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Association between Hospital Management and Immunization Coverage at 3 National Hospitals of Kabul City, Afghanistan year 2017

**M. Phill Dissertation submitted to
PERIYAR UNIVERSITY**

In partial fulfillment of the requirements

For the award of the degree of

Master of Hospital Administration

BY

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Enrollment No: 16035352100002

MHA – Batch (2016-2018)

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Supervisor Consent

Consent letter from site supervisor

Date : 24, Feb 2018

To

The Head

Department of Public Health

Maulana Azad University

Jodhpur, Rajasthan, India.

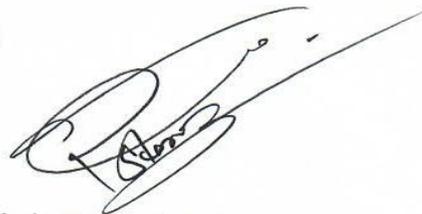
Sub: Consent Letter to be Site Supervisor for Research Project of Dr. Ghulam Dastagir Nazary undergoing MHA at Maulana Azad University.

Dear Madam,

This in reference the above mentioned subject. in this regard I wish to inform you that I am willing to accept Mr. Ghulam Dastagir Nazary as my student for guiding his project work **“Association between Hospital Management and Immunization Coverage at 3 National Hospital of Kabul City, Afghanistan”** leading to the completion of MHA fourth semester from Maulana Azad University, Jodhpur.

I will guide him for the entire duration of his project work and will supervise him throughout the project

Thanking you



Dr. Hedayatullah Stanekzai

Senior Advisor to Minister of Public Health of Afghanistan and PEI/EPI

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Table of Contents:

1.	Background:.....	9
2.1	Structure of the Hospital Sector:.....	10
3	Introduction:	11
4	Rationale:.....	13
5	Literature Review:	15
6	Research Question/Hypothesis:.....	21
6.1	General Question of the Study:.....	21
6.2	Specific questions:.....	21
7	Objective of the Study:	22
7.1	General Objective of the Study:	22
7.2	Specific Objectives of the Study:	22
8	Research Methodology:.....	22
8.1	Inclusion Criteria	22
8.2	Exclusion Criteria:.....	22
8.3	Scope of the Study:	22
8.4	Study Design	22
8.5	Study Population	23
8.6	Result	23
8.6.1	Indira Gandhi Children Hospital (IGCH):	23
8.6.2	Maiwand Teaching Hospital for Children (MTHC):	25
8.6.3	French Medical Institute for Children and Mothers (FMIC):.....	27
9	Ethical Consideration	29
10	Expected Benefits & Outcomes:	30
11	Discussion:.....	31
12	Limitations of the study	32
13	Conclusion:	33
14	References:.....	34
15	Annexes:	38
15.1	Checklist for scoring of hospital management in relation to EPI services	38
15.2	Scoring Category for ranking the hospitals	39



List of tables:

Table 1: Checklist for scoring of hospital management in relation to EPI services 23
Table 2 Provides brief summary about the scoring levels of the hospitals:..... 24
Table 3 Provides summary result of checklist filled from Maiwand Children Hospital: 25
Table 4 Provides summary of scoring based on the checklist filled from FMIC Children Hospital:
..... 27

List of Figures:

Figure 1 Levels of Care.....	11
Figure 2 shows penta3 % performance in 1396 (2017) in Indira Gandhi Hospital	25
Figure 3 shows penta3 % performance in 1396 (2017) in Maiwand Hospital	27
Figure 4 shows penta3 % performance in 1396 (2017) of FMIC Hospital	28

Research Summary

Objective: To determine the association between the national hospitals management, quality (technical) and EPI key indicators coverage.

Methodology: The study carried out in the 3 National Hospitals of Kabul City. the Indira Gandhi Children Hospital(IGCH) run by the Ministry of Public Health (MoPH), Maiwand Teaching Hospital run by the Ministry of Higher Education (MoHE) and French Medical Institute for Mother and Children (FMIC) run by Private entity. The data have been collected for 2017 complete year through a pre-developed checklist. Three hospitals were selected from 3 different management perspective under the government of Afghanistan. These hospitals are selected based on the availability of EPI services and data for eligible children and women.

Study Design: A cross sectional retrospective study is conducted in 3 national hospitals of Kabul city, Afghanistan. Hospital management will be divided into three categories (poor, good and excellent). Immunization coverage will be kept as continues variables measured by percentage. There is ranking score for hospital management if a hospital gets 0-49 score the hospital will be ranked poor management; if a hospital gets 50-69 score the hospital will be ranked as good management and if a hospital gets 70 or above score, the hospital will be ranked excellent management. Two types of checklist will be used for data collection, checklist one is the National Hospital Monitoring Checklist this will be used for measuring the technical quality and management of hospital for scoring and ranking hospitals. And the 2nd checklist will be developed and data will be collected to measure the perceive quality from the patient prospective. These combine score of both checklists will be the final score for any hospital and then the coverage for the 2017 for key indicators will be analyzed to see the association between management and coverage of EPI performance.

Conclusion: The study is conducted in 3 out of 26 national hospitals of Kabul city. We use specific checklist for assessing the management level of the hospital. The Penta 3 was the key indicator to see the association between the management of hospital and its effects on the performance of Penta3. The result of study in two out of 3 hospitals shows that there is strong association of management and the performance. In other words, the excellent management has great effects on the performance. This claim is further supported by the result of FMIC which got low score in management and has low performance in Penta 3 in past one year.

1. Background:

Afghanistan is a land-locked country in South-Central Asia, strategically located at the crossroads of major north-south and east-west trade routes. It occupies an area 652,225 square kilometers, with elevations ranging from 258 meters to 7,492 meters. The capital of the country is Kabul. The country is bounded by six different countries, namely, Pakistan, Iran, Tajikistan, Uzbekistan, Turkmenistan, and China. The longest country to border Afghanistan is Pakistan (at 2,430 kilometers), whereas the smallest is China at 76 kilometers (Blood, 2001, as cited AMS, 2010).

The international community mainly European Commission (EC), USAID, and the World Bank (WB), together with the Ministry of Public Health (MoPH), made efforts to rehabilitate Afghanistan's devastated health care system. A strategy to deliver a Basic Package of Health Services (BPHS) was developed in 2002 shortly after the establishment of the Transitional Islamic Republic of Afghanistan following the withdrawal of the Taliban, when the country recorded some of the worst health statistics in the world (MoPH, 2005).

The BPHS was adopted through various mechanisms, including Performance based Partnership Agreements (PPAs) of World Bank, Partnership Contract for Health services (PCH) of USAID and Performance Grant Contracts (PGC) of EU within the framework of government health policy.

One of the core values of the MoPH that, deliver cost –effectiveness interventions under the BPHS to address the primary health problems of the population, particularly the most vulnerable groups; women and children. Within the MoPH structure in 2003, a key part of the strategic process that massively enhanced the ability of the MoPH to manage many large NGO contracts was the establishment of the Grants and Contracts Management Unit (GCMU).

Consequently, EPHS was modeled in 2005 the essential package of hospital services is a complementary of the BPHS and delineate the hospital referral system necessary to support the BPHS (MoPH, 2005). The BPHS and EPHS represent clearly the content of the MoPH strategic program for service delivery in the country.

Hospitals in Kabul have generally not received financial or technical support and are losing "hearts and minds." The dismal state of hospital services contributes significantly to the mounting public criticism of the central government's inability to manage institutions and provide essential services.

Although Kabul hospitals suffer from severe resource shortages, organizational and structural problems are even more disabling. Unlike NGO run hospitals, National Hospitals have a total lack of control over resource allocation. Control and knowledge of resource costs and allocation is segregated from operational control at both the hospital level and at the Central Ministry. Lack of management capacity, institutional experience, and fundamental understanding of efficient function hampers any progress (Hospital Strategy, 2010).

As of 2017, there are, 26 national hospitals located in Kabul, 200 private health facilities (HMIS-MoPH, 2017). The health sector has made impressive progress toward set objectives since 2001 after implementation of the two strategies the BPHS and EPHS. The output indicators, such as the proportion of children immunized against measles, have seen considerable improvement in recent years. By the time of the last survey on child mortality, Afghanistan was four years ahead of the schedule set for the Millennium Development Goals (MDG) and on target to reduce under-5 mortality and three years ahead of the schedule set for the MDG on infant mortality reduction. Similarly, the rate of progress in measles vaccination has been faster than what had been projected when the Afghan MDG targets were set out.

Structure of the Hospital Sector:

Patient care is a complex process that is most efficiently and effectively accomplished by different levels of facilities providing appropriate levels of care. A basic principle is that care should be provided at the lowest level of facility that has the needed resources and medical personnel {MoPH, 2010, Health Sector Strategy for hospital}.

Terminology for health care services can be sometimes vague and confusing. In the interest of clarity and to assure that discussions of health services are consistent the following definitions

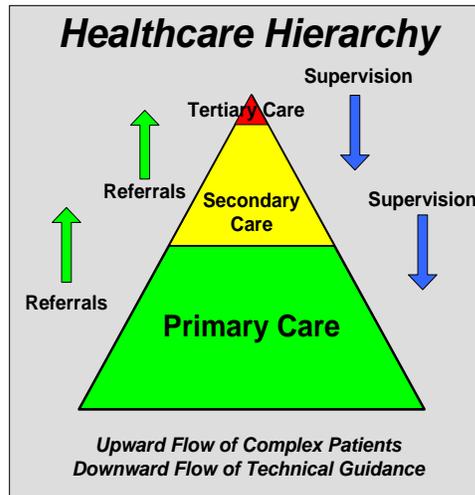


figure 1: adopted from Hospital Strategy Shows Levels of Care

will be used for the various levels of health care services:

Primary Care is the most basic level of service that is always carried out in the community, at a clinic, or on an outpatient basis at a hospital. Primary care includes basic curative services that provide treatment for non-complex illnesses and injuries. Preventive Services such as vaccinations and basic health and nutrition

education is also part of primary care.

Secondary Care is care of a higher level of sophistication than primary care and is carried out on an inpatient basis at a hospital. Most hospital inpatient services are considered secondary care.

Tertiary Care is the highest level of care in terms of medical complexity and technical difficulty which is administered to patients with complex diseases who may require high-risk pharmacologic regimens, surgical procedures, or high-cost high-tech resources. Tertiary care services are only available at the highest level of hospital such as a university hospital or a National or Specialty Hospital as it requires sophisticated technology, multiple specialists and subspecialists, a diagnostic support group, and intensive care facilities. (note – most services provided at National and Specialty Hospitals are at the secondary level)

Introduction:

The MoPH Hospital System is composed of four levels of facility; District Hospitals, Provincial Hospitals, Regional Hospitals, and National and Specialty Hospitals.

District Hospitals: The district hospital brings professional inpatient and emergency services closer to the population in rural areas. Its priority role in supplementing health centers aims at reducing the maternal mortality rate (MMR), infant mortality rate (IMR), and under-5 mortality (U5M). The District hospital is mainly an emergency hospital where patients are assessed, diagnosed, stabilized, and either treated or referred back to a lower level or referred to a higher level of health facility. Provision of 24-

hour comprehensive emergency obstetric care service is a crucial aspect of a District hospital. District hospitals are typically staffed by junior general medical officers.

Provincial Hospitals: The provincial hospital is the referral hospital for the provincial health system{MoPH, 2005, Essential Package of Hospital Services}. It offers the same clinical services as a district hospital as well as adding a few more sophisticated services for diagnosing and treating various conditions and is usually staffed by specialist doctors. In most cases, the provincial hospital is the last referral point for patients referred from the districts. In some instances, the provincial hospitals can refer patients to higher levels of care—to a regional hospital or to a National or Specialty Hospital in Kabul. The provincial hospital brings professional inpatient and emergency services closer to the population in rural areas.

Regional Hospitals: The regional hospital is primarily a referral hospital with a number of specialties for assessing, diagnosing, stabilizing and treating, or referring back to a lower-level hospital. The regional hospital provides professional inpatient and emergency services at a higher level than is available at district or provincial hospitals.

National and Specialty Hospitals: Hospitals at the fourth level (National and Specialty Hospitals) are intended to be referral centers for tertiary and secondary inpatient care and are located primarily in Kabul. They provide education and training for health workers and act as both referral hospitals for provincial and regional hospitals and as providers of all levels of inpatient care to residents in the capital city. National and Specialty Hospitals are required to conform to EPHS as a minimum level of care in each service area provided by the hospital. Advanced inpatient care (tertiary level) will be further covered by standards and protocols currently under development.

In addition to the MoPH Hospital System, other governmental hospitals are run by the Ministry of Education (medical school facilities), the Afghanistan National Army, and the Police. As these are the responsibility of other ministries they are not covered by this document.

Private Hospitals and Public/Private Partnership Hospitals are under the authority of the MoPH. As such they are covered by this document in a limited manner. With independent management structures these facilities are not subject to the MoPH restructuring efforts. They are however subject to MoPH regulation and quality supervision. As such they are covered under specific areas such as Licensing and Accreditation and Certificate of Need.

Rationale:

Hospitals are extremely complex structures which are challenging to run in even the best of circumstances. In the context of Afghanistan, the task of running hospitals that provide acceptable quality and quantity of services has proven beyond the means and resources of the Central Government.

The structure of the system in which hospitals must try to function has proven inadequate to the task of managing and maintaining the provision of health services. A human and financial resource poor Ministry of Public Health, despite the best efforts of its dedicated leadership and staff cannot provide the support that complex institutions require.

This problem of inadequate resources compounds an already sub-optimal system. World-wide experience has conclusively demonstrated that even in the best of circumstances a centrally managed and controlled hospital system is poorly suited to the needs of modern healthcare. The organizational complexity of hospitals, the diversity of services that must be provided and the constantly changing influx of people needing care requires a very high level of managerial and operational flexibility. It is literally the case that flexibility and the ability to respond rapidly to ever changing internal and external conditions make the difference between life and death.

The key point is that even if the government of Afghanistan attains a level of wealth where vital supplies are no longer in short supply, the inefficiencies of central command and control will remain.

The hospital sector has gone through several devastating systemic shocks including the management that have caused profound dysfunction. The Hospital Sector has been particularly vulnerable to these repeat assaults on structure, operations and management capacity because of the size and complexity of the institutions involved.

Over the past thirty years, there have been four traumatic occasions when government was radically altered and where management expertise and institutional memory were effectively eliminated. Each time a new system of government was established with a new cast of health sector leadership, a protracted period of on the job learning was necessary where a new group of ministry and hospital officials struggled to understand and gain control over the health system.

Meanwhile the primary health care services particularly the immunization services provision is a critical part of any level of the health facility including the national hospital. Furthermore, the childhood immunization is a cost effective public health strategy and Expanded Programme on Immunization (EPI) services have been provided in Afghanistan free of charges to all eligible Afghan children and women (O. Olumuyiwa, 2008). And is of one the core component of MoPH national strategy (MoPH, 2016-2020). Considerable progresses have been made worldwide in immunization performances, more than two million deaths are averted annually through immunization process globally. Smallpox has been eliminated and polio is on the edge of eradication via vaccination and immunization. Afghanistan and Pakistan are the only polio epidemic countries in world.

However, still a lot of work remains to do especially for improving routine immunization coverage as pallor for polio eradication. Based on the recent EPI coverage survey 51% of the children surveyed had received all the vaccinations, 30.7% of children aged 12-23 months' age were partially vaccinated and 18.3% never received any vaccination (CES 2013).

By specific antigen, 77.9% children had received BCG, 73.3% received Penta1, 59.7% received Penta 3 and 58.8% received measles vaccination before their second birthday. Fully immunized coverage is higher in urban areas than rural (61.8% vs 49%), but still the coverage of all antigen remain low (CES 2013). Further, intensive fight for polio eradication is going on and hopefully these countries will be polio free in near future. Polio campaigns negatively affected routine immunization in Afghanistan and Pakistan. Latest Demographic and Health Survey (2015) indicated a very low (46) percentage of fully immunized children in Afghanistan.

Immunization services are provided in health facilities via fixed, outreached and mobile strategies in Afghanistan. The quality of other health care services and the poor management system affects immunization directly and indirectly. We believe that the coverage of key indicators of immunization program is associated with the hospital management and quality of health services, however, the association between hospital management and immunization coverage has not been studied yet in Afghanistan context. Therefore, the aim of this study is to know the association between hospital management and immunization coverage at the national hospitals level in Kabul, Afghanistan.

Literature Review:

A cross-sectional survey was conducted in September 2006 in Nigeria, evaluated the knowledge of mothers of children aged 12–23 months and vaccination coverage {Odusanya, 2006, Determinants of vaccination coverage in rural Nigeria}. It was public private partnership (PPP) for almost 8 years and the coverage was 81%. The study revealed that the completeness of childhood vaccination was significantly correlated with knowledge of mothers. It further recommends if high coverage levels need to be sustained then adequate attention should be given to improve knowledge of mother. Furthermore, the immunization coverage for BCG, DPT, and OPV was above 80%. Because of the long interval between the third dose of DTP and measles, a number of children do not return for measles vaccine and this makes the coverage rate for this antigen to be lower than others in keeping with the reported pattern {Odusanya, 2006, Determinants of vaccination coverage in rural Nigeria}.

Another study was carried-out in Lao with the aim to explore factors affecting routine immunization coverage. The study was implemented between February to March of 2005, it was a cross-sectional survey, targeting 341 mothers living in two districts where immunization coverage was the lowest and the middle in Oudomxay province. The result of study shows that the DPT3 coverage was 72%, higher than the national target of 65%; with the drop-out rate of 21%. Mostly the affecting factors on fully immunized child was distance, literacy, possession of livestock; mother's knowledge of immunization target diseases, measles immunization schedule; and mother's willingness to pay for immunization. The study result recommends well primary health care activities in the district level to have much higher routine immunization coverage. In addition, the zone-zero social mobilization strategy and good lines of communications is also important improve the polio eradication initiative as well.

Furthermore “to control and eliminate the vaccine preventable diseases it is important to know the vaccination coverage and reasons for non-vaccination” recommend a study in Turkey {, 2006, Vaccination coverage and reasons for non-vaccination in a district of Istanbul}. The study was implemented with a primary objective to determine the complete vaccination rate; the reasons for non-vaccination and the predictors that influence vaccination of children. However, there was another objective for study to determine coverage of measles vaccination of the Measles Immunization Days (MID) 2005 for children aged 9 months to 6 years. However, reasons for non-vaccination were: access to the vaccination services limited knowledge about vaccination; the father of child didn't allow vaccination; undercurrent illness of child during vaccination time; missed opportunities like not to open

a vial for only one child. Additionally, in the logistic regression analysis, parents' levels of education and immigration time to Istanbul were found to influence whether children were completely vaccinated or non-vaccinated.

However, considering the result of the aforementioned studies in neighboring, and developing countries as well as other articles from widely looked to the socio demographic and economic factors which affected the vaccination coverage. No study has been found in the region to see association of the coverage of EPI key indicators with the management of health facility, particularly with the hospital management. Therefore, it will be the first study in nature in the country level as well as in the regional level to know wither the coverage of EPI key indicators is associated with management of hospital level.

Study conducted from November 2016 and Jan 2017 in India with the objectives to estimate the immunization status as per the National Immunization Schedule, and two to identify the socio-demographic profile influencing the immunization status of children under five years. The study result shows that majority of mothers (95.77%) were literate. Majority of the children (93.96%) were completely immunized. Sex of a child had no significant association with immunization coverage. Furthermore, the study had shown that there was a direct positive correlation of the higher socio-economic and literacy status of mothers/caregivers with the immunization coverage of children. Immunization coverage is found more in children delivered in hospitals/Govt. Institutes as compared to children delivered in homes.

In another study with the objective to explore if the adoption of national policies to use community-based health providers for the management of pneumonia and diarrhea is associated with the decline in under-five mortality, including achievement of the Millennium Development Goal (MDG)4 target, in high-burden countries. The study conducted in large setting covering the analysis from 75 high-burden low-income and middle-income countries which accounted for 98% of the 5.9 million global under-five deaths in 2015. One-fourth of these deaths were due to pneumonia and diarrhea.

The χ^2 tests and multiple regression analysis were used to examine the association between reduction in under-five mortality rates and community case management of pneumonia and diarrhea by adjusting for the influence of other possible determinants. And the result shown that countries that had adopted both Community case management (CCM) policies were three times more likely to achieve the MDG4 target than countries that did not have both policies in place. This association was further confirmed by the multivariate analysis (β -coefficient=10.4; 95% CI 2.4 to 18.5; p value=0.012).

A study in the United State was conducted with the aim to explore how having a medical home is associated with vaccination coverage among children eligible

for the program. A total of 24 514 children 19 to 35 months of age sampled by the National Immunization Survey. Children were considered to have a medical home if they had a doctor, nurse, or physician's assistant who provided them with ongoing routine care, including well-child care, preventive care, and sick care, according to their parents. The result of study shows that nationally, 44.9% of all children were Vaccine for Children (VFC) eligible and 93.0% of the VFC-eligible children received all vaccine doses at a provider enrolled in the VFC program. Compared with children who were not VFC eligible. However, among VFC-eligible children, children who had a medical home were significantly more likely to be Up-to-Date (UTD), compared with children who did not have a medical home (72.3% vs 63.5%).

Effective immunizations require a thorough, multi-step process, yet few studies comprehensively addressed issues around vaccination management. A cross sectional, web-based questionnaire survey was performed among 1157 primary physicians from North Rhine-Westphalia, Germany: a representative 10% random sample of general practitioners (n=946) and all teaching physicians from the University Duisburg-Essen (n=211). The objective was to assess variations in vaccination management and vaccination errors in primary care. The result show that more than 20% of the physicians participated in the survey. Good vaccination management was reached by 19% of the practices. Patient-related quality was good in 69% of the practices, vaccine-related quality in 73%, personnel-related quality in 59% and storage-related quality in 41% of the practices. No predictors for error reporting and good vaccination management were identified. In conclusion a good result was identified for vaccine- and patient-related quality but need to improve issues that revolve around vaccine storage.

In another study which focused in two geographical setting rural and urban immunization implementation for vaccinating populations within their geographic area. Considering the difference in performance of immunization coverage rates between geographic areas, a two-phase study was conducted, for e.g., in the first phase to identify the rural and urban areas that achieved the highest performance coverage, and then the qualities phase to know the factors accounts for high performance and continued the high performance increasingly. However, in this study the first phase is described, which was implemented in seven sites that achieved the largest increases in coverage from 2001 to 2004. The result of study delineated from 71 semi-structured key informant interviews with both internal staff and external partners at the located sites of the immunization programs. The qualitative result described that most of the challenges account for are included increasing reluctance among parents and overcoming barriers to accessing care.

Further a study carried out with the objective to know the child specific characteristics and the routine vaccination coverage levels in two different setting in the public and private provider's perspectives. The data have been compared for 1996 and 2004 and taken from the National Immunization Survey and

compared for children aged 19- to 35 months. The result describes that the proportion of child visited the private provider increased for e.g., 58%-61%) and the proportion visited public providers decreased by 19%-15%. However, overall the coverage proportion visiting private providers increased compared to visiting public providers.

A descriptive study was conducted in the US with the objective to characterize practices related to measuring influenza vaccination rates among healthcare personnel in US hospitals. The study was nonfederal based hospital, where patient keeps for short-stay and provide general medical and surgical services, the health care providers were surveyed base on the 2004the American Hospital Association Annual Survey Database. A self-administrative questionnaire was used for data collection, and the result elaborates, that

The response rate was 56% (i.e., 555 of 996 US hospitals responded to the questionnaire). Only 69% of hospitals measured vaccination rates (mean coverage rate, 55%). Most hospitals that measured coverage included employees (98%) in the vaccination rates, whereas contract staff (53%), credentialed medical staff (56%), volunteers (56%), and students and residents (30%) were less commonly included. Among hospitals measuring coverage, 44% included persons for which vaccine was contraindicated, and 51% included persons who refused vaccination.

Health issues are among the top priority challenges in governments' agendas. One important example is the vaccination of new born babies and young children a study was conducted in Jordon, to see the Automatic Management of Vaccination Process in Jordan. The rate for non-vaccination is much higher among communities in rural and remote regions. Information and Communications Technology can play an important role in assisting the government to manage the process and help reduce the rate of non-vaccination. In this paper, we describe a mobile system developed to electronically manage the vaccination process. Early evaluation demonstrates the benefits of such system in supporting government activities.

A study in India revealed that the risk of acquired hepatitis B virus (HBV) infection contacting to the blood of infected person or its contents was high amongst health care professionals, however there are health workers never got vaccines with the increasing risk of the virus. The main objective of the study is to know the prevalence and vaccination practices of HBV. For this total 2162 health workers screened-out for presence of HBV. In the result total 1198 (55.4%) were vaccinated and the remaining health workers had not been vaccinated. Therefore, the low

awareness amongst the health care providers is the main cause, and need immediate activity to increase the awareness.

Similarly, in India the study was planned to evaluate the coverage of hepatitis B vaccine and to study occupational, epidemiologic, and attitudinal factors in its acceptance among health care workers in a tertiary care hospital. It was a cross-sectional study conducted among HCWs of MM Institute of Medical sciences and Research. A self-designed, semi-structured interview schedule was used to collect data from the participants by interview method.

overall prevalence of hepatitis B vaccination acceptance was 60%. Only 40% of the health workers had received the full three dose vaccination schedule while 20% had received one or two doses, and 40% were unvaccinated. Protection against hepatitis B was cited the most common (54%) reason for taking this vaccine. The most important reasons for not taking the vaccine were negligence (41.6%), whereas the commonest (45%) ground cited for not taking the recommended number of dosage was the lack of knowledge about the total number of doses to be taken for full protection.

Coverage of complete immunization was low among health care workers. Level of knowledge regarding the disease was also not satisfactory. Vaccines should be made available free and mandatory in health organizations.

Additional a study was conducted in Assam in the North-East Region of India where the coverage of routine immunization is consistently evidenced low. The study looks after the factors affecting the immunization coverage in the first year of life of the children. The findings show that about 62.2% of the children were fully immunized. And lack of information among the parents was one of the major causes of drop out of vaccinations. The children from urban areas and mother's education level showed significant role in immunization coverage. Improvement in female literacy coupled with the reduction in the drop-out rate would add to achieve a higher target of immunization among children in the study area.

In Nepal a study was conducted in 2015 with the objective to describe the status and its determinants of immunization coverage

The study utilized data from the Demographic Health Surveys of India, Bangladesh and Nepal. The principal component analysis (PCA) method was used to compute the wealth index. Further the multivariate logistic regression model was utilized to access the status and factors associated with immunisation coverage. The result of study shown 43.6% of children were fully immunized in India while 85% were fully immunized in Nepal and Bangladesh. The variation was widely noticed in terms of

socioeconomic and demographic factors. However, mother's education and wealth index appeared as the significant confounding factors of full immunization coverage. Children belonging to the higher educated and rich families were more likely to be fully immunised.

In Afghanistan in 2017 a study was carried out with the aim to examine the structure and behavior of Afghanistan's routine childhood immunization system by using system dynamics modeling. Furthermore, the purpose of the paper was to demonstrate how public health and systems science methods can be combined to examine the structure and behavior of Afghanistan's routine childhood immunization system to identify the pathways through which health system readiness to deliver vaccination services may extend beyond immunization outcomes. Meanwhile the data are from annual health facility assessments and two cross-sectional household surveys.

The findings showed the readiness and demand-side components were associated with improved immunization coverage. The routine immunization system was mapped using four interlinking readiness subsystems. In the System Dynamic (SD) model, health worker capacity and demand-side factors significantly affected maternal health service coverage. System readiness components affected their future measures mostly negatively, which may indicate that the reinforcing feedback drives current system-structured behavior.

In Zhejiang province of China a study was implemented to see the routine vaccination coverage in children aged 1-7 years. The main objective of the study was to evaluate the coverage, completeness and timeliness of routine vaccination among children aged 1–7 years the Demographic information and immunization records of 4613160 children born from Jan 1, 2010 to Dec 31, 2016 were extracted from Zhejiang provincial immunization information system (ZJIIS) on Dec 31, 2017.

Vaccination coverage for each vaccine dose and completeness of different vaccine series were calculated by birth cohort, immigration status, and geographic area. The timeliness of vaccine doses scheduled before 12 months of age for the 2016 birth cohort was also examined.

Findings showed the coverage of all the vaccine doses scheduled before 12 months of age and its completeness reached the target goal of 90%. The coverage and completeness decreased substantially in vaccinations scheduled after 12 months old, and most of them were below 90%. Despite high coverage rates for all antigens by age 12 months, there was a very large range of

percent of vaccination delay when comparing different antigens scheduled in the first year of life for the 2016 birth cohort

In India a study was conducted to see the determinants of childhood immunization coverage in urban poor settlements of Delhi. This was a cross-sectional study mainly the study looked after information on complete childhood immunisation coverage among the urban poor, and explores its household and neighborhood-level determinants. The study randomly selected 1849 children aged 1–3.5 years from 13 451 households in 39 clusters (cluster defined as area covered by a community health worker) in 2 large urban poor settlements. Out of these, 1343 completed the survey. Further the information was collected regarding childhood immunisation (BCG, oral polio vaccine, diphtheria–pertussis–tetanus vaccine, hepatitis B and measles) from vaccination cards or mothers' recall. A random intercept logistic regression model was used to explore the sociodemographic determinants of complete immunisation.

The result showed that the complete immunisation coverage was 46.7% while 7.5% were not immunised. The odds of complete vaccination (OR, 95% CI) were lower in female children (0.70 (0.55 to 0.89)) and Muslim households (0.65 (0.45 to 0.94)). The odds of complete vaccination were higher if the mother was literate (1.6 (1.15 to 2.16)), if the child was born within the city (2.7 (1.97 to 3.65)), in a health facility (1.5 (1.19 to 2.02)), belonged to the highest wealth quintile (compared with the poorest; 2.46 (1.5 to 4.02)) or possessed a birth certificate (1.40 (1.03 to 1.91)). Cluster effect due to unmeasured neighborhood factors expressed as median OR was 1.32.

Research Question/Hypothesis:

General Question of the Study:

Is there any association between the hospital management, quality and the vaccine coverage?

Specific questions:

- Is there any association between hospitals management and EPI key indicators coverage?
- Is there any association between quality of EPI services and the key indicators coverage?

Objective of the Study:

General Objective of the Study:

To determine the association between the national hospitals management, quality and EPI key indicators coverage.

Specific Objectives of the Study:

- To determine the association between national hospital management and EPI key indicators coverage
- To determine the association between quality of EPI services and the EPI key indicators coverage

Research Methodology:

Inclusion Criteria

Three national hospitals which have immunization and children services in overall structure are included in the study sample. Further all under one children are included especially considering the data availability and good documentation at the hospital level.

Exclusion Criteria:

We have not included all the 26 national hospitals in the study, because of the data availability. Children with age two years and above are excluded from the data collection, these are not the target group for routine immunization as well as not come under the definition of the fully immunized children.

Scope of the Study:

The study is carried out in the 3 national hospitals of Kabul City; the data are collected for 2017 complete year. Three National hospitals from 3 different management authority of the government of Afghanistan were selected for e.g., the Indira Gandhi Children Hospital run by the Ministry of Public Health (MoPH), Maiwand Teaching Hospital run by the Ministry of Higher Education (MoHE) and French Medical Institute for mother and Children (FMIC) run by the Private agency. These hospitals are selected based on the availability of EPI services and data for eligible children and women.

Study Design

A cross sectional retrospective study is conducted in 3 national hospitals of Kabul city, Afghanistan. Hospital management are divided into three categories (Poor, Good and Excellent Management).

Immunization coverage kept as continues variables measured by percentage. There are ranking scores for the hospital management if a hospital gets 0-49 score the hospital will be ranked Poor Management; if a hospital gets 50-69 score the hospital is ranked as Good Management and if a hospital gets 70 or above score, the hospital is ranked with the Excellent Management. A specific checklist is used for the data collection for measuring the technical quality and management of the hospital for scoring and ranking the hospitals. Meanwhile, the performance coverage of key indicator (Penta3) for the year 2017 is considered and analyzed to see the association between the Hospital Management and the Penta 3 coverage.

Study Population

All 26 national hospitals of Kabul city considered as the total population. Out of these a sample of 3 national hospitals are purposively selected for the study to see how coverage of the EPI key indicator (Penta 3) for year 2017 have association with the hospital management.

Result

A pre developed checklist was used for the data collection each question marked 10 points if the answer is yes otherwise zero. Penta 3 considered as a key and in-dependent indicator to see how the management affects the performance of Penta3 or to see is there any association between the management of hospital and the performance. Below results stage for each hospital:

Indira Gandhi Children Hospital (IGCH):

Indira Gandhi Children's Hospital, established in 1976, is a large pediatric hospital located at District 10 Kabul's Wazir Akbar Khan neighborhood. As per the filled checklist the result of data analyses presented as follows:

Table 1: Checklist for scoring of hospital management in relation to EPI services

Scoring of Indira Gandhi Hospital Management in Relation to EPI Services		
No	Questions	Hospital Score
1	Availability of doctors:	10
2	Availability of midwife:	0
3	Availability of vaccinators:	10
4	Availability of vaccines	10

5	Availability of dry supply:	8
6	follow up on dropouts	10
7	Involvement of vaccinator in the morning meeting	10
8	Number of supervision of vaccination room from hospital managers side	10
9	Data reporting	10
10	Refresher training of Vaccinators	10
Total Score (%)		88
Inference		Excellent Management

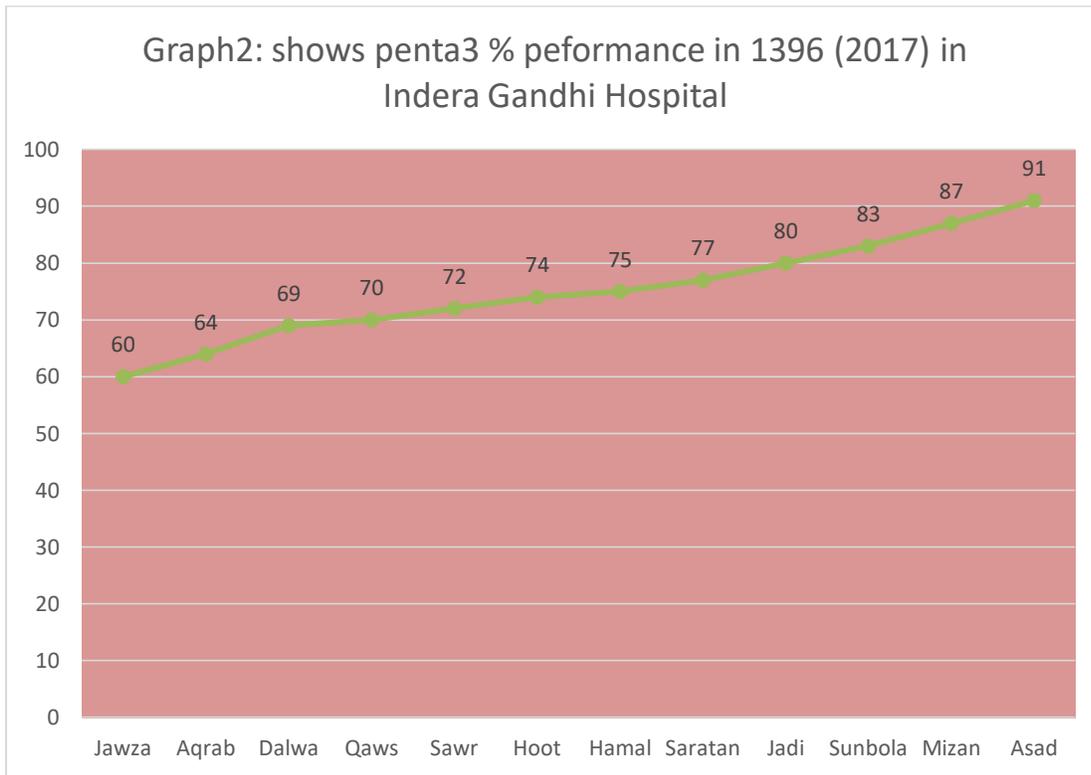
The table 1 in above presents the overall score 88 achieved by the hospital out of 100 the total score. Each question got 10 score if the answer is yes, in the opposite the hospital will get zero score if the answer is no or not follow the standard for that specific question. As per the pre identification of the scoring level for the hospital if the hospital total score is between 0-49 the hospital ranked as a Poor Management. If the hospital score is between 50-69 the management of hospital is ranked as the Good Management, if the total score is 70 or above the hospital ranked the Excellent Management. Below

Table 2 Provides brief summary about the scoring levels of the hospitals:

Serial Number	Scoring [out of 100]	Inference
1	0-49	Poor management
2	50-69	Good management
3	70 and above	Excellent management

The management of the hospital is linked with key EPI indicator performance in this case Penta3. Below graph 1 shows trend of Penta3 for the past one-year (2017). The data trend indicates 12 months' performance which gradually increased to almost 91% and the management of hospital got 88 score and categorized as an Excellent Management so there is association between the performance of hospital for key indicators and the management. Below graph provides trend for Penta 3 performance in past one year:

Figure 2 shows penta3 % performance in 1396 (2017) in Indira Gandhi Hospital



Maiwand Teaching Hospital for Children (MTHC):

Maiwand Hospital was established in 1939 as a teaching hospital. The hospital is located in Kabul’s District 2. The hospital currently offers Pediatric Care, Plastic Surgery, Dermatology and ENT services. Maiwand serves as a teaching hospital for the Kabul Medical University students under the Ministry of Higher Education. The result of data analyses is presented as follows:

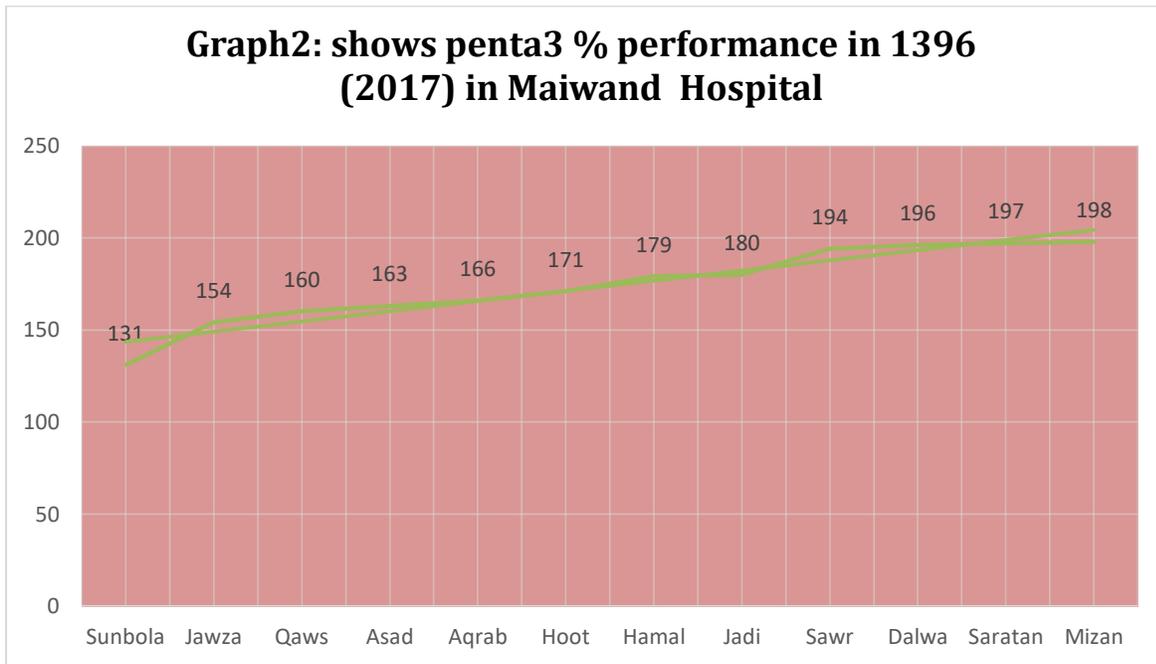
Table 3 below provides scoring details of Maiwand Hospital as per the filled checklist from the management prospective. The hospital got overall score 88 out of 100 and therefore, it categorized as an Excellent Management level and the graph is illustrated to show us the performance of Penta 3 in past one year for 2017 or 1396 complete year. The trend shows that overall performance is above 100% in past 12 months. It indicates that the performance is associated with the management because management got high scoring and performance got high score as well, therefore the excellent management leads to high performance in Maiwand Hospital.

Table 3 Provides summary result of checklist filled from Maiwand Children Hospital:

Scoring of Indira Gandhi Hospital Management in Relation to EPI Services

No	Questions	Hospital Score
1	Availability of doctors:	10
2	Availability of midwife:	0
3	Availability of vaccinators:	10
4	Availability of vaccines	10
5	Availability of dry supply:	8
6	follow up on dropouts	10
7	Involvement of vaccinator in the morning meeting	10
8	Number of supervision of vaccination room from hospital managers side	10
9	Data reporting	10
10	Refresher training of Vaccinators	10
Total Score (%)		88
Inference		Excellent Management

Figure 3 shows penta3 % performance in 1396 (2017) in Maiwand Hospital



French Medical Institute for Children and Mothers (FMIC):

FMIC is a children’s hospital, located in part 3 of the Kabul city. Established in 2005, it is a joint project of the government of France, Afghanistan, The Aga Khan Development Network and the French NGO. The result of data analyses is presented as follows:

Table 4 Provides summary of scoring based on the checklist filled from FMIC Children Hospital:

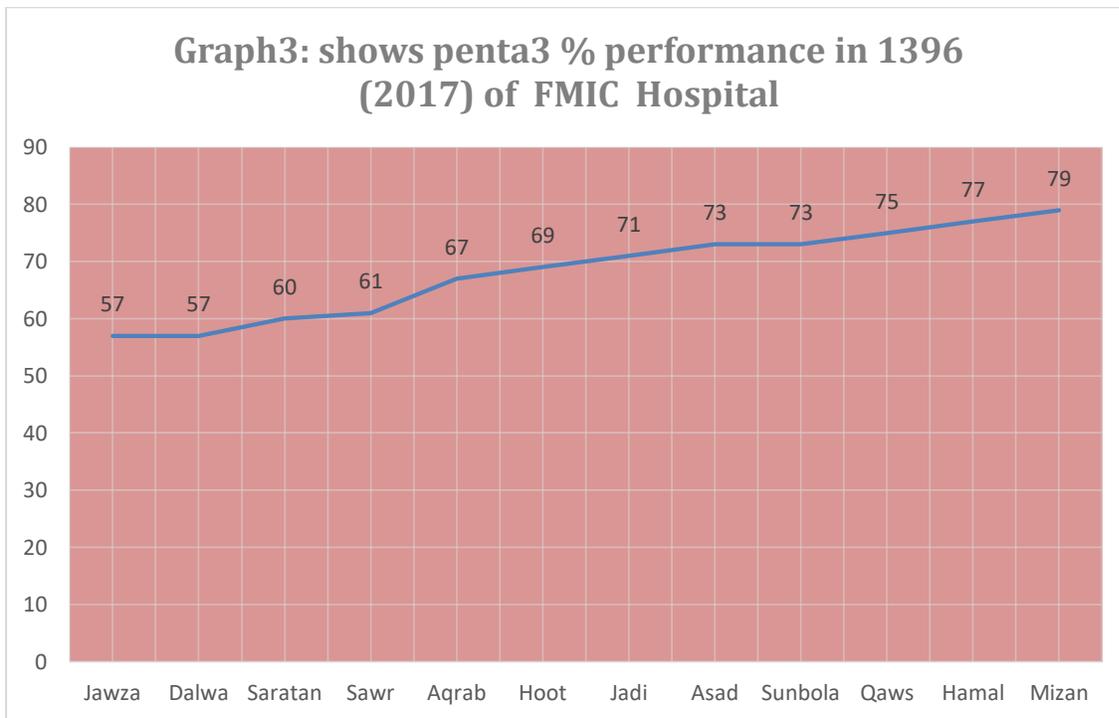
Scoring of Indira Gandhi Hospital Management in Relation to EPI Services

No	Questions	Hospital Score
1	Availability of doctors:	10
2	Availability of midwife:	0
3	Availability of vaccinators:	10
4	Availability of vaccines	10
5	Availability of dry supply:	5
6	follow up on dropouts	0
7	Involvement of vaccinator in the morning meeting	0

8	Number of supervision of vaccination room from hospital managers side	10
9	Data reporting	10
10	Refresher training of Vaccinators	10
Total Score (%)		65
Inference		Good Management

Table 4 in above provides scoring details of FMIC hospital, the Hospital Management got low score compared to other two hospitals the total score got by the hospital is 65 out of 100 and categorized as Good Management. Low score in Management leads to low performance in Penta3 in past one year of 2017. Below graph is for more information about the trend of Penta3 of FMIC.

Figure 4 shows penta3 % performance in 1396 (2017) of FMIC Hospital



Ethical Consideration

We collected the secondary data from the hospital registers and documents. There was no primary data collection and no intervention on the clients' side. Therefore, we do not need to get the approval of Intuitional Review Board of the Afghanistan IRB.

Expected Benefits & Outcomes:

Hospital sector is the costly and most expensive part of the health system around 40% of all health system expenditure is happened in the hospital (NHA 2014). Any improvement will impact greatly to save unnecessary expenditure. However, this is a first study in nature; no study has been conducted before with such characteristic in the context of Afghanistan. The result of study will lead the National EPI program to know how the coverage of EPI key indicators associated with the management of hospital. Effective management system is needed for any organization to ensure efficiency and avoid wasting of scare resources. It will further allow us to know the weak points of management in hospital and make plan for improvement. Further the result will help the hospital management to use resources effectively and efficiently for the future sustainability in the program and will build the trust of the clients which is lacking currently in health and the hospital system as whole.

Discussion:

The findings confirmed that the Management of hospital has great role on the performance of EPI indicator and quality improvement as well. The Excellent management has great impact on the indicators performance especially in this case the Penta3 performance and linked high performance with management.

Considering the result of two hospitals the Indira Gandhi and Maiwand Teaching Hospitals, there is high performance and excellent management. These 3 hospitals are large National Hospital at Kabul providing mixed health services including the children care and EPI as well.

Moreover, these hospitals run by 3 different management authorities for e.g., Indira Gandhi is under the Ministry of Public Health Management, Maiwand is run by the Ministry of Higher Education, while FMIC is managing by a private entity with slight support from the Ministry of Public Health. Excellent management lead to excellent performance and there is association between the management of hospital and the performance a good example could be the two hospitals, while poor management leads to poor performance as an example of FMIC.

However, the findings of study could not be reflected to the national level as this study conducted in 3 hospitals of Kabul only. Therefore, there is need for further study to be conducted in a large scale for generalization of study result.

Limitations of the study

- We got few data from the French Medical Institute for Children and mothers (FMIC). The hospital management team was not ready to provide us the required data as per the checklist,
- Data from Maiwand hospital in past one year is showing over 100% performance which is deemed for low quality or over reporting,
- The study was conducted in limited number of the hospitals totally in 3 national hospitals were included, while there are total 26 National Hospitals in Kabul city, therefore, the result may not be generalizable.

Conclusion:

The study is conducted in 3 out of 26 national hospitals of Kabul city. We used specific checklist for assessing the management level of the hospital. The Penta 3 was the key indicator to see the association between the management of hospital and its effects on the performance of Penta3 in 2017. The result of study in tow out of 3 hospitals shows that there is strong association of good management and the performance of EPI key indicator. In other words, the excellent management has great effects on the performance. This claim is further supported by the result of third hospital (the FMIC) which got low score in management and has low performance in Penta 3 in past one year (2017). Considering the result of other studies in literatures there was no study with such specific objectives, however there were many other studies the association of age, economic status and other demographic characteristics associated with coverage. Coverage of routine immunization is high in Urban inhabitants compared to rural. Similarly, the children living in good economic households are have high coverage compared children living in poor families.

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Annexes:**Checklist for scoring of hospital management in relation to EPI services**

{(The data are required for the past one year 1396 (2017))}

SN	Questions	Status/Remarks
Each question has 10 marks in case of yes otherwise zero		
1	availability of doctors: () A: doctor patient Ratio _____ B: doctor nurse ratio _____	
2	Availability of midwife: () A: number of delivery to midwife ratio _____ B: Number of midwife to gynecologist _____	
3	availability of vaccinators: () A: Child to vaccinator ratio _____ B: Duty hours of vaccinator _____	
4	Availability of vaccines (<i>see for all antigens</i>)	1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.
5	Availability of dry supply: A: Syringe _____ B: Alcohol patch _____ C: Safety Box _____ D: Registers _____ E: Tally sheet _____	
6	follow up on dropouts	1. Hamal 2. Sawar, 3. Jawza, 4. Sartan 5. Asad, 6. Sunbula, 7. Mizan 8. Aqrab, 9. Qaws,

		10. Jaddi 11. Dalwa 12. Hoot
7	Involvement of vaccinator in the morning meeting { <i>see attendance of vaccinator from MM attendance sheet</i> }	
8	Number of supervision of vaccination room from hospital managers side	
9	Data reporting (<i>Pent3 for year 1396 monthly wise</i>)	13. Hamal 14. Sawar, 15. Jawza, 16. Sartan 17. Asad, 18. Sunbula, 19. Mizan 20. Aqrab, 21. Qaws, 22. Jaddi 23. Dalwa 24. Hoot
10	Refresher training of Vaccinators (<i>date and frequency in 1396</i>)	

Scoring Category for ranking the hospitals

Serial Number	Scoring [out of 100]	Inference
1	0-49	Poor management
2	50-69	Good management
3	70 and above	Excellent management