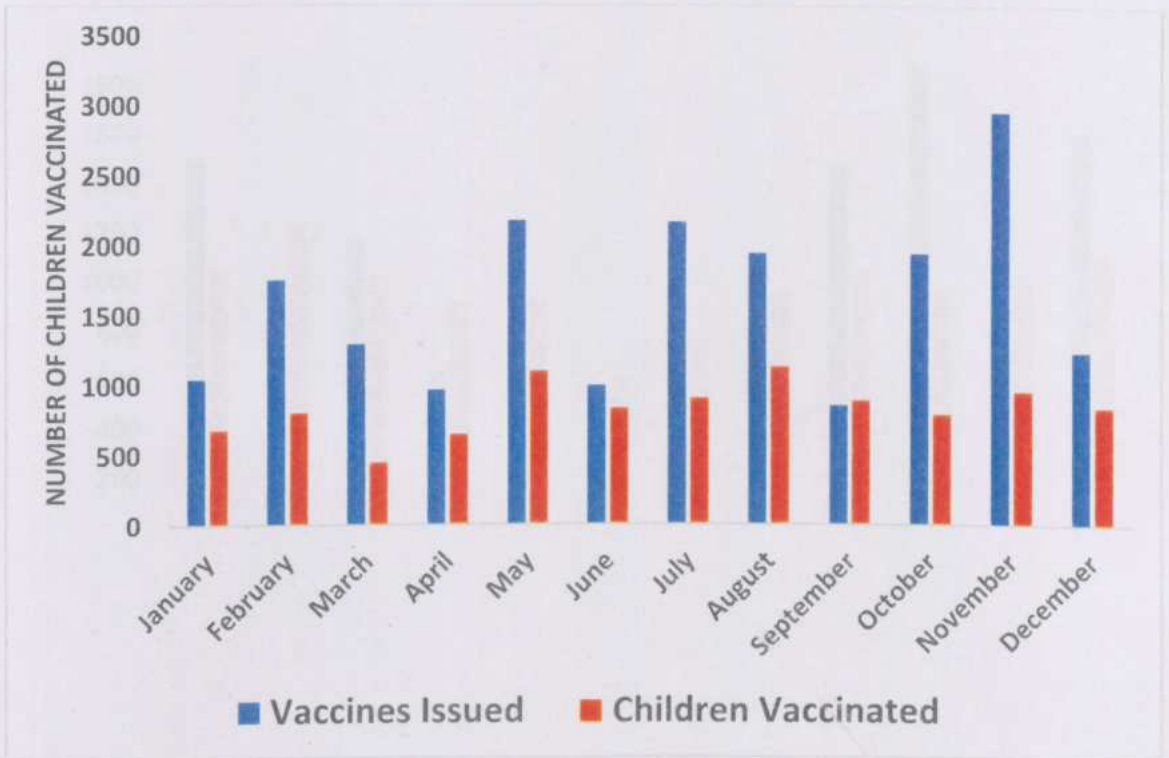


Figure 13: shows Okaikoi Submetro Conjugate A Meningococcal vaccines issued as compared with the children vaccinated for 2017.

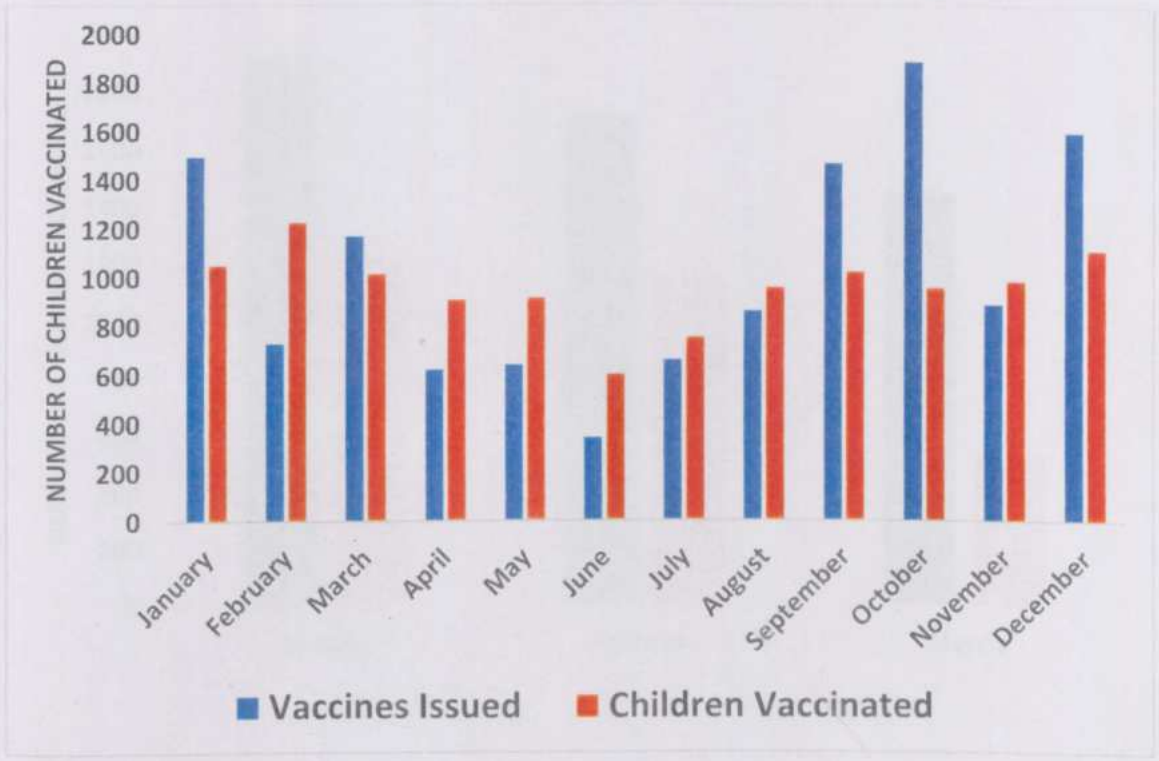


Figure 14: Differences in Okaikoi Submetro Conjugate A Meningococcal vaccines issued as compared with the children vaccinated for 2018.

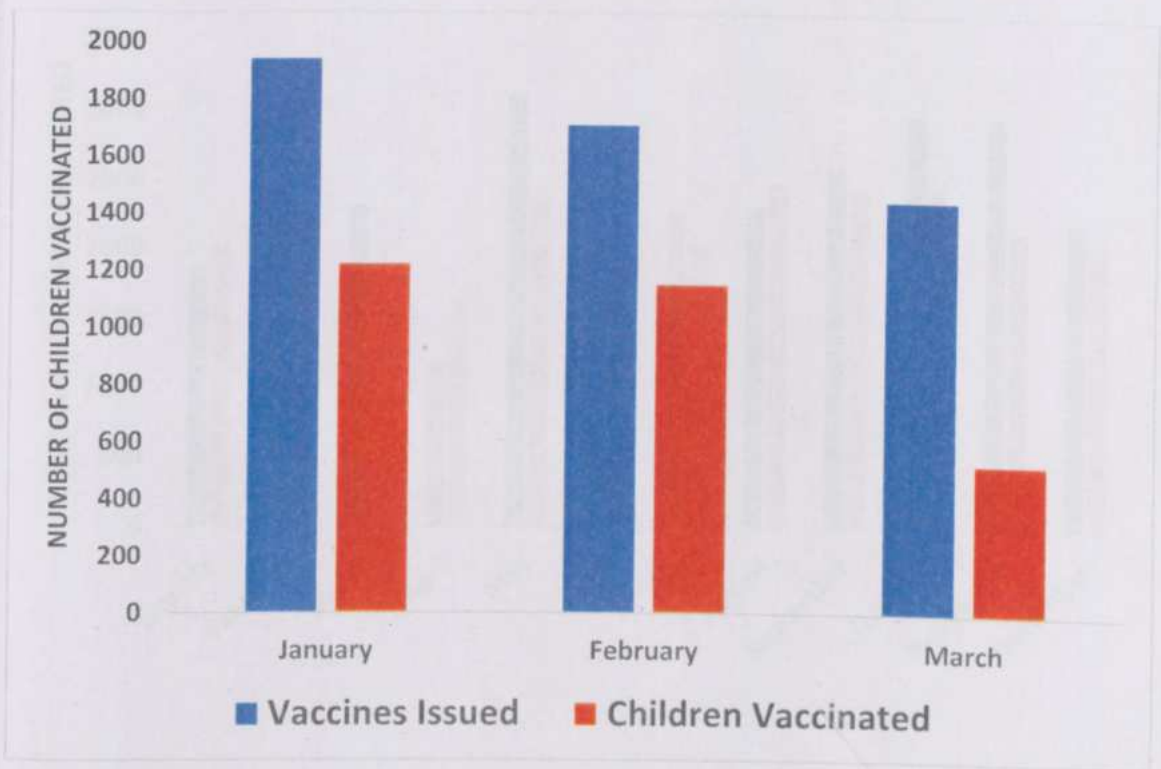


Figure 15: Okaikoi Submetro Conjugate A Meningococcal vaccines issued as compared with the children vaccinated for the first three months of 2019.

Figure 13,14 and 15 compared Men A vaccines issued for the year 2017, 2018 and the first quarter of 2019 with large variation. In 2017 except September where children vaccinated is higher than vaccines issued in all other months shows, double for some months in vaccines issued against vaccinated. The situation was not the same for 2018, where five months in a row or continuously children vaccinated are higher than vaccines issued. The total number of months with vaccination more than issued was 7 representing 58.33%. The first three months of 2019 shows issued more than vaccinated but the issued double for the month of March.

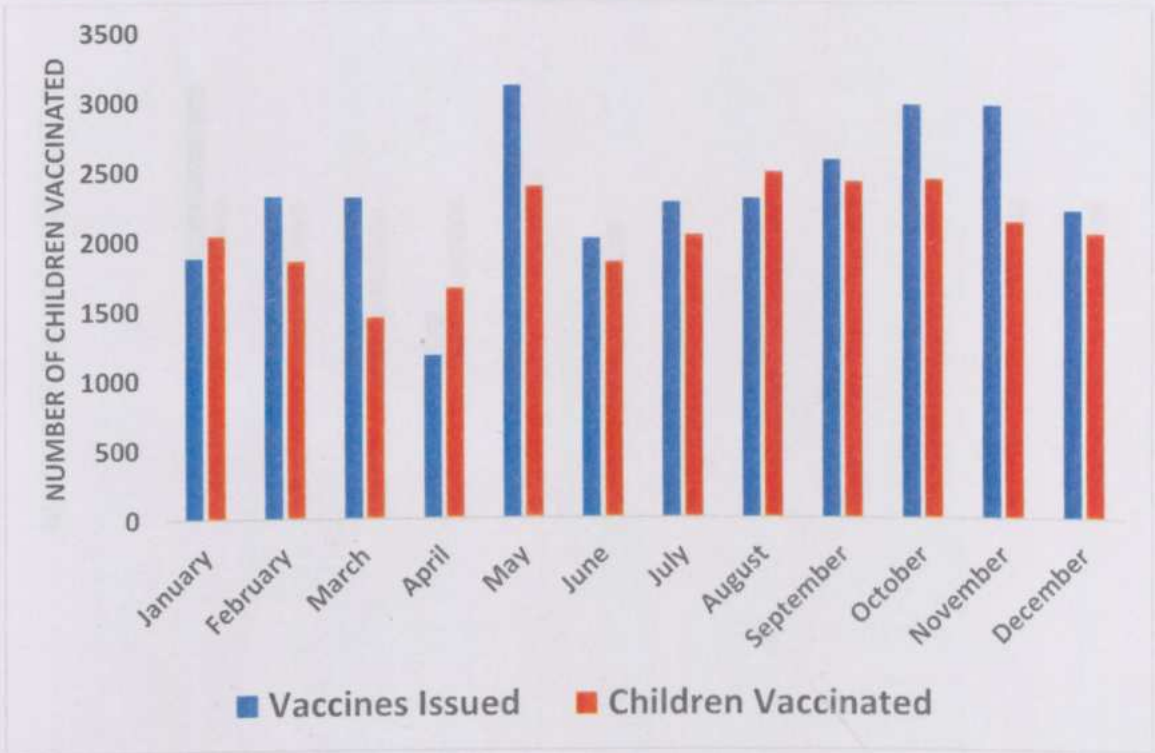


Figure 16: Okaikoi Submetro Measles-Rubella vaccines issued as compared with the children vaccinated for 2017.

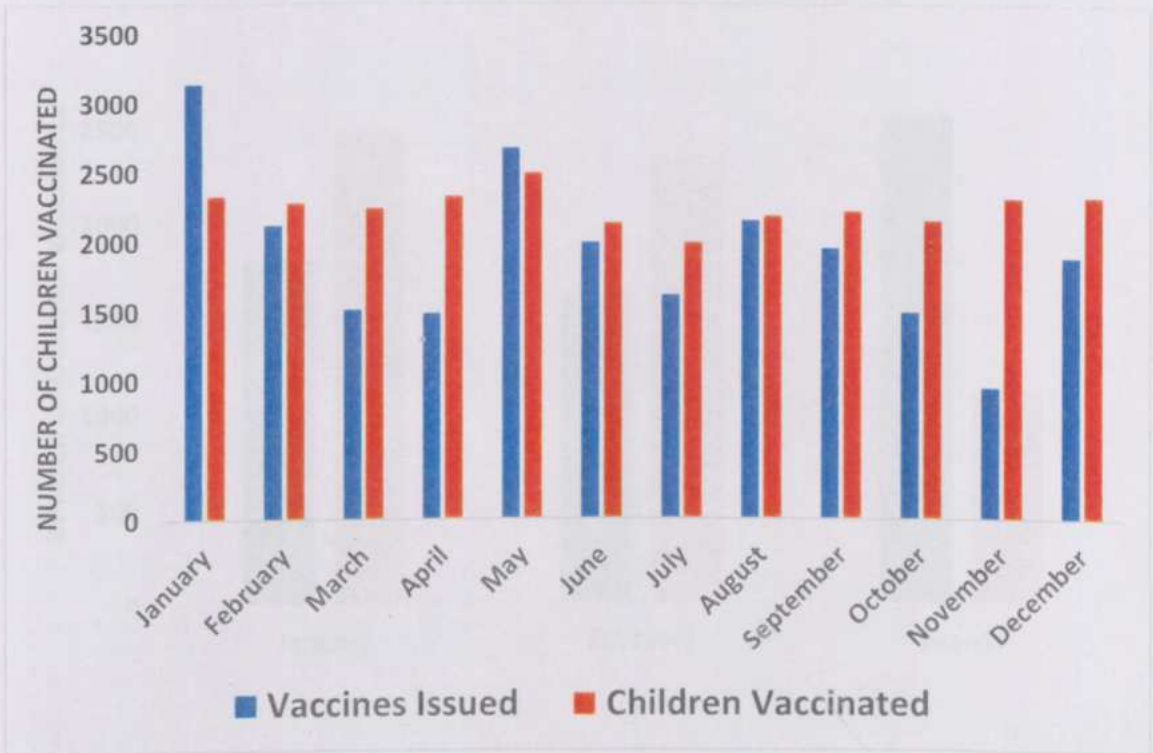


Figure 17: Differences in Okaikoi Submetro Measles-Rubella vaccines issued as compared with the children vaccinated for 2018.

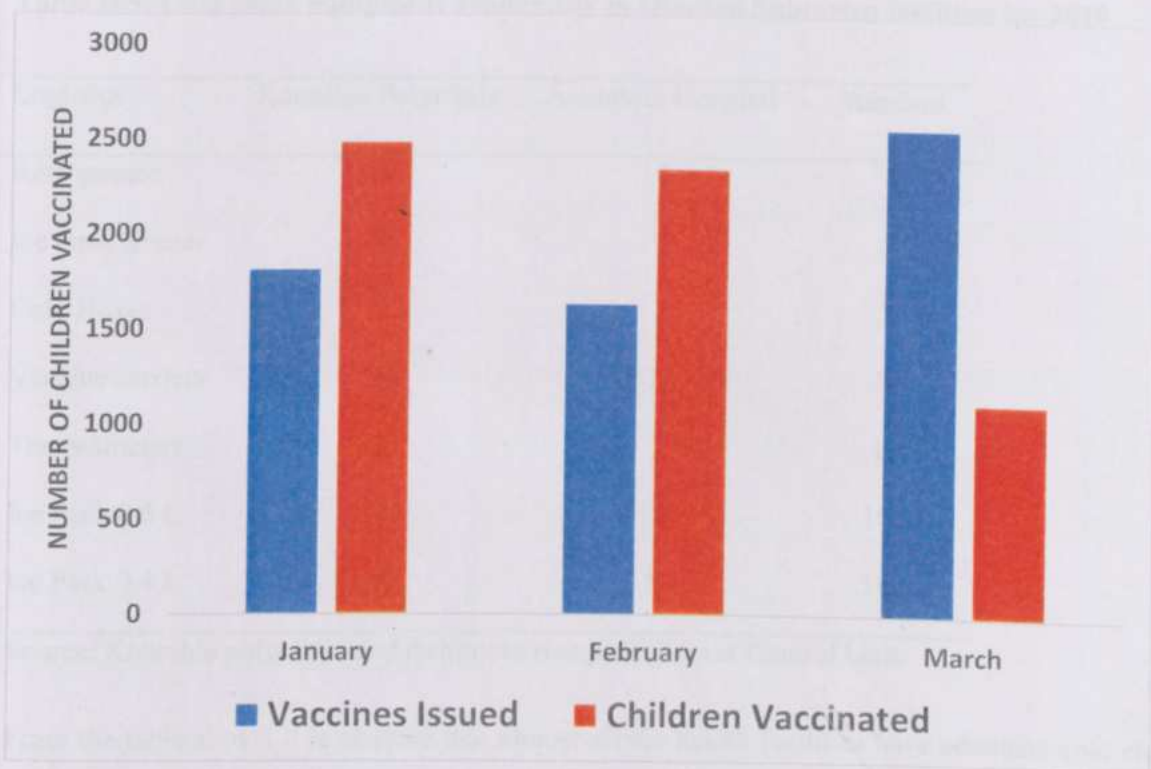


Figure 18: Okaikoi Submetro Measles Rubella vaccines issued as compared with the children vaccinated for the first three months of 2019.

Figure 16,17 and 18 compared MR vaccines issued for the year 2017, 2018 and the first quarter of 2019 with large variation. In 2017 except January, April and August where children vaccinated are higher than vaccine issued all other months shows normal vaccines issued against vaccinated. The situation was not the same for 2018, where from June to December in a row or continuously children vaccinated are higher than vaccines issued and only January and May shows slight vaccines issued against vaccinated. The total number of months with vaccinated more than issued was 10 representing 83.33%. The first two months of 2019 shows vaccinated more than issued but the issued double for the month of March against vaccinated.

Table 265: Cold chain equipment availability in Okaikoi Submetro facilities for 2019.

Logistics	Kaneshie Polyclinic	Achimota Hospital	Standard
Refrigerator	1	1	2
Ice Pack freezer	2	1	2
Cold Boxes	3	2	5
Vaccine carriers	98	13	10
Thermometers	2	2	10
Ice Pack 0.6 L	100	150	100
Ice Pack 0.4 L	40	50	100

Source: Kaneshie polyclinic and Achimota Hospital Disease Control Unit.

From the table above, it is obvious that almost all the health facilities have adequate cold chain equipment to carry out immunization activities. Thermometers also even though are available in the two facilities the numbers are lower than expected.

4.4 Community Factors

4.4.1 Community Mobilization Arrangements

Community mobilization for health programmes is usually expected to involve Unit Community members, assemblymen and women because they are in contact with the people and have their trust and support.

Four assembly persons each in Kaneshie zone and Achimota zone were interviewed using a structured questionnaire to assess the extent of their involvement.

Of the four at Kaneshie, one did not know of any immunization activities in his area of jurisdiction, whilst the rest knew and were involved through announcements at churches/mosques and doing announcements with the nurses.

Of the four at Achimota, one did not know of immunization activities in the communities. One knew but played no role whilst the remaining knew and were involved in mobilizing mothers for CWCs.

Apart from assemblymen, nurses were mentioned by the assemblymen as also involved in mobilization through the use of public address systems in both zones.

Mothers are also told of the date of the next CWC by the nurses.

It was also mentioned that no feedback was given to the communities on immunization.

4.5 Information on Mothers Who Took Part in Immunization

One focus group discussion (FGD) sessions were carried out in the two zones.

4.5.1 Kaneshie zone

The age group of the participants who number 9 in the FGD ranged from 20 years to 35 years.

The occupation of the participants included teachers, traders, hairdressers, seamstresses, a student, a caterer, beautician and unemployed.

Table 276: Kaneshie zone educational level of participants for focus group discussion in percentage.

Level Of Education	Number	Percentage
SSS	7	77.8
Tertiary	2	22.2

4.5.2 Achimota zone

The number of participants in the FGD was 9 and their ages ranged from 20 to 35years. These included traders, seamstresses, caterers, beautician, student and unemployed.

Table 287: Achimota zone participants educational level for focus group discussion in percentage

Level Of Education	Number	Percentage
JSS	2	22.2
SSS	4	44.5
Tertiary	3	33.3

4.6 Mothers' Perception of Immunization

4.6.1 Kaneshie

Cultural beliefs were not mentioned as being a barrier to child immunization. However, rumours making the rounds include fever and swelling at the site of injection at CWCs. Mention was made of a man who has refused to have his child immunized for fear of being paralyzed.

Even though mothers were satisfied with services rendered, some concerns were raised. These included lack of chairs at CWCs resulting in a lot of standing, long wait before being attended to, and not told what injections were being given to their children. Additionally, they complained of not being informed about the continuation of vaccination after one year but were told to visit every month for weighing the child and some nurses being rude to them.

On why some mothers do not attend CWC, this was attributed to some not knowing the importance of immunization, laziness, and some preferring to attend CWC at the hospital instead of near their house.

"My mother told me during our time CWCs we were given incentives like milk powder, weaning mix and oil which makes it very lucrative to attend which we are not getting anything this time but stress" A participant complained and was supported by the rest.

Asked how CWC attendance could be improved, they requested for additional nurses in order not to waste time at CWC and requested for chairs so as to feel comfortable. They also requested for 'tom brown' and intensification of education on radio and television. They want nurses to involve them more in the mobilization of the CWCs.

4.6.2 Achimota

Religious beliefs were mentioned as a barrier because some church members insist on practicing their doctrine of not patronizing orthodox medicine.

It was mentioned that nurses do not come early and as a result mothers have to stay long at CWC in addition to the nurses being inadequate. Additionally, sometimes the nurses are rude to them. Seating facilities was also mentioned as not being enough.

On the reasons why mothers were not patronizing CWC, it was mentioned that cost of living is high coupled with high transportation fare and husbands are reluctant to provide funds to wives for CWCs, gorgeous dressing of some mothers putting others off because they cannot do the same, laziness on part of some mothers, mothers leaving their children in the hands of caretakers to bring them to CWC but do not whilst the mothers go to work and not able to recollect date to visit CWC for the second year of life vaccination due to forgetfulness.

On how attendance to CWCs can be improved, mention was made of need for food supplements, use of house to house as a strategy to increase access, need for nurses to be patient, additional benches needed, need for nurses to explain the weight status of their children to them well and text messages to them on the next visit for the second year of vaccination since it takes more than six months.

4.7 Knowledge of Mothers on Immunization

4.7.1 Kaneshie

Immunization was mentioned as an activity to protect children and mothers from being ill.

Diseases mentioned as children were protected against were polio, measles, pentavalent vaccine, BCG, and yellow fever. The schedule was fairly known as BCG and polio were mentioned as

being given at birth and next administration in a month's time for polio and pentavalent vaccine. They were not able to mention measles-rubella and meningococcal vaccines. Mother said

"I do not see my child vaccinated after 9 months, we only come for weighing every month without the nurses telling me anything only to come next month again so I stop coming for CWC."

4.7.2 Achimota

Answers on what immunization include the following; gives children good health, protect children from diseases, something which is done every year to protect children from paralysis.

Diseases immunized against mentioned are tuberculosis, tetanus, polio, measles, cholera, hepatitis B, yellow fever, diphtheria.

On when immunization is given, it was mentioned that BCG is given at birth then 6 weeks after the child is given pentavalent vaccine then in 2 months' time is given another pentavalent vaccine and then at 9 months' measles. No mention of any second year of life vaccination in 18 months. Mother said,

"Bringing my child for CWC 9 months after last vaccination is frustrating coupled with a financial burden to come, only for my child to be weighed"

CHAPTER FIVE

DISCUSSION

This study in two zones of Okaikoi Sub metro provides insight into multiple challenges, both on the supply and demand sides, in achieving high vaccination coverage in the 2YL, potentially leaving many children under-protected from measles-rubella and *Neisseria meningitides A*. Although all zones achieved high (70%-99%) coverage and had low (0%-5%) dropout rates for vaccinations delivered in the first year of life that was Penta 3 used, coverage with MR2 and Men A, delivered in the 2YL, was modest (47%-81%). The dropout between MR2 and Men A was zero for the first quarter of 2019 and efforts needed to maintain it throughout the year.

Operational strategies employed included static, outreach, catch up and house to house. Considering the cosmopolitan nature of Accra, the use of different strategies is necessary to improve access to immunization service since many mothers for one reason or the other may not attend CWC. The study carried out in three regions of Ghana aimed at providing evidence for improving 2YL coverage with time (Nyaku et al., 2017). Furthermore, these strategies have been used with success in many countries such as Mozambique and Zambia as well as in other parts of Ghana (Nwameme et al., 2018). The introduction of urban CHPS is also to aid improve coverage but the implementation lack understanding and direction from health workers. They could not give an estimated population to some of the CHPS zones.

Generally, vaccines were available in the Submetro except for occasional shortages of MR and Men A. However, interestingly the level of vaccine stock and use in Kaneshie zone far outstrips that of Achimota zone. Considering the fact that the population of Kaneshie zone is higher than the Achimota zone, one is at a loss why stock levels and use should show such disparity. Another issue of concern is the poor documentation on supplies in Kaneshie polyclinic. Proper

documentation will help better planning to ensure availability of the required vaccines. Documentation on needles and syringes use in the various health facilities were not captured in ledger books even though the distribution of such logistics was done. No mention of the shortage was made by any of the nurse respondents. Needles and syringes availability therefore, was identified as adequate but it was noted that expiry dates were not known to health staff.

The cold chain equipment in the health facilities show significant shortcomings. Even though the health facilities have refrigerator each the standard is not met. It would appear that this not a major constraint in service delivery. Significantly, all the health facilities have less than expected thermometers. However, temperature readings are being done regularly. Ice packs are available in adequate quantities considering the service minimum requirements. However, Achimota hospital has one ice pack freezer, which has no impacts on the availability of ice packs. Nevertheless, this anomaly needs to be corrected, since outreach services are being rendered.

Planning for outreach involves a lot of preparation. This includes the presence of an itinerary, organization of teams to undertake the activities as well as the centres at which the activities are to be carried out. The presence of itineraries in all the institutions is an indication of some preparation but the number of outreach points outweighs the staff strength. Planning needs consideration of staff availability. Hand book for strengthening 2YL vaccination identified planning a catch up exercises as relevant (WHO, UNICEF, 2018).

Provision of funds constitutes a very important arm of the process of service delivery. Basically, public health nurses are made to prepare budgets which are invariably made available to the head of the institution. However, as and when funds are needed memos are submitted for their release

sometimes on a weekly, fortnightly or monthly basis. However, requests are sometimes inflated necessitating the need to scrutinize and cut down resulting in delays in releases or reimbursement after service delivery.

Logistics release arrangements mentioned suggests that logistics are made available either the previous day or on the morning of the CWC. Possibly this could be one of the reasons for late departure as the officer responsible for logistics issues coming to work late could create such problems. It is preferable that logistics for outreach are released the day before the activity. For mothers to patronize child welfare clinics regularly, there is the need for nurses to arrive early at the centres as many women would want to be catered for early so that they could attend to other personal activities. However, in view of the fact that some nurses leave at around 9 00 am 9 30 am it is evident that a lot of the CWCs start late. This point has been buttressed by the mothers at Achimota when they stressed on the late arrival as a problem to them. To encourage more mothers to attend CWCs nurses will need to arrive at outreach clinics early.

Transport generally has always been a problem in many districts because of frequent breakdown of old vehicles or vehicles being used for other activities. Hence, other means of transport such as public or motorbikes have to be used. The findings in the two zones are therefore consistent with what is happening in many districts in Ghana (Nyaku et al., 2017). Supervision is necessary for any human endeavour as it ensures efficient performance. The fact that supervision was not regular from immediate supervisors and heads attests to the low level of supervision in health activities including outreach health services. How this can be improved remains to be seen in view of the dwindling human resource.

Every day, a lot of data is generated in health institutions throughout the country. However, most of them are not analysed before submission to higher levels. The result is that the necessary

information that could have been generated for action is missed. The fact that analysis is done is basically to compare with previous month's figures may mean that detailed analysis is not done. The second year of life vaccines is newly introduced which analyses should draw some attention but is lacking in that respect. Since immunization is important in preventing or reducing vaccine-preventable morbidities and mortalities, it is necessary that everything possible should be done to ensure that the location and the quality of service delivery should be excellent. The fact that the visited outreach points and static points were appropriate indicates something good even though mothers have complained about some centres not having adequate sitting facilities as evidenced at Achimota hospital.

Information flow to mothers is also deemed adequate and also confirmed by responses of mothers to service delivery of nurses. Worrying though is the observation of vaccine administration as being poor at some of the centres notably Achimota hospital, Abeka and Christian village. However, not many injection abscesses have been reported. Of concern too is the fact that tallying is poor at some of the centres. This in part may account for the low coverages. However, it is necessary for service providers to emphasize that mothers need to come back for further immunization as scheduled. There is a need for proper disposal of vaccine bottles. The many problems encountered at various outreach centres cut across both zones. With reference to structures, it is unfortunate that landlords should deny nurses places to offer services to children in their communities. Close collaboration with assemblymen could go a long way to addressing some of them. Chairs and tables could easily be provided by facility management. Possibly, some of these issues could be attributed to the selling of some products by service providers.

The wide differences between submitted data and those taken from registers showed that there are serious problems with documentation. Why this is happening is difficult to understand because what has been submitted should be available for research and other purposes at a later date. Perhaps this might have something to do with reported supervisors asking them to tally and equalize for the higher second year of life vaccination coverage. The differences some of which are as high as 93.7% will certainly need to be looked at which is similar to study done on improving urban poor communities in Ghana (WHO/UNICEF, 2017). This also casts doubt on the validity of data submitted. The tallying in the registers leaves a lot to be desired and will have to be addressed comprehensively. The study on situational analyses on the second year of life vaccination identified vaccination given for MCV 1 and MCV2 without being captured on child Health record book (Nwameme et al., 2018).

Information gathered from assemblymen indicate that whilst some are actively involved in the mobilization, others are not. Even though the use of public address system by the nurses is good, judging from the fact that the pickup is not always available, there could be problems especially in areas where the assemblyman's contribution to mobilization may be absent or minimal.

Additionally, the fact that mothers are told of the next CWC does not ensure attendance as some of the mothers may forget unless prompted or reminded. New mothers with no CWC experience will also need to be well briefed on immunization days or dates and this, the assemblymen should be well placed to perform since they are in constant touch with the people. Perceptions especially negative ones are strong drawbacks to immunization especially when they influence others who unfortunately are not well informed on the issue. It is therefore, necessary to nip any such thing in the bud early. Even though cultural beliefs did not come up as a barrier, religious beliefs featured strongly to the extent of mothers rejecting orthodox medicine altogether. One

man rejected immunization for fear of the child becoming paralysed. Even though the fears may be founded to some extent, this is known to be associated with those who have never had any immunization. Generally, mothers believe immunization is good for their children and are satisfied that the nurses are doing a good job. However, the numbers of nurses are deemed as inadequate, rudeness of some nurses and the long waiting time it takes to be seen put some mothers off resulting in poor attendance. Other concerns expressed include not being told what injections were given. Collection of tokens is something that has been banned but unfortunately the practice continues by selling weighing bags to them. Even though it was not mentioned at Kaneshie, it does not rule out the possibility of the practice going on there too. Of concern too is the issue of inadequate sitting facilities which one way or the other has to be addressed and the issue of yellow cards which mothers claimed were being given to some whilst others was not.

Mention of food supplements as a solution to attendance is worrying because it is not sustainable. However, a way should be found around it with the involvement of the mothers themselves. Generally, the reasons why children are given immunization are well known by the mothers which imply that the educational lectures given the mothers at CWCs have gone down well. However, when it came to immunization mothers in Kaneshie appeared not to know the schedule better as they could hardly mention vaccines administered during the second year of life. Those from Achimota even though knew some of the schedules, they mixed up some of them. Interestingly, one of the diseases mentioned as being preventable by vaccination is cholera. It is hoped that, the knowledge level exhibited by the mothers will be maintained as this will ensure the sustained interest of mothers in immunization as a way of preventing vaccine-associated diseases.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

Immunization is and will continue to be one of the pillars in the health system. However, shortcomings identified in this research shows that serious challenges do exist which have to be addressed when vaccines are introduced.

The vaccine coverages have seen some improvement year after year but if care is not taken 2019 coverages could be worse than 2017. The assessment reveals that some zones were not given estimated population and also vaccination is not carried out for some months which staff need to step up their strategies including catch up exercises to bridge the gap before the end of the third quarter.

Staff training and constant reminder given on 2YL could assist in reducing service providers input in affecting the second year of life immunization coverage.

The facilities in ability to go for vaccines from the store when realized using minimum stock and run short before restocking is causing missed opportunities in vaccination since mothers are turned away because of not having MR and Men A.

Parents are found to be interested in participating in the welfare of their children but the vaccination team has to involve them and educate them extensively on schedule on 2YL vaccines.

The most significant of all is the issue of shortage of vaccines, poor documentation and supervision which if addressed will significantly help improve the second year of life immunization coverages.

6.2 RECOMMENDATION

The supervising of nurses in the field has to be strengthened in CHPS and outreach sites. This could help address day to day challenges that may confront vaccination teams. The supervision to be critical on achieving the daily target for a vaccination session.

In view of the poor knowledge in the second year of life catch up policy, all teams should be provided with policy and educated on for understanding. The vaccine ledger book to be updated regularly by Disease Control Officers taking into account minimum and maximum stock level for collecting next stock. The Disease Control Officers must be educated to understand how to calculate vaccine requirement for the year and various facilities or areas paste it on their notice board.

The heads of facilities should make transportation of vaccines to sites and Accra Metro a priority to avoid shortages. The early arrival of nurses at outreach centres is paramount and all efforts should be made by immediate supervisors to ensure that. Nurses need to be trained in the use of tally registers and data extraction from the registers accurately and effectively. In view of the complaints of mothers about long waiting lines, teams need to be restructured to work in threes instead of the present twos and increase frequency to the field

Mobilization of mothers should be done with the active involvement of assembly members, unit committee members and women in their areas of jurisdiction. Management of health facilities will have to liaise with assembly members to address the problem of poor sitting facilities at outreach centres. Management should provide the seats and assembly members to ensure safekeeping. Sustained education in the communities during the second year of life vaccines is the way forward and must be pursued vigorously.

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APPENDIX I

UNIVERSITY OF GHANA

SCHOOL OF PUBLIC HEALTH

LEGON

1.0 PARTICIPANTS INFORMATION SHEET

Assessment of second year of life immunization performance in the Accra metropolis.

Date ___/___/2019

1.1 Participants information sheet

The Information Sheet provides information about the research for the participants to make an informed decision of the whether to participate in the study or not. it outlines the nature of the research, what the research involves, risks, benefits, compensation.

1.1.1 Introduction

My name is **Oxygen Gershion Wullar**. I am a student of University of Ghana, Legon conducting a study on **Assessment of second year of life immunization performance in the Accra metropolis**. The research forms part of my academic work, for the award of MPhil of Applied Field Epidemiology and Disease Control.

Research Title: Assessment of second year of life immunization performance in the Accra Metropolis.

1.1.2 Background and Purpose of the Research

This study is a mixed method which is of qualitative and quantitative design. Vaccination in second year of life is to boost the immunity of children after first birthday to five years of age. The second year vaccination exposes children who did not seroconvert during the first year of life vaccination in nine months to now have opportunity to be fully immunized against killer diseases. Accra Metropolis is characterized with high floating population which outbreak of measles, rubella and meningitis will be serious public health burden.

1.1.3 Nature of Research

This research is intended to identify reasons that leads to low coverage performance of second year of life vaccines in the Accra Metropolis in spite of funds allocated to improve performance

are not yielding results equally among the Submetros. This will involve 169 participants comprising of Head of Facilities, Public Health Nurses, Disease Control Officers, Community Health Nurses and Mothers at the Okaikoi Sub Metro.

1.1.4 Duration / what is involved

Taking part in this study will take about 20 minutes of your time and we expect your honest response in answering of the questions. The questions are about you and your experiences at work.

1.1.5 Potential Risks

There is no a known direct risk or side effects to this study. You may feel exposed about revealing sensitive information during the study. Confidentiality is highly guaranteed for you to feel free to talk to the researchers.

1.1.6 Benefits

The study will be beneficial in that it will inform policy makers in strengthening existing policies that promote high vaccination coverage performance.

1.1.7 Costs

There is no cost involved.

1.1.8 Compensation

There will be no compensation or fee paid to participants for agreeing to participate in this study.

1.1.9 Confidentiality

All personal identifying information about yourself will remain confidential and will not be included in the final write up. Any quotation to be used in reporting the findings will not include names or any identifying data to ensure anonymity. All recordings and transcripts will only be accessible to the researcher.

1.1.10 Voluntary Participation and withdrawal

Your participation in this study is voluntary and as such you have the right to withdraw anytime you feel any discomfort during the data collection process of filling questionnaire within few minutes. If you decide to withdraw from the study, the data provided by you will be destroyed.

1.1.11 Outcome and feedback

Feedback will be given to facilities at Okaikoi Sub Metro. The finding will give the government of Ghana and other key stakeholders the insight required to guide or amending ways of organizing Child Welfare Clinics.

1.1.12 Feedback to Participants

Presentation on findings will be disseminated to participants through seminar.

1.1.13 Funding information

The principal investigator will fund the study.

1.1.14 Sharing of Participant Information / Data

The data generated is owned by Accra Metro Health Directorate which will be shared with School of Public Health for academic purposes.

1.1.15 Data storage and usage

The survey data was stored securely in a database which was used purposely for this study.

1.1.16 Conflict of interest

There is no conflict of interest in this study.

1.1.17 Contact

If you have any questions about the study or procedures involved, you may contact me on

Address: Accra Metro Health Directorate, PMB PMUT 14, TUC – Accra.

Telephone Number: 0243124789

Email: oxygenbay@yahoo.com

OR

Hannah Frimpong GHS-ERC Administrator Office: +233 302 681109

1.2 CONSENT FORM

STUDY TITLE: ASSESSMENT OF SECOND YEAR OF LIFE IMMUNIZATION PERFORMANCE IN THE ACCRA METROPOLIS

1.2.1 PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and satisfactorily explained to me in a language I understand (English /Twi). I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name or Initials of Participant:.....ID Code:.....

Participants' Signature:.....OR Thumb Print.....OR Mark (Please specify).....

Date:.....

1.2.2 INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (Twi) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his / her satisfaction.

Name of Interpreter:.....

Signature of Interpreter:.....

Date:.....

Contact Details

1.2.3 STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he / she understood (English / Twi).

I confirm that he/she was given the opportunity to ask questions / seek clarifications and same were duly answered to his / her satisfaction before voluntarily agreeing to be part of the research.

Name:.....

Signature:.....OR Thumb Print:.....OR Mark (please specify).....

Date:.....

1.2.4 INVESTIGATOR STATEMENT AND SIGANTURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name:.....

Signature:.....

Date:.....

1.3 Data Collection Instruments

1.3.1 Heads of Institutions

Submetro..... Date.....Name of Facility.....

1. What immunization strategies do you use in the submetro/facility

.....
.....

2. How do you ensure availability of EPI logistics for the smooth running of immunization activities in your submetro

.....
.....

3 What arrangements do you have in place for the timely release of funds for EPI activities in your submetro

.....
.....

4. How do you monitor EPI performance in your facility considering second year of life?

.....
.....

5 Do you supervise staff performing immunization in an outreach?

Yes No

If Yes How many times have you done that this year

.....

6. Are there any problems that have come to your attention pertaining to organization of EPI activities for second year of life vaccinations?

.....
.....

1.3.3 Community Health Nurses

Submetro..... Name of Respondent..... Date.....

1. How many outreach points do you have in your zone?
.....
2. How often do the outreach clinics take place.....
3. How often do the static clinics take place?.....
4. What other strategies do you use in providing immunization to the population in the submetro
.....
5. What time do you leave for outreach clinics
6. What logistics do you take along for outreach?
.....
7. How do you get to the outreach points?
.....
8. Are you supervised by your superiors at outreach clinics
Yes No
If yes who and how many times so far this year
.....
9. Have you run short of MR and Men A vaccines this year? Yes No
If Yes which type and for how long
10. Are there any other problems you face that you think are significant
.....
.....

1.3.4 Focus Group Discussion Guide

Submetro..... Date.....

Knowledge of Mothers

1. What do you understand by immunization?
2. Why do you think immunization is given to
Children under 1 year
Children above 1 year
3. What are some of the diseases children are immunized against in second year?
4. State the immunization schedule for second year of life immunization?
5. What situations do you think would warrant a child not being given immunization?

Perception of Immunization

1. What cultural beliefs are you aware of associated with immunization?
2. What rumours are you aware of associated with immunization?
3. How satisfied are you with services rendered by the nurses?
4. What reasons do other mothers give for not attending CWC?
5. What do you think if done can improve attendance to CWC?

Mobilization of mothers

1. How are you mobilized to attend CWC?
2. Who does the mobilization
3. How long has he/she been doing this and how did they come to be performing this activity?
4. Are there any problems that may have cropped up in the course of mobilizing?

1.3.6 Interviewer questionnaire /Observation Checklist

Name of vaccination point.....

Number of staff conducting vaccination at point.....

1. Do you know of second year of life policy	Yes	No
2. Do you know of second year of life catch up policy	Yes	No
3. Do you have second year of life catch up policy	Yes	No
4. Do you schedule clients for second year of life Vaccination after given 9 months' vaccines	Yes	No
5. Appropriateness of site	Yes	No
6. Do you know your annual target population	Yes	No
7. Do you know your monthly target population	Yes	No
8. Do you know your weekly target population	Yes	No
9. Do you know your daily target population	Yes	No
10. Do they start CWC late	Yes	No
11. Adequacy of sitting facilities	Yes	No
12. Adequacy of information given to mothers	Yes	No
13. Administration of vaccines correctly	Yes	No
14. Information given to mothers on need to come back	Yes	No
15. Tallying immediately	Yes	No
16. Vaccine bottles disposed appropriately	Yes	No

1.3.7 Checklist For Cold Chain Equipment

Submetro..... Facility Name.....

Officer Responsible.....

Date.....

Standard Equipment at Submetro Cold Room	Cold Chain Required at	Number	Cold Chain Equipment Available at the Submetro Cold Room	Number
1. Refrigerator freezer		2		
2. Ice Pack freezer		2		
3. Cold Boxes		5		
4. Vaccine Carriers		10		
5. Thermometers		10		
6. Ice Packs 0.6L		100		
7. Ice Packs 0.4L		100		

1.3.8 Checklist For Vaccines, Needles, Syringes, Child Health Records And Tally Registers

Submetro..... Facility Name.....

Officer Responsible.....

Date.....

Stock Level from Stock Register 2017 to April 2019

Logistics	MR	Men A	Needles	Syringes	Child Health Records
Jan.					
Feb.					
March					
April					
May					
June					
July					
Aug					
Sept					
Oct					
Nov					
Dec					
Present Stock					

Tally Registers in Stock	
--------------------------	--

1.3.9 Questionnaire for Opinion Leaders (Assembly Members/Unit committee members)

Submetro..... Name of respondent.....

Date.....

1. Are you aware of any immunization activities in your electoral area?
Yes No

2. If Yes, what role do you play in these activities
.....

3. Are you involved in any other health activities in your area?
Yes No

4. Are you aware of who mobilizes the mothers for immunization sessions?
Yes No

If Yes, who does it

5. How is it done
.....

6. Is there any feedback to the community on Child Welfare Clinics?
Yes No

If Yes, what form does it take
.....
.....

APPENDIX II
ETHICAL CLERANCE

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

*In case of reply the
number and date of this
Letter should be quoted.*



Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: ghserc@gmail.com
17th January, 2019

MyRef. GHS/RDD/ERC/Admin/App 19
Your Ref. No.

Cynthia Nana Yaa Konadu Klobodu
Kotoka International Airport
P.O. Box 9457
Accra-Ghana

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	GHS-ERC020/01/19
Project Title	Assessment of Maternal Birth Preparedness towards Delivery in the Greater Accra Region
Approval Date	17 th January, 2019
Expiry Date	16 th January, 2020
GHS-ERC Decision	Approved

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.
- Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra