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Data Quality Review For Universal Health Coverage - Service Coverage Index In The West Bank: The Reproductive, Maternal, Newborn And Child Health

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This thesis was submitted in partial fulfillment of the requirements for the Master's degree in Health Informatics
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Declaration

This thesis was submitted in partial fulfilment of the requirement for the Master's degree in Heath Informatics.

I declare that the content of this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

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Signature:

Date: 09 / March /2021

Dedication

I would like to dedicate this thesis to:

My God Allah, my Creator and my Master;

The prophet Mohammed (peace be upon him), who was the first teacher of our life;

My father who has taught me everything, he is my mentor and my inspiration;

My beloved mother whose support, encouragement and prayers make me able to have such success;

My beloved brother and sisters who always wish me the best;

My beloved friends and colleagues who encouraged, helped and facilitated my path in education;

To all the people in my life, to the precious Palestine, I dedicate this research.

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Abstract

Background: In 2015, the United Nation Member States adopted the 2030 agenda for Sustainable Development. The third goal in the Sustainable Development Goals is "Good Health and Well Being" and the related indicator of interest to our study is the sub-indicator # 3.8.1 that measures the coverage of essential health services. As a measure for that sub-indicator, the Universal Health Coverage (UHC) Service Coverage Index (SCI) was created, which includes 14 tracer indicators on which data is periodically collected on a country-by-country basis. The essential health service category that has been considered in this research is Reproductive, Maternal, Newborn and Child Health (RMNCH), and the tracer indicators for this category are: (1) family planning, (2) pregnancy and childbirth care, and (3) child immunization. Which complies with ninth priority in the Palestinian national policy agenda "Quality Health Care for All"(The Palestinian Prime Minister Office, 2016).

Objectives: Our study aims to investigate the quality of the available electronic data and data resources in RMNCH in Palestine, conduct the data quality review domains in a scientific way, measure the RMNCH tracer indicators from the available electronic data, and to assess the challenges and barriers for establishing a Palestinian UHC – SCI for the RMNCH category. This study will establish the foundation for policy and decision makers to enhance the data quality of the RMNCH tracer indicators based on scientific methodology and pave the way to assess and calculate the other UHC-SCI indicators.

Methods: A retrospective Data quality review of the electronic data in the Palestinian Ministry of Health - Health Management Information Systems was undertaken. Data Quality

domains: (1) completeness and timeliness of reporting, (2) internal consistency of reported data, (3) external consistency of reported data, and (4) external consistency with population data were assessed using the WHO Data Quality Review (DQR) toolkit.

In addition, electronic data was collected from service providers to calculate the tracer indicators of the RMNCH category toward constructing a UHC-SCI in Palestine.

Results: Our study reported important results regarding the data quality of the RMNCH. The completeness and timeliness of reporting was 100% for the three tracer indicators; family planning, pregnancy and childbirth care, and child immunization. Regarding the internal consistency over time, it was highly consistent for the child immunization tracer indicator. However, family planning and pregnancy and childbirth care showed a poor internal consistency and less coverage over time with the mean of the three preceding years. Regarding the external consistency of reported data, we were unable to assess due to a lack of needed data from the Palestinian Central Bureau of Statistics to compare it with the health management information systems data in the Palestinian Ministry of Health (MOH). Finally, the external consistency with population data showed a good agreement with the United Nations projections.

Conclusions: Family planning, pregnancy, childbirth care tracer indicators need more focus and enhancements and periodic assessments need to be conducted to enhance services at the national level. Involving all stakeholders in a national action plan will fill the gaps in capturing indicators on these programs.

The UHC SCI can be measured and assessed using the WHO DQR toolkit. However, the Palestinian MOH should place a greater emphasis on establishing a good Palestinian UHC SCI and reach the Sustainable Development Goal of “Good Health and Well Being”.

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List of Abbreviations

DHIS2	District Health Information Software 2
DHS	Demographic and Health Survey
DQR	Data Quality Review
DTP	Diphtheria-Tetanus-Pertussis
EMR	Eastern Mediterranean Region
EPI	Expanded Program on Immunization
HDQF	Health Data Quality Framework
HIS	Health Information System
HMISs	Health Management Information Systems
HWC	Health Work Committee
IMR	Infant Mortality Rate
IUD	Intrauterine Device
LMIC	Low Middle Income Countries
MARACUM	Medical Informatics in Research and Care in University Medicine
MCH	Mother and Childhood
MICS	Multiple Indicator Cluster Survey
MMS	Military Medical Services
MOH	Ministry of Health
MOI	Ministry of Interior
NGO	non-governmental organizations
PCBS	Palestinian Central Bureau of Statistics

PFPPA	Palestinian Family Planning and Protection Association
PHC	Primary Health Care
PHIC	Palestinian Health Information Center
PNIPH	Palestinian National Institute of Public Health
RMNCH	Reproductive, Maternal, Newborn and Child Health
SCI	Service Coverage Index
SD	Sustainable Development
SD	standard deviation
SDG	Sustainable Development Goal
UHC	Universal Health Coverage
UN	United Nations
UNFPA	United Nation Population Fund
UNICEF	United Nations Children's Fund
UNRWA	The United Nations Relief and Works Agency
USAID	United States Agency for International Development
WHO	World Health Organization

CHAPTER ONE: INTRODUCTION

1.1 Background

In 2015, the United Nations (UN) Member States adopted the 2030 agenda for Sustainable Development (SD). The SD agenda ensured that all people enjoy peace and prosperity by 2030 defining 17 Sustainable Development Goals (SDGs), as shown in Figure (1).

Figure 1: Sustainable Development Goals (SDGs)

(World Health Organization & The World Bank, 2015)

The third goal in the SDGs is “Good Health and Well Being”. Ensuring healthy lives and promoting the well-being at all ages is essential to sustainable development (WHO, 2010).

One of the most crucial topics in health is to achieve universal health coverage (UHC). UHC is defined as conditions in which “*all individuals and communities receive the services they need without suffering financial hardship. It includes the full spectrum of essential, quality health services, from health promotion to prevention, treatment, rehabilitation, and palliative care*” (WHO, 2020d). Recently, in October 2019, the General Assembly of the United Nations made a political declaration of recommitment to achieving worldwide UHC by 2030 (UN, 2015).

In Palestine, quality health care for all is the ninth national priority of the national policy agenda 2017 – 2022. Two national policies were chosen to support quality health care for all; better health care services and improving citizens’ health and well-being. Many interventions were adopted to achieve these policies, which are; enhance the public health insurance system, ensure the financial sustainability of the health systems, improve the quality of health services through enhancing equipment, infrastructure, drugs, training of health care workers, IT and standards, and increase equitable access to health care Services. (The Palestinian Prime Minister Office, 2016) The Palestinian Ministry of Health (MOH) signed the International Health Partnership for Universal Health Coverage (UHC2030) in September 2018, reiterating the political commitment for UHC in Palestine. The MOH further confirmed that UHC is a priority on numerous occasions, underlining the importance of health system strengthening in order to make progress towards UHC. The MOH highlighted a special focus on efforts to strengthen Primary Health Care (PHC) through the family practice approach,

continuous quality improvement of services, evidence-based health services planning and health financing reform with an emphasis on sustainable health financing and social health insurance. The Palestinian Authority has also expanded the engagement with civil society to foster multi-sectorial partnerships and inter-ministerial collaboration to achieve UHC and the health-related SDGs, which recently translated into the establishment of a national health committee and renewed links with the Palestinian Health Policy Forum and other stakeholders based on internal document in the Palestinian MOH.

Within this context, the MOH is collaborating with many partners to progress towards UHC, including the World Health Organization (WHO), the Palestinian National Institute of Public Health (PNIPH, a WHO project) and the World Bank with agreed strategic priorities to strengthening the health system through sustainable health financing, improved service delivery (family medicine), health workforce development and strengthening of health information systems. The World Bank, in its mission in August 2019 regarding promoting UHC in Palestine, held comprehensive meetings with stakeholders regarding UHC. More recently, the Palestinian government established a National Health Committee and four sub-committees. The general director of public health in the Palestinian MOH, who is a member of one of these committees, ensured that the aim of these committees is to review the health system challenges and provide specific recommendations on how to best enhance progress towards UHC.

Many data sources needed for the UHC index are available from hospitals and other PHC facilities (governmental and private), The United Nations Relief and Works Agency (UNRWA) healthcare services, Palestinian military medical services (PMMS), non-

governmental organizations (NGOs) in the health sector, insurance companies and the Palestinian Central Bureau of Statistics (PCBS). However, Palestinians need to establish the Palestinian UHC index in official way.

Addressing the international parties with clear indicators regarding UHC will encourage them to allocate more funding for Palestine. In addition, UHC indicators transparently reflect the health status at the national level. Therefore, huge efforts are needed to construct the Palestinian UHC index.

Good health & well-being (SDG 3), as all SDGs, consists of many targets; these targets include indicators to capture the health status at national levels; these indicators together are used to calculate the UHC index for any country. The target 3.8, which is "*Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all*"(WHO, 2020d), is used to track achieving UHC. This target contains the following two sub-indicators to measure the achievement of Indicator 3.8 - UHC: (1) Indicator 3.8.1: Health coverage, and (2) Indicator 3.8.2: catastrophic spending on health.

WHO uses fourteen essential tracer indicators to define indicator 3.8.1 (health coverage). These fourteen essential tracer indicators are divided into four categories as indicators of the level and equity of health coverage in countries that are: (1) Reproductive, Maternal, New born and Child Health (RMNCH), (2) Infectious diseases, (3) Non-communicable diseases, and (4) Service capacity and access.

This study investigated which electronic data are available in inter-ministerial databases to map them with the available three tracer indicators inside the first of the categories mentioned above (RMNCH) toward constructing a Palestinian UHC Service Coverage Index (SCI).

As a first step, the study mapped electronic data in the RMNCH category since this category's indicators are captured through many systems in the MOH such as the Mother and Childhood (MCH) e-Registry running in PHC clinics, the AviCenna Health Information System (HIS) running in governmental hospitals and other stakeholders' systems (i.e. the Ministry of Interior (MOI) and PCBS).

1.2 Significance of the Study

To date, according to a comprehensive literature review, no study has been conducted in either Palestine or in the Middle East that addresses the UHC health coverage index indicators based on electronic data systems and investigates the data quality of its tracer indicators. This study will provide the first stable foundation that will fill a gap using a scientific approach toward data quality review of the UHC - health coverage index. The head of the Health System Department in the WHO Eastern Mediterranean Region Office (EMRO) ensured that the toolkit that was used in checking the data quality of UHC SCI tracer indicators addresses governments that do not publish its data for quality review. This is why it is difficult to find any literature about it. It also gives enlightenment about the interoperability needed between and among private and governmental sectors, and more integration that is inter-ministerial to improve health outcomes at the national level. The indicators of UHC will give decision-makers, stakeholders and donors better health status data that can highlight areas that need improvement.

1.3 Problem Statement

There is no clear policy about the feasibility of capturing and monitoring UHC - health coverage indicators. Moreover, there is no official production of the UHC - SCI in Palestine. It is very important to specify the electronic data that are available in inter-ministerial databases to map them with the available three tracer indicators inside the RMNCH category in order to construct a Palestinian UHC – Health coverage index.

To enhance decision making in RMNCH, reliable data is needed to represent the actual status. Therefore, it is necessary to check the data quality of RMNCH on a periodic basis. There has been no scientific study about the quality of RMNCH using a validated toolkit to investigate the data quality of the RMNCH category.

The gap in research in this area makes it rich for research. The results of this research will be the baseline for many future research studies for other indicators for UHC SCI. Moreover, the lack of research that uses the toolkit used in this research in the MENA region makes it a good foundation for future research in the region.

1.4 Aim of the Study

Map the available electronic data to capture UHC - health coverage index in the RMNCH category in Palestine. Determine the resources of data needed to calculate the UHC SCI in the RMNCH category, and review the data quality of the three indicators of RMNCH.

1.5 Study Objectives

Specific Objectives:

To map and investigate the data quality of the available electronic data for the UHC – SCI RMNCH category in Palestine.

Secondary Objectives:

- To assess the challenges and barriers to establishing a UHC - SCI of the RMNCH category in Palestine.
- To define what is needed to capture UHC – SCI of the RMNCH category in Palestine.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The literature review chapter states topics that are needed to be considered regarding UHC. It also presents previous works, articles, journals and publications related to achieving UHC in Palestine. This chapter also discusses family planning, pregnancy and childbirth care, child immunization and child treatment related to UHC, as well as previous work related to RMNCH, and describes data availability, reliability and quality.

2.2 UHC

UHC comprises main components: quality, essential health service coverage and financial coverage –extended to the whole population. Three dimensions – (effective) health services, finance, and population – are typically represented in what has come to be known as the coverage cube. In 2005, WHO members around the world committed to develop their health financing systems. In this development process three fundemental issues raised: how to finance health systems? How to protect people from health financial hardship? And how to optimize the available resources for health systems?(Evans & Etienne, 2010)

These three issue illustrated the need of categorizing the health systems financing into three dimensions;

(1) Population coverd by health services. Health for all is the core of UHC, considering the proportion of pooor people among the citizens is important for defining the benificiaries of health services.

(2) Cost of services. The critical line between voluntary and compulsary insurance in health systems, ayments and prepayments and other related financing issues are crucial to health systems.

(3) Services to be covered. Prioritizing services to be available based on the national health strategy taking in consideration the availability and quality of servece is the third dimension.

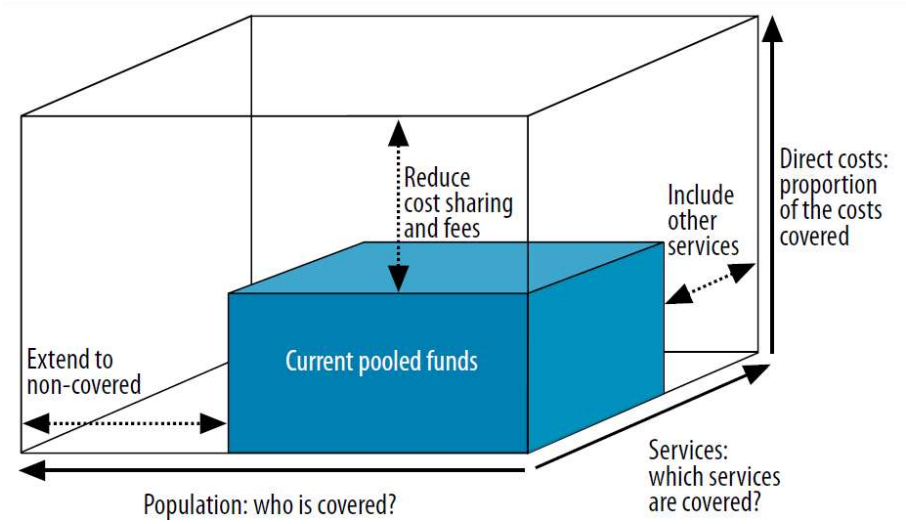

Figure 2: Three dimensions to consider when moving towards universal coverage (Evans & Etienne, 2010)

The Palestinian MOH provides various essential services including health protection, promotion, prevention, treatment and care. Indicators of Health Coverage are the best to reflect progress in providing services in UHC (WHO, 2020d). One indicator is not enough to measure progress on UHC; for this reason, the Service Coverage Index (SCI) is calculated by the geometric mean of 14 indicators. Tracer indicators of the health coverage are on a scale of 0 to 100(WHO, 2020b).

Progress toward achieving universal coverage of essential health care services can be slow. People covered by essential health services in 2017 were estimated to be about one third of the global population (UNSTAT 2020). Moreover, the COVID-19 crisis suspended all UHC efforts in order to dedicate all health resources to COVID-19 patients and to reducing the burden on health workers (United Nations, 2016). As such, it is clear that UHC needs more efforts to be universally achieved.

The 14 indicators of UHC service coverage are organized into 4 categories, as the following (WHO, 2020b):

Category I: Reproductive, maternal, newborn and child health (RMNCH):

Family planning: Percentage of women of reproductive age (15−49 years) who are married and have their need for family planning satisfied with modern methods.

Pregnancy and childbirth care: Percentage of women aged 15-49 years with a live birth in a given time period who received antenatal care four or more times.

Child immunization: Percentage of infants receiving three doses of diphtheria-tetanus-pertussis vaccine.

Child treatment: Percentage of children under 5 years of age with suspected pneumonia in the two weeks preceding the survey (cough and difficult breathing NOT due to a problem in the chest and a blocked nose) taken to an appropriate health facility or provider.

Category II: Infectious diseases

Tuberculosis: Percentage of incident TB cases that is detected and successfully treated.

HIV/AIDS: Percentage of people living with HIV currently receiving antiretroviral therapy.

Malaria: Percentage of population in malaria-endemic areas who slept under an insecticide-treated net the previous night [only for countries with high malaria burden].

Water and sanitation: Percentage of households using at least basic sanitation facilities.

Category III: Non-communicable diseases

Hypertension: Age-standardized prevalence of non-raised blood pressure (systolic blood pressure <140 mm Hg or diastolic blood pressure <90 mm Hg) among adults aged 18 years and older.

Diabetes: Age-standardized mean fasting plasma glucose (mmol/L) for adults aged 18 years and older.

Tobacco: Age-standardized prevalence of adults ≥15 years not smoking tobacco in last 30 days.

Category IV: Service capacity and access

Hospital access: Hospital beds per capita, relative to a maximum threshold of 18 per 10,000 persons.

Health workforce: Health professionals (physicians, psychiatrists and surgeons) per capita, relative to maximum thresholds for each cadre.

Health security: International Health Regulations (IHR) core capacity index.

The calculation of the index uses geometric means of the four categories as shown below

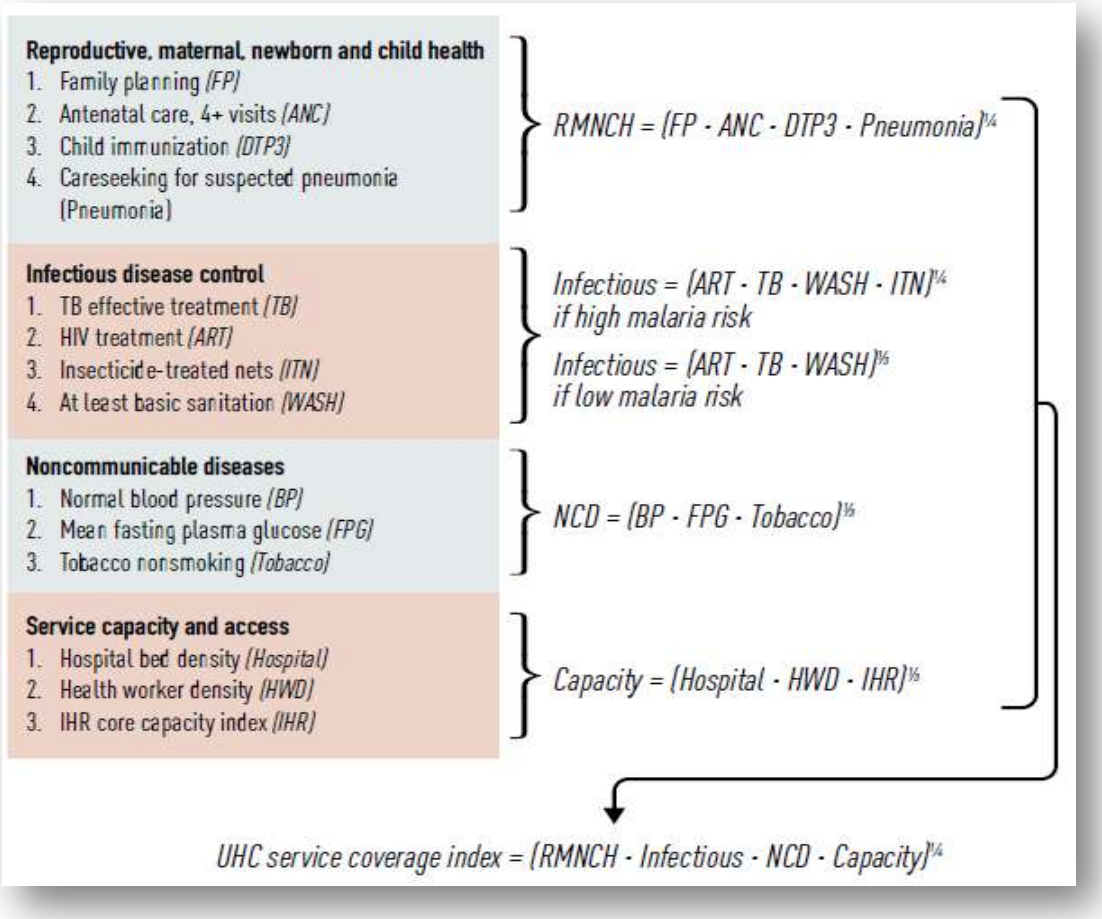

Figure 3: UHC SCI calculation (World Health Organization (WHO), 2019)

This study focuses on RMNCH categories; RMNCH categories have substantial importance in the UHC 2030 agenda. Indicators within this category are included in many targets in *SDG 3: Ensure healthy lives and promote wellbeing for all at all ages* (WHO, 2020a), which further highlights the importance of RMNCH. Investigating RMNCH service coverage requires an understanding of national progress in coverage of RMNCH essential services (Amouzou et al., 2020); this will be illustrated in the following sections.

2.3 Family Planning

The "Family Planning and the 2030 Agenda for Sustainable Development" booklet produced by the United Nations mentions that from the 1.9 billion women of reproductive age (15-49 years) worldwide in 2019, 1.1 billion need family planning; among them, 842 million are using modern contraceptive methods, and 270 million are considered to have an unmet need for contraception (Photo & Park, 2011).

The WHO explains that family planning helps people to anticipate their desired number of children and the period of time between births through use of contraceptive methods (WHO, 2013). The WHO asserts that family planning has a direct impact on women's health and well-being, in addition to positive impacts on pregnancy outcomes (WHO, 2013). The use of contraception methods reduces infant mortality, prevents pregnancy-related health risks and empowers women and enhances their education (El Khoury & Salameh, 2019).

Family planning helps to achieve women's empowerment, gender equality and health. References to family planning indicators are included in Goal 3: Ensure healthy lives and

promote wellbeing for all at all ages, and in Goal 5: Achieve gender equality and empower all women and girls (United Nations, 2020; WHO, 2010).

The use of contraception in the West Bank of Palestine was reported by 60 percent of currently married women in the Multiple Indicator Cluster Survey (MICS) of 2014. The most popular method reported was by Intrauterine Device (IUD), which was used by 31 percent of married women in the West Bank. Results showed that there was an unmet need for contraception among 11 percent of women age 15-49 years. In addition, the MICS 2014 results highlighted that 44.1% of married women who use modern family planning methods were satisfied (PCBS, 2014).

2.4 Pregnancy and Childbirth Care

The pregnancy and childbirth care indicator is defined as: Percentage of women aged 15-49 years with a live birth in a given time period (for this study 2019) who received four or more antenatal care visits (World Health Organisation, 2011).

In 2014, 95.5% of Palestinian women received antenatal care at least four times, which shows increasing awareness about the importance of care during the pregnancy (PCSB, 2014). In 2018, the percentage of pregnant women in the West Bank who received ANC in the Palestinian MOH PHC was 46.5%, with an average of 4.5 visits per woman. ANC is also provided by private clinics, NGOs and UNRWA (Thresholds, 2003; Venkateswaran et al., 2018).

2.5 Child Immunization

In 2019, about 85% of infants (children younger than one year of age (World Health Organization, 2013)) worldwide received three doses of diphtheria-tetanus-pertussis (DTP3) vaccine, protecting them against infectious diseases which may cause illness, disability and sometimes fatality. By 2019, 125 UN Member States had reached at least 90% coverage of DTP3 vaccine (WHO, 2018).

Child vaccination is one of the most efficient and cost-effective health interventions that decreases child deaths. The WHO and the United Nations Children's Fund (UNICEF) review immunization coverage data annually for the following vaccinations: diphtheria–tetanus–pertussis, bacilli Chalmette -Guerin, hepatitis B, polio, Homophiles influenza type b, and measles (Burton et al., 2009; Ozawa et al., 2012, 2017).

Child immunization programs in countries can be reflected by the coverage of Diphtheria-Tetanus-Pertussis (DTP3), since DTP3 includes other vaccines, such as those for hepatitis B and homophiles influenza type b (World Health Organisation, 2011) and is a administered on a multi-dose schedule included in the Expanded Program on Immunization (EPI). DPT coverage is widely-used as a robust measure of the performance of vaccine childbirth systems in countries (Mosser et al., 2019).

Regarding DTP3 in Palestine, the percentage of children one year old who had received DTP3 was 96.9% in 2014 (PCBS, 2014). This shows that the immunization program in Palestine is robust and that family awareness about the benefits of child vaccination is high.

Immunization coverage is used to monitor immunization services locally, nationally and internationally to determine needed enhancement in immunization resources (Unicef, 2005), to enhance strategies for control of vaccine-preventable diseases and to assess adding new vaccines into immunization systems nationally and locally (World Health Organization, 2014).

2.6 Data Quality

Monitoring mechanisms and accurate measurements are crucially needed to achieve UHC and other health-related SDGs (World Health Organization, 2015). Globally, much attention is given to mechanisms for better quality of reporting of the SDG indicators, including the development of action plans which aim to improve health systems at the national level. That data and reporting mechanisms should be developed at the national level in line with health policies and the local context. Reporting mechanisms should rely on national routine data information sources such as census, civil registration and HMIS data, not on estimated global reports. National data systems should be comparable based on validity, timeliness and reliability (Aung et al., 2019).

In the last decades, the international health community has emphasized the importance of increasing the availability, use and quality of data for health policies in low and middle-income countries (LMICs) (Aung et al., 2019). PHC officials in LMICs often evaluate the quality of their national health data as poor or modest quality (Frøen et al., 2016). Insufficient systems in LMICs affect the health data for collection, analysis and reporting, which severely affects the efficiency of decision-making and health outputs (Aung et al., 2019). The availability of comprehensive interventions and accurate measured indicators of RMNCH is

considered the cornerstone of monitoring and achieving UHC (Requejo et al., 2013). In addition, the availability of data enhances policy implementation, national planning and monitoring of equity and health outcomes. National e-registries should manage collecting health data in an accurate way and in real-time (Johnson et al., 2017).
Consistency and reliability issues are generally related to the nature of variables that describe the data, poor reporting and missing data (Altman et al., 2018).

Many WHO household and facility surveys for monitoring health are designed and constructed to reliably capture health indicators (Bryce et al., 2013). To measure coverage of RMNCH interventions, many efforts are needed to validate surveys that measure these interventions. These efforts must be continuous, systematic and periodically asses the reliability of coverage of RMNCH measurements. The reformed MICS and Demographic and Health Surveys (DHS) will provide better data to capture health status (Munos et al., 2017). All the efforts toward increasing the reliability and decreasing inconsistency of data are beneficial. Inconsistencies can enormously affect the reliability of data (Feder, 2018).

High data quality in the health sector is the cornerstone of better health outcomes and achievement of UHC. Quality data also reflects a transparent situation about health status nationally and can facilitate achieving UHC (Frøen et al., 2016; Temmerman et al., 2015). Understanding how Domain Concepts impact data quality of a task is used to prioritize improvement efforts in data quality (Johnson et al., 2017).

Based on Medical Informatics in Research and Care in University Medicine (MIRACUM) in Germaniy, Kapsner (2019) summarized the most important data quality indicators in the

health sector as missing values for data elements, data elements with unknown values, invalid values for qualitative data elements, invalid values for quantitative data elements and consistency. Kapsner highlighted the importance of unifying, standardizing and harmonizing assessment of data quality in electronic health records (HER) (Kapsner et al., 2019).

Electronic systems have improved data quality recently. Many innovative techniques have been used for more accurate and valid data to improve data quality. Functionalities have been used such as limitations for data entries and logical checks of values, warning prompts for wrong or missing data entries or predefined algorithms to improve correct categorizations of health data (Chi et al., 2011).

One of the most comprehensive tools that have been created for data quality review (DQR) purposes is the WHO–DQR toolkit. This tool examines data completeness, accuracy and consistency of programs; it also examines the overall adequacy of health data in facilities to support higher level decision making and monitoring. The WHO recommends using the data quality desk review annually. A DQR examines data quality at the national level (WHO, 2017b).

This toolkit was created by comprehensive collaboration between the WHO, the Global Fund to Fight AIDS, Tuberculosis and Malaria, Gavi - the Vaccine Alliance, and United States Agency for International Development (USAID)/MEASURE Evaluation. It is meant to unify the data quality approach. It was built and integrated upon current and previous tools to assess data quality at facility level, taking into consideration best practices (WHO, 2017b). The data quality desk review examines a core set of tracer indicators from program areas related to

these dimensions. The desk review requires monthly or quarterly data by administrative area for the most recent year and annual aggregated data of the last three reporting years for these indicators.

It uses an automated MS Excel to do analysis; within MS-Excel it uses Visual Basic Application (VBA) so macro must be enabled. The desk review can also be used in the District Health Information System, version 2 (DHIS2), the PHC HMIS platform developed by the University of Oslo and adopted in the Palestinian MOH, by application of "DQR" on the local instance of DHIS2 (WHO, 2017b).

According to the head of the Health System Department in WHO/EMRO, this tool addresses governments. Therefore, it is very rare for MOH reports on data quality assessments to be published online.

In the Palestinian context, The RMNCH indicators (family planning, pregnancy & childbirth care and child immunization) are captured from two sources by definition: household surveys and facility information systems (WHO, 2020b). For child immunization, the only resource of data is facility information system data captured in the Palestinian MOH Preventive Medicine Department. The data has high availability since it is captured only in one department; the providers of vaccinations in Palestine are the Palestinian MOH PHCs, UNRWA and private hospitals. The vaccinations given by other nongovernmental service providers are also captured in the Palestinian MOH system, as the MOH is the only official provider in Palestine. High-quality and reliable reports are available about the Palestinian

MOH vaccination programs, and data is captured using the immunization program in the Preventive Medicine Department in the Palestinian MOH.

For the other indicators (family planning and pregnancy and childbirth care), data captured in health facilities are not sufficient. For example, in 2019, only 46% of pregnant women registered in the Palestinian MOH PHC clinics for ANC and the MOH PHC clinics provide family planning services to about 40% of all beneficiaries of family planning service in Palestine (Thresholds, 2003). Data from other providers such as UNRWA is captured and recorded, but there is a significant number of women who use private clinics. These data is needed to be captured for better representation of the Palestinian service status.

2.7 Operational Framework

The operational framework of the study is consisted of two section; data quality review of MOH data in the RMNCH category indicators: family planning tracer indicator, pregnancy & delivery care tracer indicator and child immunization tracer indicator. In addition, calculating these three tracer indicators from the available sources at national level. These sources include UNRWA, HWC, PFPPA and definitely MOH data as the following figure.

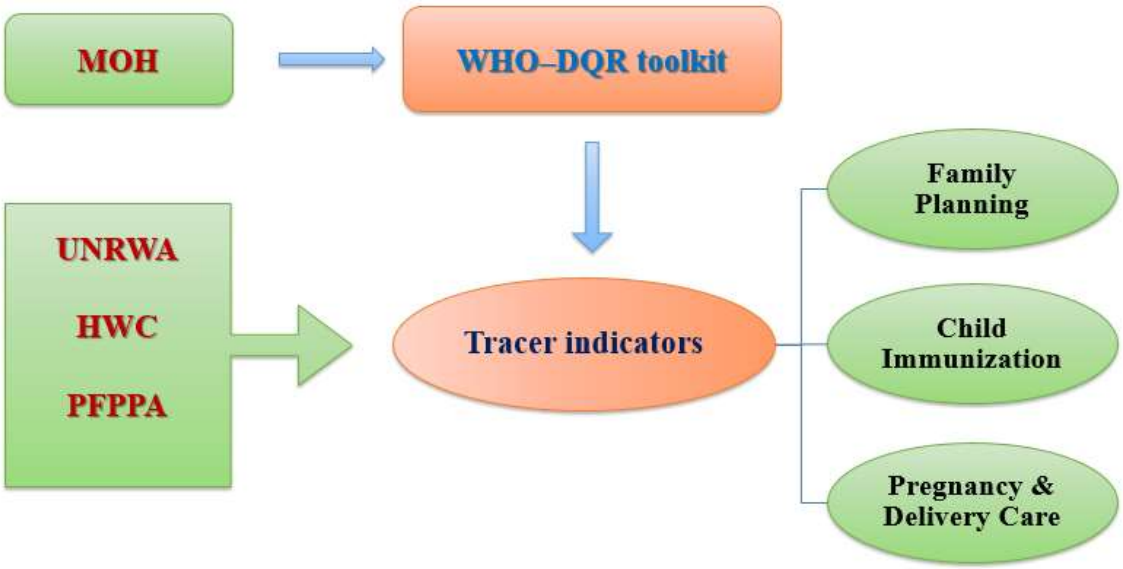

Figure 4: Operational Framework

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter illustrates the methodology used in this study; it discusses study setting & population characteristics, study design, study sample, data collection & materials, study tools, data analysis in the study and ethical considerations taken.

3.2 Study Population & Sampling

This study has considered all reported data via the MOH electronic systems for targeting the three tracer indicators of the UHC index in the following population groups: (1) Modern family planning services for women in the MOH PHC clinics' e-registry data base, (2) Pregnant Women ANC visits in the MOH MCH e-registry data base, and (3) Vaccinated children with DPT3 in the MOH preventive medicine e-registry data base. The following points presenting the study population:

1. According to the reported national data, in 2019, the total number of family planning center visits for family planning services in the West Bank was 84,280 visits. There were 26,445 first-time registered visits by new beneficiaries of family planning services in Palestine (Thresholds, 2003). 30% of the PHC centers in the Palestinian MOH provide family planning services by a professional team (Khader & Hamad, 2018).

2. In 2019, 36,048 pregnant women were registered in the MOH PHC centers as new visits, which is equal to 46% of all pregnant women in the West Bank; 4.2 visits was the average number of visits to these centers during pregnancy (Thresholds, 2003). The total number of gynecologists in Palestine is 450, whereby 380 of them work in the private sector.

3. In 2019, 80,553 children were vaccinated with DPT3 (PENTA III) vaccination with a coverage of 99.7% of all Palestinian children (Thresholds, 2003).

The population of the study for ANC visits is 336 MOH PHC clinics that have MCH e-Registry out of 404 MOH PHC clinics that provide MCH services with coverage of 83.17%. In family planning, the population is the data captured from 281 MOH PHC clinics that provide family planning services. For DPT3, the population of the study is all national immunization clinics that capture all DPT3 data in all governmental and non-governmental centers that provide DPT3 with a coverage of 100% at national level since the Palestinian MOH is the only authorized organization regarding immunization.

There is no sampling in the study; all available captured data were collected for the analysis. All the data in the above-mentioned clinics were collected for the study.

3.3 Study Design

This study is a retrospective data review of the available electronic data sets that captured family planning, ANC4 visits and DPT3 immunization in 2019. Electronic data from the community health department in the Palestinian MOH for the family planning tracer indicator was reviewed. Electronic data from the MCH e-Registry in the Palestinian MOH was used for the pregnancy and childbirth care tracer indicator. Moreover, electronic data from the preventive medicine department in the Palestinian MOH was used for the child immunization tracer indicator.

3.4 Data Collection

Data were collected for the three tracer indicators in the three population groups as the following:

3.4.1. Family Planning Indicator

Data was retrieved from the electronic data base at the community health department in the Palestinian MOH for all PHC clinics. The data of the modern family planning beneficiaries in Palestine was collected in an Excel form in a monthly aggregated data format for each of the 11 districts in the West Bank. Moreover, the data for family planning recurring visits indicator was collected to determine the consistency dimension in the Data Quality Review (DQR).

Prior to using the data for analysis, a set of procedures were used to process and clean the data in order to be compatible for entry and analysis by the research tool.

The tool uses an aggregated form of the desired indicators in a monthly form for each district and aggregated data for the three years prior to the data quality review. For family planning, data were divided differently into each method alone. The researcher aggregated all methods of the same district in a monthly form and in a yearly form for the previous three years. Excel functions were used to aggregate the collected data and transform it into a format compatible to the DQR tool. Moreover, the indicator in the family planning program that is needed for the consistency dimension in the DQR tool included the beneficiaries of the family planning methods within the number of recurring visits, which is how it is captured in the community

health department in the Palestinian MOH. Therefore, the number of beneficiaries was subtracted from the number of recurring visits and then it was entered in the DQR tool.

3.4.2 Pregnancy and Childbirth Care Indicator for ANC 4th

For the ANC 4th visit tracer indicator and its related indicator, ANC 1st visit, the data were collected from the MCH e-Registry in the PNIPH data base of the MOH in an Excel format according to the DQR analysis tool; that is aggregated monthly data for the last three preceding years for each district of the West Bank. Data were then copied and pasted into the DQR tool.

3.4.3 Child Immunization Indicator for DPT3

For the DPT3 and its related indicator for consistency -DPT1- the data were collected from the Preventive Medicine Department in the Palestinian MOH in a paper printed hard copy format. It was classified for each district in a monthly aggregated form and for the three preceding years. The researcher filled in these data manually into the DQR tool in the different Excel cells needed for the analysis.

3.4.4 Tracer Indicator Collection

In pursuing DQR in the Palestinian MOH, the study also calculated the three tracer indicators of the RMNCH category to calculate the UHC-SCI from the available electronic data at the national level using the WHO UHC-SCI tracer indicator equations (WHO, 2020b). For the modern family planning methods tracer indicator, the aggregated data was collected from family planning service providers, which are the Palestinian MOH PHC clinics, UNRWA clinics, the Palestinian Family Planning and Protection Association (PFPPA) centres and the

Health Work Committee (HWC) centres and the WHO equations for tracer indicators were used (WHO, 2020b).

For Antenatal care 4th visit tracer indicator, the data was collected from the documented service providers which are UNRWA clinics and MOH clinics using the MCH e-Registry and the WHO equations for tracer indicators were used (WHO, 2020b).

For the 3rd dose of DPT tracer indicator, the data was collected from the Preventive Medicine Department in the Palestinian MOH. They are the only authorized authority for all immunization programs by the WHO and the WHO equations for tracer indicators were used (WHO, 2020b).

Tracer indicator available data for family planning, pregnancy & childbirth care and child immunization were collected from service providers in Palestine either from the Palestinian MOH or non-MOH organizations, and the aggregated number of the numerator and denominator were gathered using multiple methods; some data were acquired by phone call, other data with a formal e-mail and some organizations needed a site visit with a formal approval of the MOH to collect the data. (See Appendix section for the official approval letter).

3.5 Data Analysis Tool

Data was filled in the WHO DQR – desk review tool as described above for analysis. The tool examines data quality in four dimensions; completeness, internal consistency, external comparisons and external consistency with population data.

Data Analysis Domains

The DQR desk review evaluates standard metrics within four data quality domains; each domain is calculated to evaluate data quality in different ways. Every domain has a dashboard for results, a summary dashboard and text areas for interpretations (WHO, 2017b).

3.5.1 Domain 1 - Completeness and Timeliness of Reporting

Data completeness is needed to determine if the health program is effective, and if it is achieving the needed goals. Completeness of data examines whether all facilities are reporting.

This dimension - completeness of reporting – consists of the health-facility level (the first administrative unit), completeness of reporting at a higher level (district, region and national), and the completeness of data elements (examines for missing data) on tracer indicators across the selected program areas (WHO, 2017b).

Completeness of reporting in administrative units (district, regional or provincial reporting) is defined with the following equation: (WHO, 2017b)

$$\text{Completeness of reporting} = \frac{\text{The number of administrative unit monthly reports received}}{\text{The total number of reports expected for a specified time period (usually one year)}} \times 100\%$$

A completeness of reporting rate of 100% indicates that all administrative units reported.

Timeliness of reporting has also been evaluated. Timeliness is defined with the following equation:

$$\text{Timeliness of reporting} = \frac{\text{The number of reports from administrative units submitted to the higher level by the reporting deadline}}{\text{The number of reports actually received}} \times 100\%$$

Completeness of data is measured also by calculating the proportion of non-zero values for particular indicators, by using the proportion of empty cells that should be recorded and the proportion of cells with zero values (WHO, 2017b).

3.5.2 Domain 2 - Internal Consistency of Reported Data

This dimension investigates the consistency of reported data for selected indicators based on the previous reported data. Trends and patterns in reported data were investigated over time, which was done in two steps; one is done within the year of the assessment for each moth, and the second is done by comparing the data from the previous 3 years to search for outliers that may indicate a data issue.

In this dimension, a program indicator is also compared with another related indicator in the same program. This link should be reflected in the reported data; as such, these related indicators were chosen through consulting an expert in each tracer indicator field: two from the Palestinian MOH (the head of the Community Health Department and the head of the Preventive Medicine Department); for the family planning and child immunization tracer

indicators as well as one from the PNIPH (a program officer in the MCH e-Registry program).

The DQR can also indicate if there are outliers in the national data. An outlier is defined as a value that is out of a particular pattern in a series of data, which is extreme in relation to other data. Outliers happen because of changes in program activities (e.g. intensive campaign in a district) or because of a data quality issue. Two types of outliers are defined below: moderate outliers and extreme outliers. Usually moderate outliers have occurred as a result of campaigns and extreme outliers because of data issues or opening a new facility. Outliers affect data interpretation; knowing the pattern of service aids in interpreting the reasons for outliers (WHO, 2017b).

Data Quality Metric: Outliers in the Current Year

Two methods are used to investigate outliers in any data set, as the following:

Multiples of the standard deviation of the mean: Values in a data set greater than multiples of the standard deviation (SD) of the data set means (i.e. ± 2SD, ± 3SD, etc.)

Moderate outliers are the outliers greater than 2 SDs from the mean, while extreme outliers are the outliers greater than 3 SDs from the mean.

Modified Z-score: The Z-score of a data set is the number of SDs from the mean.

Outliers are identified from the reported monthly data of facilities at the national level for the year of the DQR assessment using one of the above-mentioned methods.

Moderate outliers: At the second administrative level (such as district or region), the desk review calculates the percentage of data reported from facilities in which the monthly values of a selected indicator are moderate (± 2–3 SDs from the monthly data mean, or a value of > 3.5 using the modified Z-score). This percentage is calculated as the following:

$$\text{Percentage of outliers} = \frac{\text{\# of moderate outliers in facility for a selected indicator in the year of assessment}}{\text{The total number of expected values in facility for a selected indicator in the year of assessment}} \times 100\%$$

Extreme outliers: The same as moderate outliers, it is the percentage of the reported monthly data that are ±3 SDs from the monthly data mean. The percentage is calculated by dividing the number of extreme outliers in the facility by the total number of expected reported data entries (WHO, 2017b).

Data Quality Metric: Consistency over Time within the Same Indicator

Consistency over time (%) is the ratio of reported data for the year of analysis to the mean of reported data of the three preceding years. In other words, it is a comparison of the year of the assessment reported data with the expected trend from the three preceding years, whether a growth or decline. Consistency over time compares reported data for an indicator with the trend of the three preceding years as a dimension of data quality review (WHO, 2017b).

Data Quality Metric: Consistency Between Related Indicators

This data quality metric checks the predictable patterns between two related indicators in the same program to examine if they both follow the pattern between them. Consistency between

two indicators is defined as the ratio between them. Sometimes the ratio will be 1 or less; in some cases, it is higher than 1. Districts with a percentage difference higher than the specified threshold (by default 10%) are flagged for further investigation (WHO, 2017b).

3.5.3 Domain 3 - External Consistency of Reported Data

In this dimension, reported routine data from facilities in HMISs of health tracer indicators are compared with population-based surveys. Surveys are not adequate alone to monitor the health sector due to that fact that the high cost of such surveys ensures that they will not be conducted yearly. Additionally, there are some challenges in interpretation of the survey output in smaller geographical areas.

External consistency of reported data is defined as the ratio of the reported data from routine HMISs to the estimated data from household surveys (WHO, 2017b). In Palestine we use MICS surveys.

3.5.4 Domain 4 - External Consistency of Population Data

The desk review tool uses population data to compare indicators with population data across geographical areas, over time, and of subgroups within population.

Population data for a subgroup (i.e. number of infants, pregnant women) is defined as the denominator in the calculation of proportion, while the numerator is defined as the events or indicator itself, i.e. the number of ANC visits, DPT3 etc.

Using population data in indicator calculation enhances the effective monitoring and evaluation of tracer indicators in health programs. To achieve this dimension, the

denominator source must be collected from two sources: the United Nation population projections and the recent local census data to compare between them (WHO, 2017b).

$$\text{Consistency with UN} = \frac{\text{Official country estimation of \# of pregnant women or live births}}{\text{The official UN projection for the year of assessment and for the same population}} \times 100\%$$

In the DQR desk review Excel sheet, an outline of the calculation based on the level of reporting at the national level, time of reporting of the month, year of conducting the assessment and administrative levels were needed to conduct the assessment.

Then, the administrative units were defined in the organization in which the assessment were conducted (the Palestinian MOH) and mapped with the administrative level in the last population survey (MICS 2019 conducted by the PCBS) for assessing the dimension of data and comparing with population data.

Tracer indicators of each program area were defined based on the need of the assessments; each tracer indicator needs another indicator in the same program to assess the consistency dimension of DQR. The tracer indicators related to the three indicators of RMNCH were selected by consulting with each related department expert in the Palestinian MOH as the following: (1) For the family planning indicator, the other indicator selected was the modern family planning visits indicator; (2) For the ANC 4th visit indicator, the other related selected indicator was the ANC 1st visit indicator; (3) For the DPT3 tracer indicator, the other related selected indicator was DPT1.

For threshold definition of acceptable error of values, the Palestinian MOH does not use the WHO desk review tool. Because of that, the researcher used the default thresholds of the

DQR dimensions, which are recommended by the WHO for use in such cases (WHO, 2017b). These thresholds are as shown in Table (1).

Table 1: Predefined thresholds of the WHO DQR toolkit

Data Investigated	Threshold
Timeliness and completeness of data from facilities and aggregation at district levels	The default threshold: 75%
Indicator completeness reporting: % of non-zero values; % of non-missing values of DPT3	The default threshold: 67%
Indicator completeness reporting: % of non-zero values; % of non-missing values of ANC 4th	The default threshold: 90%
Indicator completeness reporting: % of non-zero values; % of non-missing values of modern family planning method	After consulting with community health department in the Palestinian MOH, the threshold was set at: 90%
Consistency of districts and facility reporting	The default threshold: 10%
Number of allowed extreme outliers in the year of assessment they will be flagged for investigation ≥	The default threshold: 1
Number of allowed moderate outliers in the year of assessment that will be flagged for investigation ≥	The default threshold: 2
Consistency over time for the three indicators	The default threshold: 33%
Consistency between related indicators for the three indicators	The default threshold: 10%
Comparison of routine data with population-based survey values of the year of the assessment of the three indicators	The default threshold: 33%
Consistency of denominator between routine data and official population statistics of the three indicators	The default threshold: 10%

The next step was to fill in the completeness of reporting data; these data were collected from PHC departments in the Palestinian MOH, which was also compared with the data in the PCBS for validation; the number of facilities registered is the same in both sources of data. The number of facilities was collected within the Palestinian MOH from two sources as well: from the DHIS2 which is the HMIS that is used for most PHC services, and from the Palestinian Health Information Center (PHIC) in the Palestinian MOH. Then, the aggregated data of the three tracer indicators for the preceding three years was filled in to investigate consistency over time.

For consistency with population data, the tool uses available data for the denominator of the population to compare with the program denominator. The data that was filled in is: live births, total population and children < 1 year of age.

Then, for the three tracer indicators and the other three related indicators, two indicators (the main indicator of the study and another related indicator for comparing) from each program of the RMNCH category were aggregated and entered in the year of the assessment for each district in a monthly form. The data uses the SD of the means of data entered to investigate the outliers (moderate and extreme) and flag them for further interpretation. This step was repeated for each indicator of the three indicators.

3.5.5 Tracer Indicators Equations:

The following WHO tracer indicator equations were used in calculating the available electronic data of: family planning, pregnancy & childbirth care and child immunization tracer indicators in the West Bank (WHO, 2020b):

$$\text{Family planning} = \frac{\text{Number of women aged 15-49 who are married and use modern methods of family planning}}{\text{Total number of women aged 15-49 who are married and in need of family planning}}$$

$$\text{Pregnancy \& childbirth care} = \frac{\text{Number of women aged 15−49 years with a live birth in a given time period who received antenatal care four or more times}}{\text{Total number of women aged 15−49 years with a live birth in the same period}}$$

$$\text{Child immunization} = \frac{\text{Children 1 year of age who have received three doses of diphtheria-tetanus pertussis containing vaccine}}{\text{All children 1 year of age}}$$

3.6 Ethical Consideration

- Personal information was not addressed in data collection as aggregated data was used from multiple resources.
- Permission was obtained from the general director of Public Health who was responsible for the UHC committee in the Palestinian MOH. (See Appendix section).
- Approval for collaboration between AAUP and the Computer and Engineering Unit in the Palestinian MOH was obtained to conduct this health informatics and services study. (See Appendix)
- The WHO DQR – desk review tool is published by the WHO for free use; there were consultations with the WHO EMRO office about using the DQR desk review tool in the Palestinian MOH.

3.7 Study limitations

- The WHO DQR toolkit usually addresses ministries of health rather than academic researchers, which is the reason for not finding research articles about the tool. Usually governments do not publish such articles.
- The PCBS provided the needed data in percentage format for the third dimension of data quality, which is external consistency of reported data. Therefore, the external consistency with reported data was not assessed.
- There is no data warehousing in Palestine, which made the data collection process difficult and missing some elements.
- No data could be retrieved from the private sector, which provides about 60% of the perinatal services, according to the MCH program supervisor in the Palestinian MOH.
- Data for two indicators exists in the government and the associations that provide the RMNCH services such as WHC, PFPPA and UNRWA. The lack of exchanging data between health providers makes capturing the indicators more difficult.
- The official statistical office (PCBS) does not provide the needed numbers to calculate the external consistency of reported data domain.

3.8 Summary

In this chapter, many research methodologies were presented, such as: study population, DQR design, DQR tools, DQR analysis and ethical considerations. The study findings and results will be reported in the following chapter.

CHAPTER FOUR: RESULTS

4.1 Introduction

This chapter includes the results of the DQR analysis of the Palestinian MOH data indicators in the RMNCH category of the international UHC index; Family planning, Pregnancy and childbirth care and child immunization. Tracer indicators of these three indicators in the RMNCH have also been calculated based on the available electronic data in the MOH in the West Bank.

4.2 Data Analysis Overview

In the Palestinian health sector, there were many sources of data that were needed for this study, some of which were available in the Palestinian MOH data bases; i.e. family planning, pregnancy & childbirth care and child immunization electronic records and data bases. Other data sources were available in other organizations such as UNRWA and local NGOs like PFPPA and HWC, but these data bases were not accessible to the researcher, so they were not included in the data quality analysis, but can be used for calculating the tracer indicators for the UHC index for Palestine.

4.3 Data Quality Review

The data quality review was conducted using a Microsoft Excel-based DQR – desk review tool from the WHO for this purpose. It used the Palestinian MOH electronic data base to check the four dimension of data quality impeded in the analysis tool; namely completeness and timeliness of reporting, internal consistency of reported data, external consistency of

reported data, and external consistency of population data. The study results are presented hereafter.

4.3.1 Domain 1 - Completeness and Timeliness of Reporting

- Completeness of administrative unit reporting was the first component to be analysed by the WHO DQR toolkit. Analysis showed that the completeness of reporting of the facilities was 100% in all districts with no district below the completeness threshold which was predefined by the WHO to be 75%. Table 2 shows the results of completeness of reporting:

Table 2: Completeness rate of data reporting at district level

Indicator 1a2a: National facility reporting completeness rate and districts with poor facility completeness		
		2019
National facility reporting completeness rate:		100.0%
Number and percent of districts with 100% facility reporting completeness:	11	100.0%
Number and percent of districts with facility completeness below 75%:	0	0.0%

- Timeliness of facility reporting was analysed by the DQR. The result of timeliness of reporting of the facilities was 100% in all districts with no district below the predefined threshold was 75%. Table 3 shows the results of timeliness of reporting:

Table 3: Timeliness rate of reporting at district level

Indicator 1a2b: National facility reporting timeliness rate and districts with poor facility reporting timeliness		
		2019
National facility reporting timeliness rate:		100.0%
Number and percent of districts with 100% facility reporting timeliness rate:	11	100.0%
Number and percent of districts with facility timeliness rate below 75%:	0	0.0%

- Completeness of indicator reporting also included an investigation of missing data and zero values based on the three indicators focused on in the study. It showed that the three tracer indicators have 100% completeness of reporting with no missing or zero values from facilities in each indicator. Table 4 shows the results:

Table 4: Completeness of indicator reporting to check zero values and missing data

Indicator 1b: Completeness of Indicator Reporting - Presence of Missing and Zero Values

2019							
			National score	Districts with > user-defined % of zero or missing values			
Program Area and Indicator	**Quality Threshold - % complete**	**Type**	**%**	**No.**	**%**		**District Name**
Immunization - 3rd dose DPT-containing vaccine	>= 67%	Missing	100.0%				-
		Zero	100.0%				-
Maternal_Health - ANC 4th Visit	>= 90%	Missing	100.0%				-
		Zero	100.0%				-
Reproductive_Health - Women use Modern Family Planning methods	>= 67%	Missing	100.0%				-
		Zero	100.0%				-
		Zero	100.0%				-
Total (all indicators combined)		Missing	100.0%				
		Zero	100.0%				

- Completeness and timeliness of reporting in each program also showed that the score was 100% in completeness and timeliness of reporting for each program of the tracer indicators. It also showed that there were no districts with a percentage below the predefined threshold. Table 5 shows the results of this section:

Table 5: Completeness and timeliness of reporting in each program

Indicator 1d: Program-Specific Completeness and Timeliness of Reporting

1d1: Completeness and Timelines of Reporting from Health Facilities to 1st Aggregation Level

Program Area and Indicator	Quality Threshold	Type	National score %	No.	%	Name
Immunization - 3rd dose DPT-containing vaccine	90%	Complete	100.0%	0	0.0%	-
	90%	Timely	100.0%	0	0.0%	-
Maternal_Health - ANC 4th Visit	67%	Complete	100.0%	0	0.0%	-
	67%	Timely	100.0%	0	0.0%	-
Reproductive_Health - Women use Modern Family Planning methods	90%	Complete	100.0%	0	0.0%	-
	90%	Timely	100.0%	0	0.0%	-

Our results revealed that facility and district reporting were both 100% in completeness and timeliness of reporting.

4.3.2 Domain 2 - Internal Consistency of Reported Data

In this section the results related to internal consistency of reported data, using extreme and moderate outliers, consistency over time and consistency between related indicators is reported on:

Extreme and Moderate Outliers

- There were no extreme outliers in the monthly data entered from the 11 districts in the three indicators that are in the three program areas of assessment. No extreme outliers i.e. no data entered were ≥ 3 SD from the mean of monthly data entered from each district.
- We found a very small percentage (3.3%) of moderate outliers (values between 2 and 3 SDs from the mean of the monthly entries), in the three indicators as shown in Table 6. There were no districts having more than two moderate outliers in the West Bank.

Table 6: Moderate outliers based on SD in the three indicators

Indicator 2a2: Moderate Outliers (2-3 SD from the mean)				2019
	National score	Districts with >= 2 moderate outliers relative to the mean in the year of values		
Program Area and Indicator	%	No.	%	Name
Immunization - 3rd dose DPT-containing vaccine	3.0%			-
Maternal_Health - ANC 4th Visit	3.8%			-
Reproductive_Health - Women use Modern Family Planning methods	3.0%			-
Total (all indicators combined)	3.3%			

- A small percentage of moderate outliers (4%) was found based on the modified Z-score that compares reported and entered data to the median of the monthly data in the three indicators as seen in Table 7. The Z-score is a better measure when there is a large variability in the reported monthly data.

Table 7: Moderate outliers based on Z-score in the three indicators

Indicator 2a3: Outliers (Modified Z-Score)				2019
	National score	Districts with >= 2 moderate outliers relative to the mean in the year of values		
Program Area and Indicator	%	No.	%	Name
Immunization - 3rd dose DPT-containing vaccine	3.0%	1	9.1%	Jericho
Maternal_Health - ANC 4th Visit	3.0%	1	9.1%	Ramallah
Reproductive_Health - Women use Modern Family Planning methods	6.1%	2	18.2%	Salfit, Jerusalem
Total (all indicators combined)	4.0%			

- There were acceptable moderate outliers in the pregnancy & childbirth care program and immunization program.
- Using a Z-score revealed a small percentage of moderate outliers in the family planning program. They were determined specifically using the DQR desk review tool in two districts, which are Salfit and Jerusalem.

Consistency over Time

- Consistency of indicator reporting compares the aggregated data of the year of the assessment (2019) with the average data of the three preceding years. It can be used to investigate if the monthly data is complying with the expected forecasted data. This assessment was used to check the data quality in the three indicators. Consistency in DPT3 showed that data complied with the expected forecasted data with no data in districts exceeding the quality threshold. Table 8 shows the consistency over time of child immunization tracer indicator, and Figure 5 shows the forecasting of child immunization compared to the actual data of the year of the assessment. Figure 6 represents the trend of the data with the three preceding years.

Table 8: Consistency over time of DPT3

Indicator 2b: Consistency of Indicator Reporting Over Time

2b1: Consistency of 'Immunization - 3rd dose DPT-containing vaccine' over time	
Year	2019
Expected trend	Increasing
Compare districts to:	National result
Quality threshold	33%
National score (%)	100%
Number of districts with divergent scores	0
Percent of districts with divergent scores	0%
Names of districts with divergent scores:	Zero

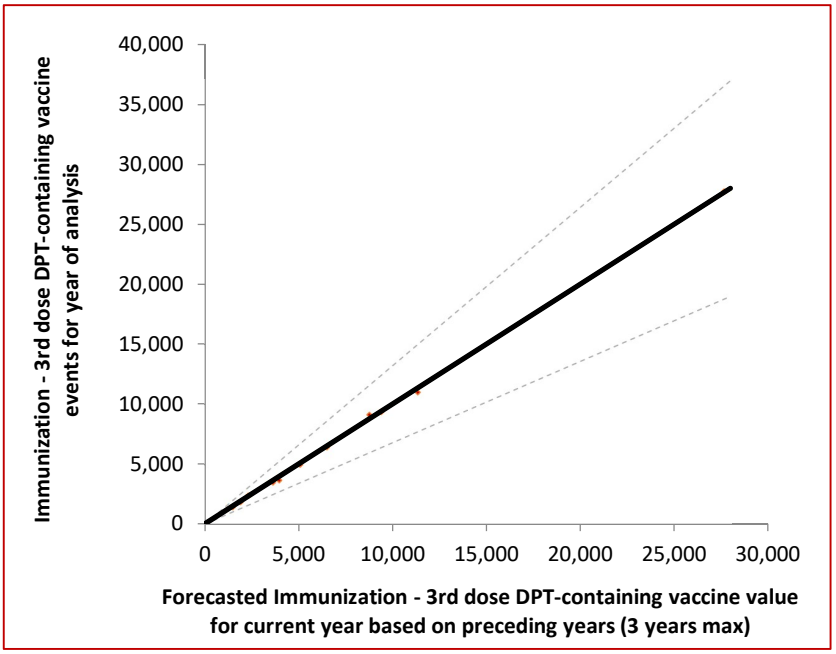

Figure 5: Comparing the forecasted data with the years of assessment data of DPT3

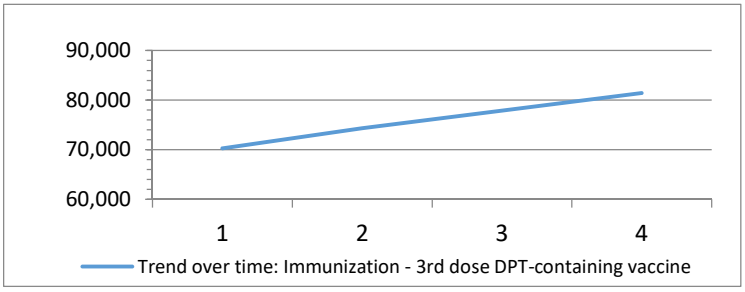

Figure 6: The trend of DPT3 with the three preceding years

- Regarding the pregnancy and childbirth care tracer indicator, is was expected to increase over time because of an increase in the awareness of the community due to the MCH program campaign. The tool shows that this indicator has a high percentage of divergent values in six districts. Table 9 shows the consistency over time of the pregnancy & childbirth care tracer indicator. Figure 7 shows the forecasted data compared to the actual

year of the assessment data, and Figure 8 represents the trend of the pregnancy & childbirth care tracer indicator with the three preceding years.

Table 9: Consistency over time of pregnancy & childbirth care tracer indicator

2b2: Consistency of 'Maternal_Health - ANC 4th Visit' over time	
Year	2019
Expected trend	Increasing
Compare districts to:	expected result
Quality threshold	33%
National score (%)	79%
Number of districts with divergent scores	6
Percent of districts with divergent scores	55%
Names of districts with divergent scores:	
Tubas, Tulkarem, Qalqilia, Jerusalem, Hebron, Jericho	

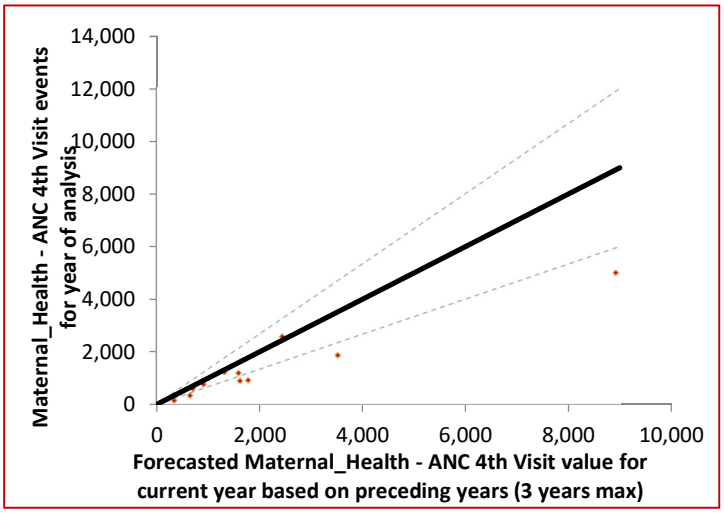

Figure 7: Comparing forecasted data of ANC 4th with the year of the assessment

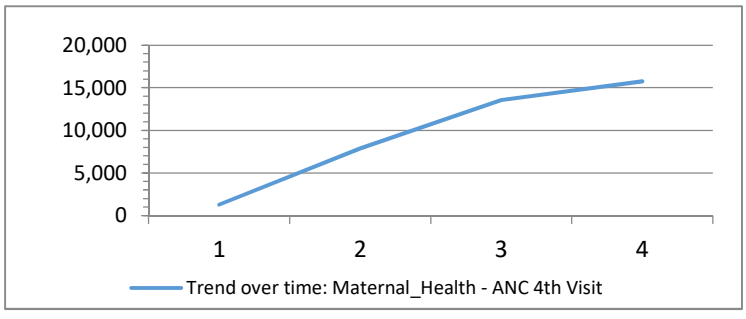

Figure 8: The trend of the three preceding years of ANC 4th

- Consistency of the family planning tracer indicator shows a constant trend, although the trend was expected to increase. The national score for consistency over time was 120% in 2019 with 20% greater value than the mean of the three preceding years. There were two districts with scores divergent from the expected trend (Tubas and Nablus). Table 10 shows the consistency over time of the family planning tracer indicator. Figure 9 shows a comparison of forecasted data to the actual year of the assessment, and Figure 10 represents the trend of the family planning tracer indicator with the three preceding years.

Table 10: Consistency over time of family planning tracer indicator

2b3: Consistency of 'Reproductive_Health - Women use Modern Family Planning methods' over time	
Year	2019
Expected trend	Constant
Compare districts to:	national result
Quality threshold	33%
National score (%)	120%
Number of districts with divergent scores	2
Percent of districts with divergent scores	18.2%
Names of districts with divergent scores:	
	Tubas, Nablus

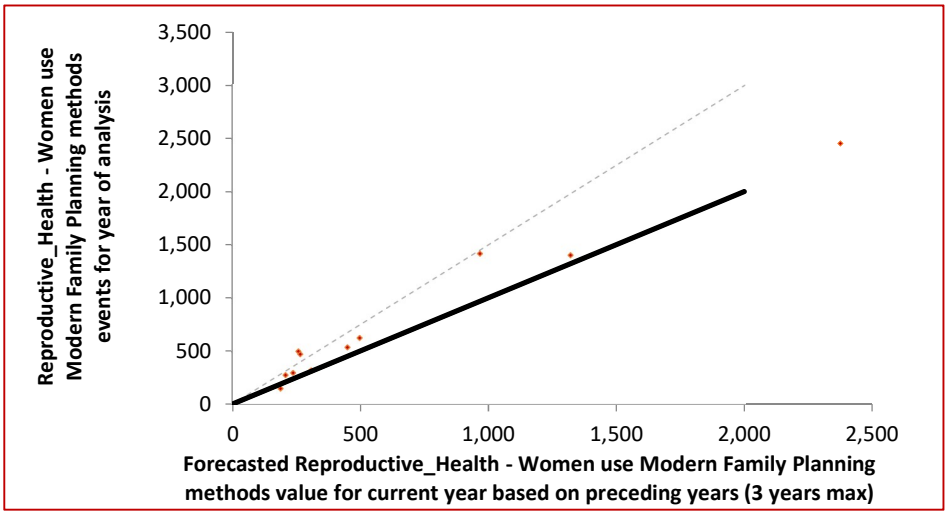

Figure 9: Comparing forecasted data with the year of the assessment

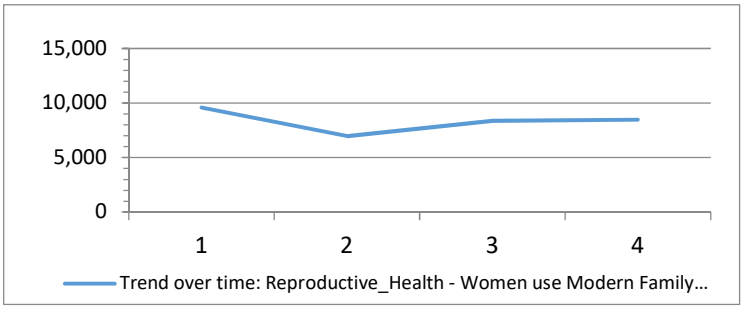

Figure 10: The trend of the three preceding years of family planning

Consistency between Related Indicators

- Consistency between related indicators compares the aggregated annual data of the first indicator to the aggregated annual data of the second indicator. It compares the ratio in the district and compares it with the national ratio of the same indicators.
- In the DPT3 tracer indicator there was an excellent data quality between the two selected indicators (DPT3 and DPT1). There was 100% national score between the two selected indicators with an expected trend between the two indicators equal to each other. Table 11 show the results of consistency between related indicators for child immunization between DPT3 and DPT1. Figure 11 show the relation pattern between DPT3 and DPT1.

Table 11: Consistency between related indicators for DPT

2c1: Immunization Comparison: 3rd dose DPT-containing vaccine : 1st dose DPT-containing vaccine	
Year	2019
Expected relationship	equal
Compare districts with:	national rate
Quality threshold	10%
National score (%)	100%
Number of districts with divergent scores	0
Percent of districts with divergent scores	0.0%
Names of districts with divergent scores:	

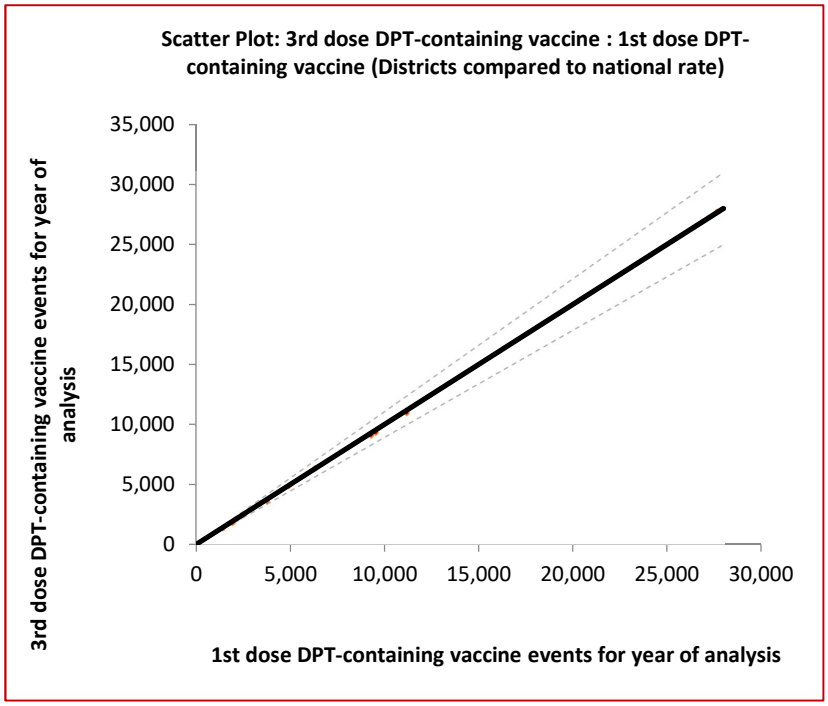

Figure 11: Relation between DPT1 & DPT3

- Consistency between related indicators of the pregnancy & childbirth care tracer indicator shows 56% national score for ANC 4th and ANC 1st. Table 12 show the results of consistency between related indicators for pregnancy and childbirth of care between ANC 4th and ANC 1st . Figure 12 show the relation pattern between ANC 4th and ANC 1st in the WHO RQR toolkit.

Table 12: Consistency between related indicators of pregnancy & childbirth care tracer indicator (ANC4th)

2c2: Maternal_Health Comparison: ANC 4th Visit : ANC 1st Visit	
Year	2019
Expected relationship	equal
Compare districts with:	national rate
Quality threshold	10%
National score (%)	56%
Number of districts with divergent scores	2
Percent of districts with divergent scores	18%
Names of districts with divergent scores:	
	Tubas, Nablus

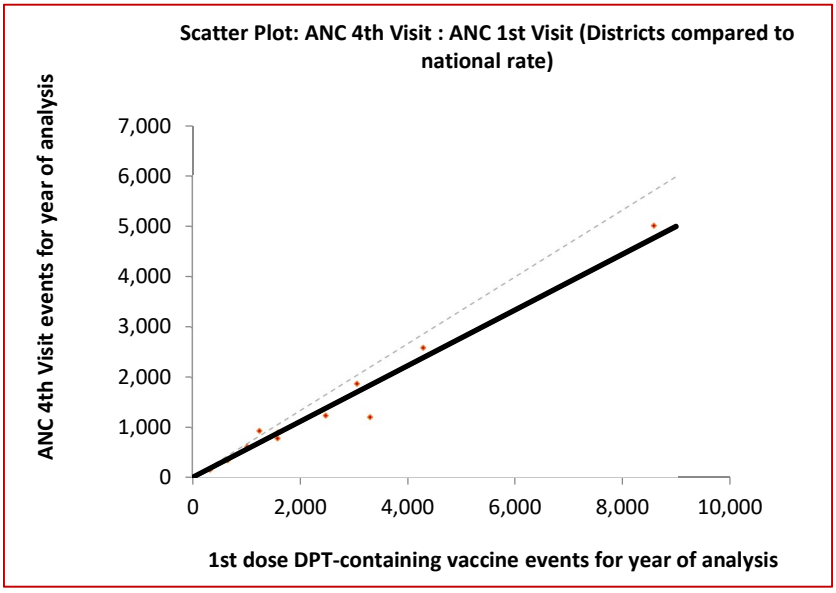

Figure 12: Relation between ANC 4th & ANC 1st

- Consistency of family planning tracer indicator has two districts with divergent scores (Jerusalem and Ramallah). The national score was 47%. Between the two indicators (modern family planning methods and family planning follow up visits) since they were the only available indicators in the family planning program. Table 13 shows the results of consistency between related indicators for family planning indicators. Figure 13 shows the relation pattern between family planning.

Table 13: Consistency between related indicators of family planning tracer indicator

2c3: Reproductive_Health Comparison: Women use Modern Family Planning methods : modern family planning follow up visits	
Year	2019
Expected relationship	Ind 1 < Ind 2
Compare districts with:	national rate
Quality threshold	10%
National score (%)	47%
Number of districts with divergent scores	2
Percent of districts with divergent scores	18%
Names of districts with divergent scores:	
	Ramallah, Jerusalem

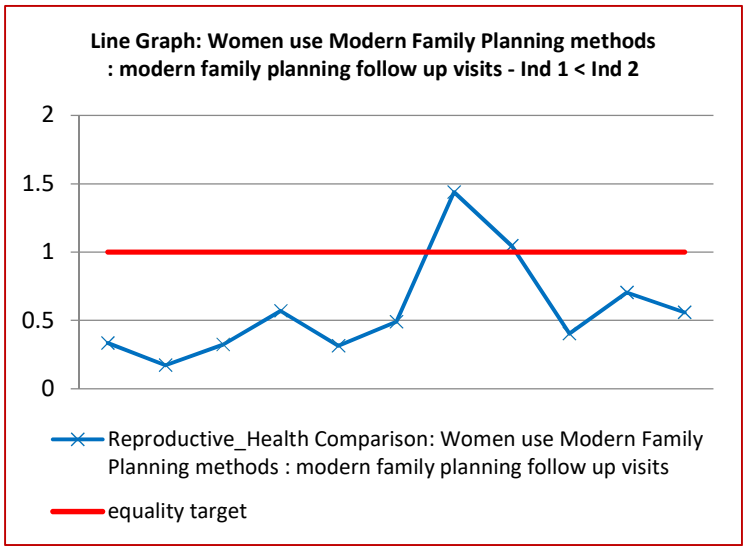

Figure 13: Relation between modern family planning visits & follow up visits

4.3.3 Domain 3 - External Consistency of Reported Data

The third domain of the DQR compares between indicators data from HMISs and population-based surveys. After contacting the PCBS we could not find the needed data to calculate the external consistency. The available data gives only the percentage of each indicator i.e. family planning, ANC4th and DPT3 for each district. However, calculating external consistency needs more data to compare it with the HMISs data. As a result, this domain of the data quality analysis was not possible to conduct in this study.

4.3.4 Domain 4 - External Consistency of Population Data

This domain investigates the population data used for calculation of the health indicators in the above-mentioned domains. It compares the number of live births between the official statistics office (PCBS) in this case and the projection of UN population estimates of live births. It also compares the population data between the official statistics office and program-based data of the same population.

This data includes the following:

- Expected pregnancies
- Live births
- Children < 1 year of age
- Total population

The data included in the tool was compared with UN population projections; the tool gives an option to choose which country is conducting the assessment to compare with UN population projection. UN population projection in the tool is for Palestine, while the data filled in for this research were for the West Bank only. Therefore, the ratio between the official bureau of statistics and the UN projection is 53%. Table 14 shows the level of consistency with UN population projections:

Table 14: Consistency with UN population projection

Indicator 4a: Consistency with UN population projection	
	2019
Ratio of population projection of live births from the Bureau of Statistics to a UN live births projection	53%

Comparing live births between PCBS and HMIS program data in the Palestinian MOH shows a good data ratio of 90%, which shows that most of the data at national level is captured in the Palestinian MOH. Divergent scores were captured in districts that have larger rural populations, Bedouins and larger areas classified as Area C; Over 60 per cent of the West

Bank is considered Area C, where Israel retains near exclusive control (OCHA, n.d.). Table 15 compares live births between HMIS programs and PCBS data.

Table 15: Comparison of live births between HMIS programs and PCBS data

Indicator 4b: Consistency of denominator between program data and official government population statistics

Indicator 4b1 - Comparing the official denominator 'Live births' to an analogous program denominator for the year of analysis

Year	2019
Quality threshold	10%
National score (%)	90%
Number of districts with divergent scores	6
Percent of districts with divergent scores	54.5%
Names of districts with divergent scores:	
Tulkarem, Qalqilia, Salfit, Jerusalem, Bethlehem, Jericho	

Comparing the number of children younger than one-year-old shows that 90% of the national data was captured in the Palestinian MOH HMISs. Similar to live birth data, districts with rural populations, Bedouins and Area C have divergent scores. Moreover, Jerusalem has the highest divergent score. Table 16 shows the external consistency of population data of children younger than one-year-old between HMISs in the Palestinian MOH and the official statistical office (PCBS).

Table 16: Comparison of children < 1 year between HMIS programs and PCBS data

Indicator 4b3 - Comparing the official denominator 'Children < 1 yr' to an analogous program denominator for the year of analysis

Year	2019
Quality threshold	10%
National score (%)	90%
Number of districts with divergent scores	6
Percent of districts with divergent scores	54.5%
Names of districts with divergent scores:	
Tulkarem, Qalqilia, Salfit, Jerusalem, Bethlehem, Jericho	

4.4 Tracer Indicators

Calculating the three tracer indicators as a part of UHC-SCI from the available data is a crucial need for Palestinian healthcare system assessment, planning and understanding the health service delivery system's actual situation. The available electronic data regarding the three indicators was collected to calculate tracer indicators. Figure 14 shows comparison between them.

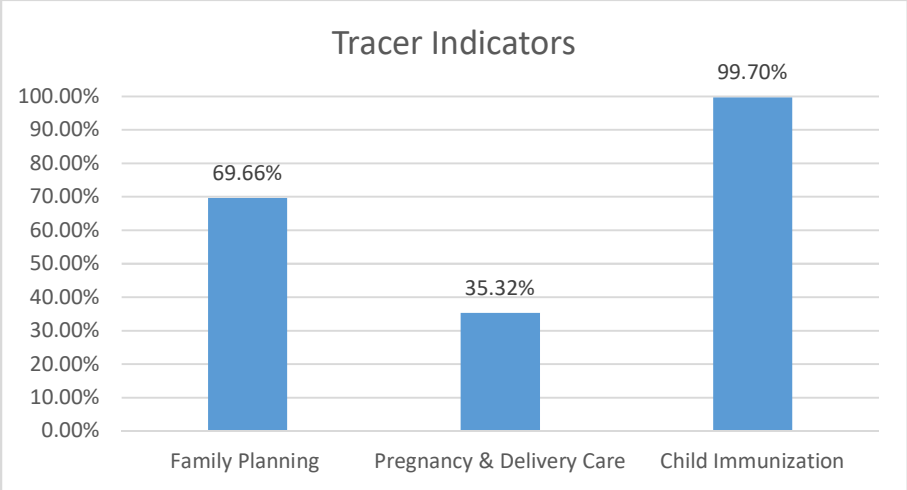

Figure 14: Tracer indicators of the available electronic data in the West Bank

Tracer indicators calculated from the data show that there is almost full coverage of child immunization (DPT3) at 99.7% and the family planning tracer indicator has a coverage rate of 69.66%. However, the pregnancy & childbirth care tracer indicator only had 35.32% coverage.

Table 17 shows RMNCH indicators in the MENA region for comparison; many sources have collected data for RMNCH and were used for this comparison.

Table 17: RMNCH indicators in the Middle East

Indicators / Country	Family planning		Pregnancy & childbirth care		Child immunization	
	%	Year	%	Year	%	Year
West Bank (current study)	**69.7**	**2019**	**35.3**	**2019**	**99.7**	**2019**
Palestine EMRO estimate	59.0	2018	28.0	2018	90	2018
Palestine MICS	42.8	2019	94.3	2019	92.7	2019
Jordan	62.0	2018	95.0	2018	99.0	2018
Egypt	80.0	2018	83.0	2018	93.0	2018
Iraq	59.3	2011	67.9	2018	84.0	2018
Qatar	68.9	2012	85.0	2018	99.0	2018
Tunisia	75.0	2018	85.0	2018	98.0	2018
Turkey	59.7	2013	88.9	2013	98.0	2018

(UNICEF, 2020; WHO-EMRO, 2018; WHO, 2020c)

4.5 Summary

Using the DQR-desk review tool, investigation of three of the dimensions of data quality was conducted; Completeness and timeliness of reporting, Internal Consistency of Reported Data, and External Consistency of Population Data. Moreover, the tracer indicators from the available data were calculated.

CHAPTER FIVE: DISCUSSION

5.1 Introduction

After summarizing the results in the previous chapter, these results will be compared to other results in the literature. Interpretation of the findings has been undertaken to propose possible reasons for why some indicators have small percentages and why the others have high percentages of coverage. The results have also been compared using WHO definition equations with MENA region countries and worldwide.

5.2 Interpretation of Results

A WHO DQR desk review has been undertaken in the Palestinian MOH departments that are responsible for providing services in the three tracer indicator sectors – family planning, pregnancy & childbirth care and child immunization, which gave insights about data quality domains. Moreover, using WHO equations of tracer indicators, West Bank service coverage has been reflected and has also shown that there are still needed enhancements for better coverage of the services regarding the three indicators. In this section, interpretations of the results of the study has been presented to give recommendation to service providers and service delivery stakeholders in the fields of the three tracer indicators focused on in this study.

5.2.1 Domain 1 - Completeness and Timeliness of Reporting

Excellent completeness and timeliness of reporting was found in this study (100%) for facilities at the administrative level and within the programs that deliver the services of the three indicators. Completeness and timeliness is usually high in countries that use HMISs

(DHIS2, 2021), as HMISs allow and facilitate completeness and timeliness of reporting through many sophisticated functionalities that allow users and administrators to access comprehensive reports and dashboards to get the right data in a timely manner. Because the Palestinian MOH adopted electronic HMISs in Palestine, periodic reporting can be done through these systems at the right time. This explains the high percentage of both completeness and timeliness in the Palestinian MOH. When asked about the high percentage in completeness and timeliness of reporting, supervisors at the district level highlighted that all reports are delivered completely and at the right time by following up with the facility level to send complete monthly reports by the designated deadline. Sometimes they use phone calls as reminders to submit the reports on time.

Our findings in regards to completeness and timeliness of reporting are similar to those of a WHO DQR conducted in the Gambia on the immunization program in 2019 (Sowe & Gariboldi, 2020). On the contrary, when the same data quality review was conducted on maternal and newborn indicators in the state of Gombe, Nigeria in 2017, the completeness threshold was barely met, and the timeliness threshold was not met. This is due to their use of a paper-based system in referring women from rural to urban health facilities whereby referrals accumulated before they were filed. There was no follow up between district facilities and the primary care level, especially in rural areas (Bhattacharya et al., 2019).

5.2.2 Domain 2 - Internal Consistency of Reported Data

The results of this study show that there were no extreme outliers in the three indicators. This implies that there is a good follow up from the district level on the facilities. The program supervisors interviewed stated that all users at the facility level receive comprehensive

training on data entry for HMISs. They also noted the importance of good follow up from the district level to the facility level, especially at the end of each month. For the moderate outliers this study found 3.3% of data with moderate outliers at national level; i.e. West Bank. This is also a very small percentage for the same reasons stated above.

Using Z-score for moderate outliers, which is the preferred method when there is a large variability in the reported monthly data, the data represented an average of 4% moderate outliers in the three indicators. 6% of data had moderate outliers and two districts had more than two moderate outliers in the family planning tracer indicator. It is expected that this is due to opening new clinics in Jericho and Ramallah districts.

3% of the data has moderate outliers (using Z-scores) in pregnancy & childbirth of care and the Ramallah district is the only district that has equal or greater than two moderate outliers of the reported monthly data mean. In regards to the child immunization tracer indicator, Jericho district was the only district that has more than two moderate outliers of the reported monthly data.

Consistency over time of the family planning tracer indicator showed an increase of 20% higher than the average of the three preceding years. This was explained by the Community Health Department in the Palestinian MOH that an awareness campaign was launched in each PHC clinic before starting to use the family planning registry that was established by the Palestinian MOH with the collaboration of PNIPH. Nevertheless, this result from 2019 is the same as result from the previous year, which shows that despite the success of the initial

campaign, more actions are needed to encourage increased use of family planning units in the PHC clinics.

The 2019 MICS survey shows that the percentage of women who use modern family planning methods was 42.8% while it was 44.1% in the 2014 MICS (PCBS, 2014). This indicates that there is a crucial need to conduct a national awareness campaign of the benefits and advantages of using modern family planning methods at a national level. The results of our study showed that Tubas and Nablus districts are the only districts that have divergent scores to the pattern of the family planning tracer indicator trend.

Regarding the pregnancy & childbirth care tracer indicator, it was expected to increase over time because of increasing in the awareness of the community due to the MCH program campaign in PHC clinics about the benefit of antenatal visits. Moreover, introduction of the family medicine program in the Palestinian MOH has likely contributed to spreading awareness. The results show that this indicator has high percentage of divergent values in six districts. According to the opinion of the MCH program supervisor in the Palestinian MOH, the high percentage of divergent values were because there were some missing data in 2016 of ANC 4th visit. Data were neither captured nor retrievable in 2016 since the ANC 4th visit tracer indicator was not captured in the Palestinian MOH. All data regarding ANC 4th was based on a population-based survey i.e. MICS survey. Moreover, the MCH e-Registry program was established in 2016 in some clinics in five districts in the West Bank. So, the other six districts had no electronic records about ANC 4th. This illustrates why there were divergent values of the trend of ANC 4th in these six districts, which did not have an MCH e-Registry in 2016.

The results of the child immunization tracer indicator showed that there were no divergent values in all districts. Comprehensive training on data entry and using HMISs in immunization programs was conducting when adding new clinics to the immunization program. This complies with the WHO classification of the Palestinian Expanded Program in Immunization (EPI); that is, the Palestinian EPI is one of the most successful EMRO/MENA region with more than 95% coverage for more than a decade (WHO, 2017a).

Consistency between related indicators in family planning showed that the relation between the modern family planning indicator and family planning follow up visits is 47%, which was aimed for by the community of health department (expected 50%) in the Palestinian MOH. Understandably, there are better indicators to choose from to assess consistency between related indicators for the family planning tracer indicator; nevertheless, the family planning follows up visits was the only other indicator that is captured in the Palestinian MOH in the family planning program.

Regarding the pregnancy & childbirth care tracer indicator, our study found a 56% national score for ANC4th and ANC1st, although it should be a much higher relationship between the two indicators according to the program supervisor in the Community Health Department in the Palestinian MOH, which is responsible for ANC visits. This consistency level of 56% is because most clients of perinatal care in the Palestinian MOH facilities register in MCH e-Registry to ensure eligibility for any possible future needed referrals for treatment outside the MOH facilities as per the referring protocol in the Palestinian MOH insurance scheme, which is required of patients.

The DPT3 result was 100% consistent with DPT1 with no divergent scores since every child who takes DPT3 will have already taken DPT1. Some children will take DPT1 in 2019 and DPT3 in 2020, but at the same time some took DPT1 in 2018 and DPT3 in 2019. These results show again the successful immunization program in WHO classification of immunization programs in the Middle East Region (WHO, 2017a).

Internal consistency of reported data in the Gambia was good consistency for immunization (more than 99% consistent) with no outliers. Compared to the Palestinian child immunization tracer indicator's internal consistency (100%), this illustrates the effect of using an electronic system to enhance data quality (Sowe & Gariboldi, 2020). However, in Gombe State, Nigeria, the data were incomplete and showed inconsistency over time with related indicators and with external data sources. This was because they were still using paper reporting in some rural facilities or in referring to other facilities in urban areas. They were stacking paper on the facilities level in rural areas and delay the filling of electronic data or sometimes not filing at all, since referring patients between rural and urban areas used a paper-based and not computerized system (Bhattacharya et al., 2019).

5.2.3 Domain 4 - External Consistency of Population Data

In this domain the tool compared the data of live births from the Palestinian official statistical office (PCBS) with the UN population projection for Palestine. The tool gives choices for only countries to compare the official statistical data with the UN population projection of that country (not regions, like the West Bank). Since the study was conducted in the West Bank, the tool result was 53%, which is considered a good agreement as a percentage of the West Bank to Palestine. The number of live births in Palestine, which was 137,361 in 2019

including 81,333 live births in the West Bank, was considered, which is 59.2% of the Palestinian live births (PCBS, 2020). Therefore, 53% external consistency of the West Bank live births with UN projection is considered as a good degree of agreement.

This domain also compares the population data between HMISs in the Palestinian MOH with the same data from the PCBS. This data includes the following: Expected pregnancies; Live births; Children < 1 year of age; and Total population. The available data that is captured in the Palestinian MOH was Live births and Children < 1 year of age.

The live birth ratio to Children < 1 year of age was 90%, which is excellent agreement. The districts with divergent scores were in districts that have rural and Bedouins populations and large areas classified as Area C. The main reason for that is the difficulty to reach health facilities in these areas.

External consistency of population data was not assessed in the Gambia, because the official statistical office could not provide the needed data format (Sowe & Gariboldi, 2020), which is the same issued faced in our study for the third dimension.

5.2.4 Tracer Indicators Calculations

Although UHC is increasing globally, the 2020 UHC Global Monitoring Report illustrates less progress in the Middle East (Mataria et al., 2020). However, when calculating the tracer indicators, the results for Palestine were good compared to the last population-based survey conducted in Palestine in 2019.

Comparing the results of the study with other results showed that family planning and child immunization have good captured data in the West Bank. This ensures that capturing these indicators can be calculated in a more accurate and up-to-date way using electronic reporting

of integrated systems of service delivery. However, results on the pregnancy & childbirth care indicator show that there is a huge amount of data that have not been captured. More accurate data has been collected through the population-based survey (MICS in the Palestinian case). This result was due to the private sector providing a huge percentage of the pregnancy & childbirth services in the West Bank, data for which is not captured by the Palestinian MOH. Private clinics and physician services are also not captured, and in some cases even if they are recorded they prefer not to publish them since they have to pay taxes for their services. Many regulations and efforts should be included for enhancing capturing this indicator's data.

Comparing these indicators with the region's indicators shows that the Palestinian immunization program is much more comprehensive than the other countries in the region. This is due to the fact that all immunizations in Palestine are recorded and captured in the Palestinian MOH.

In other tracer indicators, better integration between the private sector and the governmental sector will increase the percentage of service coverage. Private sector entities, especially physicians' clinics, have issues in recording clinical data and sharing them with responsible governmental offices.

CHAPTER SIX: CONCLUSIONS

6.1 Conclusion

Based on the results for the three tracer indicators, the completeness and timeliness of reporting was high in the three tracer indictors. However, consistency of reporting varied between the indicators. The immunization program result was excellent in the three dimensions of the DQR. Nevertheless, the results of family planning and pregnancy & childbirth of care tracer indicators showed less coverage and lower consistency over time with the mean of the three preceding years. Moreover both indicators represented poor ratios for consistency with other related indicators in the same program.

The family planning and pregnancy & childbirth care programs need much more focus from the Palestinian MOH and assessment to enhance the health output at the national level, which should involve all stakeholders in a national action plan that will fill the gaps in capturing indicators of these programs.

The UHC SCI can be measured and assessed by using the WHO DQR toolkit. Due to time limitation, our study focused on three tracer indicators; all the 14 tracer indicators can be measured and assessed in future for better representation of the health status in Palestine. Indeed, the Palestinian MOH should place a great emphasis on establishing a real Palestinian UHC SCI.

6.2 Strengths of the Study

Despite all of the barriers and challenges related to collecting data in the presence of COVID-19 with lockdown in the whole country, our study was done with the following strengths:

- This is the first study to address UHC SCI RMNCH in Palestine and to use the WHO DQR toolkit in Palestine.
- Our study is the first study to calculate the UHC SCI RMNCH from the MOH electronic databases.
- The study is considered as the baseline of any future DQR in the Palestinian MOH.
- The study paved the way for the departments that are responsible for the services of the three tracer indicators; i.e. family planning, pregnancy & childbirth care and child immunization, to use the tool for future DQR and periodic monitoring and evaluation.

6.3 Recommendations

The results of the study indicate some recommendations for better capturing the three tracer indicators and enhancing coverage of the services as the following:

- The Palestinian MOH should give more attention to family planning services in the governmental PHC clinics to increase the numbers of beneficiaries of the service through awareness campaigns by using social media, conferences and public meetings to highlight the benefits of family planning for the population, especially for Bedouins and residents of Area C, since the results indicated that they have divergent values to the trend of the indicator.

- Results related to the pregnancy & childbirth care tracer indicator show a need for an action plan to enhance coverage and consistency over time and consistency of related indicators. ANC 4th visits need to be increased in the governmental facilities for better capturing of the indicator. Moreover, taking the financial issue in consideration, encouraging beneficiaries of pregnancy & childbirth care services to move from the private sector to the governmental sector will comply more with the UHC goal (Health for all).
- Integration between private sector entities and associations that provide health services with the Palestinian MOH needs to be established to capture and cover more representative pregnancy & childbirth care.
- More cooperation is needed between the Palestinian MOH and the PCBS to facilitate publishing the needed population data for the third dimension i.e. external consistency of reported data.
- Data warehousing for electronic systems need to be established at a national level to provide more accurate captured data from all stakeholders.
- Periodic DQRs for the services provided by the Palestinian MOH should be conducted on a yearly basis and should adopt the other two modules that are: Module 1: Framework and metrics and Module 3: Data verification and system assessment. This will enhance the data quality in the Palestinian MOH tremendously.
- Innovative solutions for capturing data of private physicians are needed for more accurate and representative tracer indicators. For example, developing unified free software to be used in private physicians' clinics would be one such solution.

- Adoption of the WHO DQR toolkit by the Palestinian MOH will enhance the data quality and indicate the strengths and weakness in service childbirth and provide monitoring and evaluation of the ministry data quality on a regular basis.

6.4 Future Research

The result of our study indicates that there is a need for the following future research:

- Initiate a focus study on family planning and pregnancy & childbirth care indicators to enhance the coverage and investigate the consistency within each program indicator.
- Investigate the family planning program to choose more indicators to be captured and enhance accuracy and consistency of family planning services.
- Conduct a study to investigate the data quality of the other UHC SCI categories which are: (1) Infectious diseases (2) Noncommunicable diseases and (3) Service capacity and access in Palestine.
- Establish a national plan for measuring the full set of UHC SCI indicators and assessing their quality.
- Assess the third dimension of DQR; consistency of external reporting in cooperation with the PCBS.
- Conduct a DQR for other UHC SCI tracer indicators that need to be conducted in the Palestinian MOH on a regular basis for periodic monitoring and evaluation of the ministry data quality.

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APPENDICES

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State of Palestine
Ministry of Health
Minister's Office

دولـــة فـلسطين
وزارة الصحة
مكتب الوزير

القدس
al QUDS

الاستاذ الدكتور علي زيدان ابو زهري حفظه الله
رئيس الجامعة العربية الامريكية

تحية طيبة وبعد،،

الموضوع : التعاون بين الجامعة العربية الامريكية وقسم المعلومات الصحية في وزارة الصحة الفلسطينية لاجراء دراسات في مجال المعلوماتية الصحية والخدمات الصحية المقدمة للمواطن

تهديكم وزارة الصحة أطيب التحيات ، وبالاشارة الى كتابكم بخصوص الموضوع المذكور اعلاه ، يرجى العلم انه لامانع لدينا من الحصول على المعلومات الصحية اللازمة من طرفنا لاجراء الدراسات الصحية، على ان تزودونا بنتائج هذه الدراسات .

وتفضلوا بقبول فائق الاحترام والتقدير ،،،

وزير الصحة
د. جواد عواد

الاخ ا.د. وليد ذيب الحمد
للاطلاع واجراءاتكم
٢٠١٩/٦/٢٤

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بسم الله الرحمن الرحيم

حضرة مدير الصحة العامة

الدكتور ياسر بوزية المحترم

تحية وبعد

الموضوع : مساعدة باحث على تجميع بيانات متعلقة بالتغطية الصحية الشاملة

يرجى علم حضرتكم أنني بصدد إعداد رسالة ماجستير تخصص معلوماتية صحية من الجامعة العربية الأمريكية تحت عنوان " تقييم جودة البيانات للتغطية الصحية الشاملة في الضفة الغربية – فلسطين للعام 2019 " كما وأنني بحاجة إلى جمع بيانات متعلقة بصحة الأم والطفل والصحة الإنجابية والطعومات المتعلقة بالأطفال.

يرجى من حضرتكم الموافقة على تسهيل جمع البيانات المتعلقة بالتغطية الصحية الشاملة لمؤشر RMNCH.

مع الاحترام

م.علاء أبو فرحة

2020/4/6

دولة فلسطين - وزارة الصحة
الإدارة العامة للصحة العامة
وارد رقم:
التاريخ: 14/2/2021

14/2/2021

الملخص

المقدمة: تم دراسة البيانات الالكترونية الموجودة في أنظمة الصحة الالكترونية المتوفرة في وزارة الصحة الفلسطينية وشركائها لحساب مؤشرات تغطية الخدمات الصحية للوصول وتحقيق التغطية الصحة الشاملة في فلسطين. وهو المؤشر رقم 3.8.1 من اهداف التنمية المستدامة. تم اختيار الفئة الأولى من هذا المؤشر والتي تحتوي على الصحة الإنجابية وصحة الام، المواليد الجدد، والطفل. هذه الفئة بدورها تحتوي المؤشرات التالية: تنظيم الاسرة، رعاية الحمل والولادة، مناعة الطفل، علاج الأطفال (الاعراض الناتجة عن الالتهاب الرئوي)

تم تحديد وتقييم توفر البيانات ومصداقيتها وجودتها لإنشاء وحساب المؤشرات المتعلقة بتغطية الخدمات الصحية المتعلقة بالتغطية الصحية الشاملة في قسم الصحة الإنجابية وصحة الام والطفل.

مشكلة الدراسة: لا يوجد تحديد واضح للبيانات ومصادرها لتحديد التغطية الصحية الشاملة وتغطية الخدمات الصحية في فلسطين، ولا يوجد سياسة واضحة لألية احتسابها، ولم يتم مسبقا انشاء مؤشر التغطية الصحية الشاملة في فلسطين، او فحص جودة البيانات الخاصة بها.

الأهداف: تحديد البيانات الالكترونية المتوفرة ومصادرها. بحث مدى جودة البيانات اللازمة لاحتساب وإطلاق مؤشر تغطية الخدمات الصحية، وتقييم ما يلزم لبناء مؤشر التغطية الصحية الشاملة لفئة RMNCH في فلسطين

وسائل البحث: البحث اعتمد على تصميم الأثر الرجعي، حيث تم جمع البيانات من عدة قواعد بيانات خاصة بوزارة الصحة وشركائها، وتم تحديد جودة البيانات المتوفرة في وزارة الصحة الفلسطينية عن طريق استخدام WHO DQR toolkitرزمة ادوات مراجعة جودة البيانات الصادرة عن منظمة الصحة العالمية وذلك لفحص مجالات جودة البيانات. وحساب المؤشرات المتعلقة بتغطية الخدمات الصحية في قسم الصحية الإنجابية وصحة الام والطفل.

النتائج: تحديد البيانات الالكترونية المتوفرة ومصادرها. بحث مدى جودة البيانات المتوفرة في وزارة الصحة الفلسطينية، وتقييم ما يلزم لبناء مؤشر التغطية الصحية الشاملة.

الخلاصة: احتساب المؤشرات المتعلقة بتغطية الخدمات الصحية الشاملة في القسم المتعلق بالصحة الإنجابية وصحة الام والطفل، وتقييم جودة البيانات حيث خرجت الدراسة بان مؤشر المطاعيم الفلسطيني على درجة عالية من الكمال ويسلم في الوقت المحدد وعلى درجة عالية من التجانس الداخلي بين البيانات الخاصة بالبرنامج، اما مؤشر الصحة الإنجابية ومؤشر صحة الام فهما بحاجة الى التحسين من حيث تجانس البيانات الداخلية في البرنامجين (برنامج الصحة الإنجابية وبرنامج صحة الام). هذه الدراسة هي اول خطوة مبنية على أساس علمي لإنشاء مؤشر التغطية الصحية الشاملة في فلسطين.