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An assessment report on an immunization clinic located in a tertiary institution in Ibadan

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Abstract Objectives: The aims of the assessment report were to appraise immunization system components and review vaccination coverage between January 2007 and December 2011 at the University College Hospital (UCH) immunization clinic.

Methods: The immunization clinic has an annual target population of 997 (for children < one year of age) and 1246 (for pregnant women), which were used in this assessment. The data collection method used included; Key informant - interview, administration of a semi-structured questionnaire, records review and observations during immunization sessions.

Results: The UCH immunization clinic mainly offers fixed sessions and only provides outreach services when there is a need, such as during outbreaks. However, there are no records of vaccine-preventable diseases being monitored. The coverage rate for nearly all of the vaccines was greater than 100% of the estimated target population for the hospital. Except for the coverage rate of Bacille Calmette Guerin

(BCG) vaccine, which peaked in 2011, other vaccines' coverage peaked in 2009, after which there was a decline. The highest dropout rate was recorded in 2007, while the rates between 2009 and 2010 were <10%, but the BCG and measles drop out rates were >10% for the 5-year period. For the adult immunizations, yellow fever recorded the highest coverage rate, while the lowest rate was recorded for tetanus toxoid dose 5 (TT5). The vaccines that were most often in short supply included Diphtheria- pertussis-tetanus, Hepatitis B, yellow fever, oral polio, and cerebrospinal meningitis vaccines. Although good-quality supplies, equipment and consumables were observed, there was no inventory of these items. There were evident interpersonal communication and community mobilization as well as capacity building for staff.

Conclusion: The assessment showed there was progress in the provision and administration of immunization based on available resources. There is, however, the need to improve documentation of clinic activities.

Introduction

Immunization remains the primary strategy for the prevention and control of common childhood diseases, especially in the developing world¹. Prevention of child mortality through immunization is one of the most cost-effective public health interventions in use in resource-poor settings². Childhood immunizations have dramatically reduced the incidence rates of debilitating and sometimes lethal diseases^{3,4}. In developing countries, immunization programmes prevent approximately two million deaths per year, which would have resulted from

measles, neonatal tetanus, and whooping cough^{5,6}. Nigeria's child's immunization coverage has remained low over the past decade. The low coverage has been identified to be attributed to weak health structures and systems, inadequate funding by government, over dependence on donor funds, withdrawal of funds and lack of ownership at the community level.⁷ However, Nigeria, like many countries in the African region, is making efforts to reduce disease burden from vaccine-preventable diseases (VPDs) by strengthening the health system in general and routine immunization system and services in particular⁸. Five operational (service deliv-

ery, quality vaccine supply, logistics support, surveillance for VPDs, and advocacy and communication) and three supportive (sustainable financing, programme management, and human and institutional resources) components of the immunization system have been identified for improvements⁷. To strengthen the service-delivery components of the immunization system, for example, the country adopted the reaching every district (RED) approach of the World Health Organization and renamed it the reaching every ward (REW) approach to reflect the administrative structure in Nigeria. In this approach, five strategic components (with expected activities) were identified for improvements. These include

1. Planning and management of resources, through quarterly micro or detailed planning for human, material and financial resources, and
2. Improving access to immunization services through establishment or re-establishment of fixed, outreach and mobile immunization sites. Other strategic components are
3. Supportive supervision through onsite or on-the-job training,
4. Community links with service delivery through regular meeting between community and health staff, and
5. Monitoring and use of data for action through, coverage/dropout reviews, dose charting, mapping of population in each facility and categorizing health facility based on access and utilization of services.

The improvement plans for each of the immunization system components, expected activities including task description, and monitoring indicators at the health facilities, ward, local government, state and National levels have been described⁷⁻¹⁰. Improving immunization coverage will require regular assessment of the immunization delivery system to determine if programme objectives are being met, to identify problems and causes of low coverage and to plan activities to increase coverage^{7,10}.

The National Programme on Immunization (NPI) was initiated with a vision of achieving sustainable immunization service delivery through community ownership, community operated and community driven strategies⁷. Consistent with the above vision; the University College Hospital (UCH) immunization clinic was opened to attend to the immunization needs of hospital staff.

History of the immunization clinic

The centralized immunization clinic of UCH was formerly referred to as the staff immunization clinic. The clinic was opened to attend to the vaccination needs of staff members and their dependants. As a result of the small target population, many doses of vaccines were usually left over after each vaccination session and the liquid vaccines had to be returned to the state vaccine store. It was observed later that many UCH patients/clients were requesting administration of one vaccine or another. The decision was thus made in 1990 that the immunization clinic should serve other registered people in the clinic. Since then, the clinic attendance has been

increasing on a daily basis. However, no appraisal of the immunization coverage and system activities has been undertaken since inception.

National immunization objectives

The main national immunization objective was to develop and promote immunization programmes geared towards the reduction of childhood morbidity and mortality through adequate immunization coverage of all at-risk populations⁹. The specific objectives of the national immunization programme were as follows: Improve and sustain routine immunization coverage of all antigens to 90% by the year 2020, in agreement with the national vision; Achieve, through quality supplemental activities, interruption of polio transmission by the end of 2009, and total eradication by the end of 2013; Eliminate maternal and neo-natal tetanus by the end of 2010; Prevent, detect, control, and eliminate the occurrence of out breaks of CSM, measles, yellow fever, and any other VPDs in all parts of the country; and reduce childhood mortality due to immunizable disease⁹.

Mission/Vision of the UCH immunisation clinic

Mission/Vision of the UCH immunization clinic is to render excellent and prompt immunization services in a suitable environment.

Objectives: The objectives of the UCH immunization clinic are as follows: reduce the mortality and morbidity rate arising from communicable diseases, especially childhood killer diseases, through active immunization of members of staff and their families in UCH, including registered members of the community; investigate the effectiveness of preventive measures (health education, counseling, contact tracing, home visits, and surveillance) offered to control the infectious disease on a quarterly basis; support and participate in the global and national targets/programmes in the eradication of the diseases; and to study default rates among clients and find solutions to the identified problems on a quarterly basis.

Objectives for conducting the assessment

The general objective was to appraise the immunization system components and review vaccination coverage between January 2007 and December 2011 at the University College Hospital (UCH) Immunization clinic, so as to use the findings to make recommendations.

Specific Objectives: The specific objectives were as follows: to determine immunization coverage data in the clinic; identify the strengths of the services; and determine constraints to achieving the program objectives using the immunization system approach.

Methodology

Catchment area and target population

University College Hospital is located in the Ibadan North Local Government Area (LGA) of Oyo state. The LGA has a population of 374,948 (2011 estimate) based on 2006 census estimates and is divided into 12 administrative wards. The wards that make up the LGA include Oke-Are, Nalende, Yemetu, Agodi, Bashorun, Sabo, Sango, Ago-Tagba, Old Bodija, Samonda, and Agbowo. UCH is located within the Old Bodija ward, which has a population of 41,245. Only three health facilities are recognized as immunization clinics in the ward (UCH, Institute of Child Health [also within UCH], and the Obasa Health Facility). The UCH clinic had an annual target population of 997 for children <1 year of age, and 1246 for pregnant women, as obtained from the LGA immunization unit. The communities served by the UCH clinic include Awosika, Adeyi, Abedo, Osuntokun, Ondo, Ajibade, Obasa, Awolowo, Ekiti, and Coca-Cola.

Data collection and instrument

The information gathered during the assessment was both qualitative and quantitative on the five operational and the three supportive components of the immunization system. Three methods of data collection were used during the assessment, and include the following: Record review, extracting data on the vaccines used, and vaccination coverage from immunization records from January 2007 and December 2011; Interviews, discussion, and probing of the head of the immunization clinic using a semi-structured interviewer administered questionnaire adapted from the WHO assessment questionnaire, with categories based on the operational and supportive components of the immunization service delivery, including, vaccine supply, disease surveillance, logistic and advocacy, capacity building, and financial management; and Observations during immunization sessions

Data Analysis

Data on immunization coverage for the five year period was entered into Microsoft excel. In order to compare the trends in the coverage rates, the percentage coverage for infants and adults vaccines were computed for the period the review covered. The cumulative monitoring charts for DPT1 & DPT3, BCG & Measles were also computed, as well as their dropout rates.

Ethical consideration

Permission to carry out the assessment was obtained from the Chief Medical director of the University College hospital. Permission to use the records of the immunization clinic was obtained from the head of the unit.

Results

The findings of the evaluation were as follows:

Service delivery

The services provided by the clinic include the following: Infant welfare clinic; Yellow card processing; TB screening; Child and adult immunization; and outreach programs. The UCH immunization clinic mainly offers fixed sessions and only provides outreach services when there is a need, such as during outbreaks. The clinic is open throughout the week (Mondays to Fridays) between 8am and 5pm. The largest number of clients is seen on Wednesday and Thursday because all of the vaccines are administered to the clients, unlike other days. Public health nursing personnel and doctors from the Family Medicine Department attend to the medical needs of clients on every clinic day. The vaccines administered include the following: Monday (BCG, HBV, OPV, and other special/non-routine vaccines); Tuesday (yellow fever and TB screening); Wednesday (BCG, HBV, OPV, DPT, HIB, and non-routine vaccines); Thursday (BCG, HBV, OPV, DPT, HIB, measles, and TT); and Friday (special vaccines, child welfare, and TB screening).

For fixed sessions, planning is continuous and daily due to the daily administration of vaccines. Work plans are non-existent in the clinic, and all of the standard data management tools are not available. Specifically, only an improvised immunization register and the child health card are available, while the tally sheet, immunization summary sheet, and immunization coverage monitoring chart are not available. Thus, monitoring for dropouts, vaccine wastage, categorization, and prioritization is nearly impossible. The form for recording adverse events following immunization (AEFI) are not available, thus there is no method for tracking AEFI and none has been reported in the past five years.

The staffs administer the vaccines correctly (the correct site, route, and dose). The staff practice injection safety and dispose of used syringes/needles immediately into the safety box. The staffs record each vaccine on the child immunization card correctly, but do not tally correctly on the tally sheet. The immunization registers used are ordinary notebooks, and thus are not correctly filled out and there are no mechanisms to track vaccine doses that are due or to track defaults. The staffs are aware of the standard operating procedures and necessary forms to complete if there is a report of an AEFI, but the forms are not available.

Immunization coverage for the five year period

The coverage rate for nearly all of the vaccines was >100% as a result of the low yearly target population of the hospital estimated by the LGA from the census population of the ward where the hospital is located. Except for the coverage rate of BCG, which peaked in 2011, other vaccine coverage peaked in 2009, after which there was a decline (Figure1). The DPT1-DPT3

dropout rate was almost the same as the BCG- measles dropout rate; the highest dropout rate was recorded in 2007, while the rates between 2009 and 2010 were <10%, but the BCG and measles drop out rates were >10% for the 5-year period (Fig 2 and Table1). For the adult immunizations, yellow fever recorded the highest coverage rate, while the lowest rate was recorded for tetanus toxoid dose 5 (TT5; Fig 3).

Fig 1: Vaccine coverage for the 5-year period

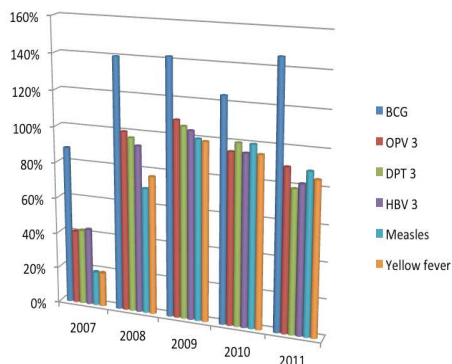


Fig 2: Monitoring chart for cumulative DPT1 and 3 for the 5-year period

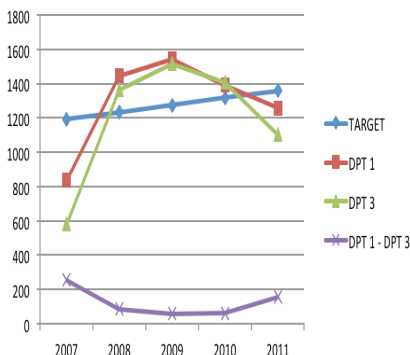


Table 1: DPT1-DPT3 and BCG-measles dropout rates for the 5-year period in the UCH Immunization clinic

	Year 1	Year 2	Year 3	Year 4	Year 5
%DPT 1	70.2	117.4	121.4	105.8	92.6
%DPT3	48.7	110.5	116.7	106.9	80.2
%Drop out/	30.5	5.9 (Cat1)	3.9	-1.1	13.4
*Categorization (Cat4)			(Cat1)	(Cat1)	(Cat2)
%BCG	103.0	159.5	156.4	132.3	150.7
%Measles	22.0	79.2	106.7	106.0	91.6
%Drop out/	78.6	50.3	29.9	19.8	39.2
*Categorization	(Cat2)	(Cat2)	(Cat2)	(Cat2)	(Cat2)

- Category 1: Good access good utilization
- Category 2: Good access poor utilization
- Category 3: Poor access good utilization
- Category 4: Poor access poor utilization

Fig 3: Monitoring chart for cumulative BCG and measles for the 5-year period

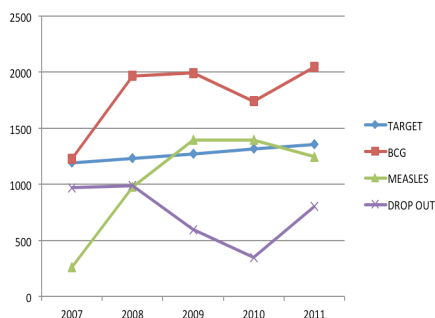


Fig 4: Immunization coverage for adults over the 5-year period.

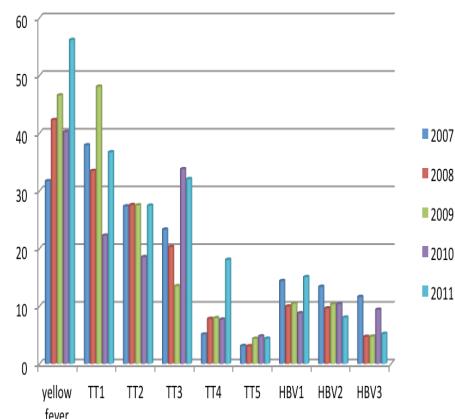
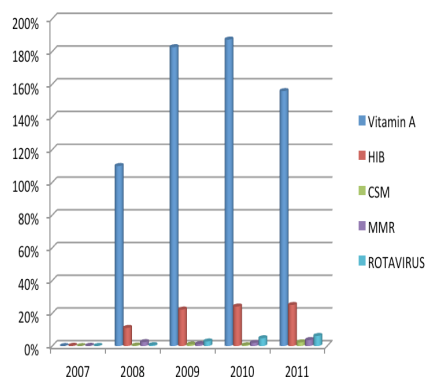


Fig 5: Coverage for other childhood vaccines provided in the clinic in the 5-year period



Vaccine supply

The routine immunization vaccines were collected from the LGA by the health facility staff two times per month. Auto-disable syringes, which are bundled with the vaccines were also collected from the LGA and were used to administer vaccines and disposed using safety boxes. Vaccines were available during immunization sessions. The vaccines that were most often in short supply included DPT, HBV, YF, OPV, and CSM. Only those vaccines that had not expired and those in vaccine vial monitor (VVM) stages 1 and 2 were used for immunization. After each session, HBV and DPT were returned to the refrigerator, while YF and measles were discarded in line with the multi dose vaccine policy.

There was no method for vaccine forecasting. Vaccines and dry stock ledgers were unavailable, thus vaccines were requested based on the previous records and requisition forms. There were no methods for vaccine utilization, waste monitoring and reduction in the clinic, thus the utilization rates could not be determined. Vaccines were stored in refrigerators and were handled properly during administration.

Disease surveillance

The clinic does not maintain records of vaccine preventable diseases (VPDs) and thus cannot determine if there is a reduction or otherwise, in the number of cases. Other variables, such as the incidence of VPD, the number of cases of non-polio acute flaccid paralysis, measles outbreaks, cases investigated, and determining if the incidence of disease and coverage rate correlate could

not be determined. Monthly immunization coverage reports were sent to the LGA, but there was no record of feedback from the LGA.

Logistics

Previously, routine immunizations, such as DPT, OPV, HBV, yellow fever, and vitamin A were received from the Jericho state store, but after a decentralization, the routine immunizations were supplied from the Ibadan North LGA store. In September 2011, a proposal was presented to the UCH management for the procurement of non-routine vaccines, which had been administered to children in Asia, the US, and many other African countries, and the same was approved.

The clinic management ensures a good quality supply, equipment, and consumables, but there is no availability of stock supplies and consumables inventory. The clinic has a sufficient amount and well functioning cold chain materials for effective and efficient service delivery, including refrigerators, freezers, cold boxes, vaccine carriers, icepacks, and foam pads. The temperature of the refrigerators and freezers were monitored to ensure optimum functioning. When the need for outreach arose, adequate transport and materials were made available.

Advocacy and communication

The health staff communicates effectively with parents and caregivers, and before administering the immunization, the health staffs provide the six key messages to the parents and caregivers. The health staff have good interpersonal skills and relate well with the clients. Only the UCH community is involved in the planning, while the other communities are not involved. This is a result of the fact that the clinic was initially established for the UCH community alone. There were no active attempts to reach the unreachable, defaulters, and non-users. The last form of evaluation for the clinic was performed in 2009.

Capacity building

At present, nine staffs currently work in the immunization clinic, of which six are qualified nurses. There have been in-service training for the staff on injection safety, prevention of HIV transmission, and stress management in the last five years. The staffs were also trained on calculating and creating the dropout rate chart, but the staffs do not put the knowledge into practice. The staffs are knowledgeable about administering vaccinations correctly and also provide the six key messages to parents/caregivers before administering the vaccines, but some times the staff do not register the vaccination correctly in the tally sheet, immunization register, and child health card. Job performances are regularly evaluated, but feed back is not provided.

Management

Targets are set by the LGA and are monitored in the

clinic. The target set for UCH is 83 clients per month, but because of the nature of the hospital as a tertiary health facility, the target is almost always exceeded, even on daily basis, thus accounting for >100% coverage recorded by the clinic. Data on the target population are determined by the LGA based on projections from the national population census figure. The clinic does not have a catchment area map for routine immunization showing all settlements, the population, and the type of session being used to reach the settlements. Work plans were not available and there was a lack of information sharing between the clinic and other departments of the hospital, especially the VPD record unit.

Discussion

The UCH immunization clinic mainly offers fixed sessions and only provides outreach services when there is a need, such as during outbreaks. This falls short of the 1,2,3 strategy for delivering routine immunization suggested by the Expert Review Committee on Immunization of the National Primary Health Care Development Agency⁹. The committee recommended that apart from weekly immunization services at fixed sites, outreach services are expected to be conducted by a health facility in areas >5km to the facility but within its catchment at least twice a month to improve access to immunization services. The concept of “reaching every ward” (REW) is meant to ensure that no community, no matter how remote is denied the opportunity to enjoy routine immunization services. It is therefore, important that communities that cannot be effectively accessed by use of existing fixed sites, be reached by using outreach or mobile immunization services. It was noted that coverage data are traditionally considered the best indicators of an immunization programme's performance because they reflect the management of access, and utilization of services². The immunization coverage rate for nearly all the vaccines in this report was >100%. This was higher than the coverage goal of the Nigeria comprehensive multi year plan 2011-2015 of 87.0% of infants for all antigens in the routine schedule by 2015⁷. This was also higher than the WHO-UNICEF estimates for Nigeria for each vaccine such as; BCG 69%, DPT3 54%, OPV3 61%, HB3 41%, and measles 62%¹⁰. Nigeria is among the twelve very high-risk countries in the yellow fever belt⁷. While yellow fever vaccine is currently part of the country's routine immunization schedule, the coverage like other routine immunization vaccines is low and as such there is a potential danger of large outbreaks of yellow fever. For the adult immunizations in this report, yellow fever recorded the highest coverage rate. This differs from the report of immunization coverage made in a tertiary teaching hospital in Niger Delta in which yellow fever/measles vaccines had the lowest coverage rate 94 (17.8%)¹¹.

Although the coverage for individual vaccines for infants were high at the clinic, the BCG and measles dropout rates were >10% for the 5-year period. Dropouts are

people who begin the vaccination schedule but fail to complete it. If a child does not receive all doses for a specific vaccine required for full protection against a specific disease, the resources that have been used are generally regarded as wasted. The main reasons for dropouts may include: problems relating to dissatisfaction of the quality of service rendered, such as, long waiting time and failure to give mothers and caregivers correct information on when and why to come back for subsequent vaccines/doses. Others include inability of the health facility to provide uninterrupted service delivery due to inadequate and timely provision of bundled vaccines for the catchment area target population and socio-cultural as well as administrative barriers such as: religious beliefs, decision making authorization on health related issues at the family level and irregular provision of routine immunization sessions at health facilities or outreach/mobiles services. The REW approach is expected to develop the capacity of health workers at health facility level to identify and reduce dropouts by ensuring quality and un-interrupted services at fixed, outreach and mobile sites⁷.

The vaccines that were most often in short supply included DPT, HBV, YF, OPV, and CSM. Similar report had been made by related study in Nigeria, whereby, the most common vaccines reportedly missed as a result of short supplies were BCG, OPV₀, OPV1, HBV1 and DPT1¹². The most outstanding reason for missing scheduled immunization in this study was lack of vaccine (s). However, the lack of vaccines as noted may be due to the inability of the health facility staff to forecast properly the vaccine needs of the centre, since there was no report of vaccine shortage in the country during the period of the study. The lowest coverage rate was recorded for tetanus toxoid dose 5 as, this was similarly reported in a study in Lahore district of Pakistan among mothers who had delivered within the previous 3 months, less than a quarter (17%) of the women had received a complete dose of TT 5 injections which is well below the WHO expected level of vaccination of 100% of the pregnant women.

Data management and reporting has been very poor in the past. However, attempts have been made to improve data quality and management system by capacity building of service providers and provision of data tools to all levels. A survey among 27 countries in 2002 to 2003 had reported some challenges in their immunization surveillance and monitoring system, such weakness includes; inconsistent use of monitoring charts, inadequate monitoring of vaccine stocks, injection supplies and adverse events, unsafe computer practices, and poor monitoring of completeness and timeliness of reporting¹³. This was similar to this report where vaccine and dry stock ledgers had not been available and there was no method for vaccine forecasting, also, records of vaccine-preventable diseases (VPDs) were not maintained. The clinic management ensures a good quality supply, equipment, and consumables, but there was no availability of stock supplies and consumables inventory unlike report made by the expanded programme on immuniza-

tion of the Republic of Myanmar (2012-2013) where logistics operations had been manned and maintained by dedicated staff at each level of storage and distribution, as stock management was computerized at the central cold room but done manually at regions and townships levels¹⁴. In 2010, the center for disease control (CDC) had developed a vaccine tracking system to facilitate vaccine ordering, inventory management, and related processes for publicly purchased vaccine¹⁵

There has not been any form of external funding for the clinic in the past 5 years unlike in Myanmar where most of the relevant supplies required for the immunization programme were supplied by UNICEF and WHO and the cost of the supply transport and storage up to the township level was borne by the government (Ministry of Health) which was the major reason for the success of the immunization programme (Central expanded programme on Immunization, (2012-2013) in this Republic. The report of a joint WHO/UNICEF mission on vaccine security in Nigeria had also indicated financial constraint due to poor financing of transportation cost of vaccines at the State and Local Government areas (LGAs), in addition to poor information management between states and LGAs and poor cold chain capacity amongst others⁷.

Conclusion

The clinic has come a long way in the provision and administration of immunizations and the clinic is doing well based on the available resources, but some issues have not been resolved.

Gaps and challenges

Few clinic activities were shown to be done improperly, as follows: There was no dropout monitoring chart, thus utilization and categorization could not be determined; There was no method of planning or forecasting for both vaccines, syringes, and safety boxes; There was no record of use of vaccines and syringes; The immunization status of children could not be determined from the immunization records; There was no record of VPDs, thus no way of determining if it was on the increase or other wise; and the monthly/yearly target of the clinic was too low.

Recommendations

There should be training of staff on planning, forecasting, and proper recording of immunizations. Standard immunization data tools including tally sheets, immunization registers, health facility summary sheet, immunization monitoring charts should be made available. Effort should be made towards computerizing immunization activities in the clinic using standard format. Out-reaches services should be conducted in line with the 1,2,3 strategy of the NPHCDA to further improve overall access to immunization in the hospital catchment

areas. Increase funding and personnel will be required for this. Analysis of the immunization performance should be done and reviewed on a monthly basis. Vaccines, especially DPT, should be available all the time. There should be regular supportive supervision of staff in the clinic to ensure the clinic is administering immunizations properly. The immunization register should be used to record vaccines given, to make it possible to calculate the proportion of children fully or partially immunized. There is a need to synchronize the national and clinic objectives for effectiveness and efficiency. Goals set for the clinic should be realistic, time bound and measurable.

Authors' contribution

All the authors were involved throughout the course of the study. Fatiregun A and Alonge T conceived the study. Initial draft was done by Fatiregun and approved by all authors.

Conflict of Interest: None

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