Reproductive Health Inequalities in Egypt:

Evidence for Guiding Policies

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List of Acronyms

ANC: Antenatal care
CSDH: Commission on the social determinants of Health
CI: Concentration Index
C-section: Caesarean section
CV: Coefficient of variation
EDHS: Egypt Demographic and Health Survey
EHIS: Egypt Health Issues Survey
ICPD: International Conference on Population and Development
ID%:   Index of Dissimilarity Percent
FGM/C: Female Genital Mutilation/Cutting
GBV: Gender-based Violence
GCC: Gulf Cooperation Council
Gini: Gini Coefficient
HS: Health System
HSS: Health system Strengthening
IVF: In-Vitro Fertilization
MOHP: Ministry of Health and Population
PoA: Programme of Action
PAF: Population attributable fraction
RII: Relative index of inequality
rCI%   Concentration Index Redistribution Need Percent
SDH: Social Determinants of Health
SDHI: Structural Determinants of Health Inequity
SII: SII
SRC/AUC: The Social Research Center of The American University in Cairo
SRH: Sexual and Reproductive Health
SRHR: Sexual and Reproductive Health Rights
STDs: Sexually transmitted diseases
STIs: Sexually transmitted infections
Theil T: Theil index of inequality
UNFPA/ASRO: United Nations Population Fund for Arab States Regional Office
USAID: United States Agency for International Development
WHO: World Health Organization
wMD: Weighted absolute mean difference
wSD: Weighted standard deviation

Executive Summary

<u>**Setting the Stage**</u>

Egypt socio economic realities places it as a low middle income country facing numerous development challenges, particularly in terms of economic resources, imbalance between country resources and high population growth with a plateauing followed by a decline in fertility levels and low female labor force participation.

The expenditures on the health system in Egypt is half the target pledged in its constitution, government health services are not attractive to the pool of human resources who seek jobs abroad or in the private sector, out of pockets expenditures on health is high with the universal health insurance coverage not getting in force.

Despite these limitations, progress is witnessed on the health and social fronts as reflected in the increase in life expectancy and educational enrollment.

<u>**Sexual and Reproductive Health Commitments and Efforts in Egypt**</u>

Sexual and reproductive health are central on the political agenda. This is demonstrated in many legal articles and reforms supporting a more favorable regulatory framework related to the sexual and reproductive health and in the adoption of an ambitious health and population strategy, as well as the endorsement of political declarations and international commitments.

The health strategy (2015-2030) and the population strategy (2015-2030) , in particular, include an articulated strategy for reproductive health that were translated to address many fronts of sexual and reproductive health, particularly in terms of increased access to services and to the wider inclusiveness of reproductive health services by age groups and marital status.

The analysis pointed out, though, to a number of issues within the life course perspective of sexual and reproductive health that appear not to be receiving sufficient attention and also presented the type of limitations in addressing these issues. The issues highlighted are puberty, consanguineous marriage, infertility, reproductive cancers and menopause.

It should be noted that the information base in Egypt is quite rich and the accessibility of Demographic and Health Survey data in particular is an asset that allowed this report to conduct the needed in-depth analysis. The available data allowed us to cover a reasonable, but of course incomplete number of indicators and to conduct a trend analysis.

<u>**Framework and Methodology**</u>

The framework adopted uses the conceptual framework of the commission on the Social Determinants of Health as the point of departure but introduces two adaptations central to the current investigation.

The adaptations include "Introducing the Distribution of Gendered Norms as a Social Stratifier of SRH Inequalities" and "Thorough incorporation of the Fairness of Health Care System and its Relative Contribution as a Social Stratifier of sexual and reproductive health inequality". The gendered norms are assessed through the introduction of the gendered cultural context index that captures gendered attitudes and their manifestation in gendered behaviors. The incorporation of the

fairness of Health Care System made use of the World Health Organization Operational Health System Strengthening Monitoring Framework to monitor the Health System capacity and performance as Social Determinant of Health influencing the sexual and reproductive health and their uneven distributions.

The importance of these adaptations relate to a recognition of the centrality of gender norms as a force shaping sexual and reproductive health. And to the important role played by the health system in addressing and preventing sexual and reproductive health challenges and in the being responsive to the different needs of different social categories.

Based on an extensive literature review and a systematic approach, a list of 57 sexual and reproductive health indicators were identified to capture the landscape of SRH. This list was incorporated within 3 domains: sexual and reproductive health impact indicators, sexual and reproductive health risk factors and health system determinants domain.

The availability of these 57 indicators in the existing data sources were investigated using the Demographic and Health Survey in 2014 and the Egyptian Health Issues Survey in 2015. The Demographic and Health Survey in 1995 was used for trend analysis. To allow ranking all indicators were expressed as a negative aspect of health.

The social stratifiers investigated cover geographic, wealth, gender norms classifications. Also the health system was investigated as a social determinant.

Based on a critical comparative assessment of different measures of inequality. The decision was to implement the index of dissimilarity expressed in percent for non-ordered categorical social stratifier and the concentration index redistribution need for the ordered social stratifier. A cut off point to identify the priority inequality is defined as index of dissimilarity expressed in percent and concentration index redistribution need $\geq 10\%$. Also to illustrate the different weight of the distribution of the investigated social stratifiers producing sexual and reproductive health inequalities for different health outcome, as well as to demonstrate a tool that can be used to guide health programs targeting a particular dimension of sexual and reproductive health in prioritizing among different distribution of stratifiers, the decomposition tool was presented and applied on two priority sexual and reproductive health inequality, namely multiparty and infant mortality.

The Analysis of Sexual and Reproductive Health and Sexual and Reproductive Health Inequality Challenge
Sexual and Reproductive Health Challenges
Despite general progress, and quite impressive progress on maternal mortality fronts, a number of sexual and reproductive health impact and risk factors continue to be relatively high vis a vis the international and regional levels. These include infant mortality, neonatal mortality and self-reported sexually transmitted diseases or their symptoms. According to recent unpublished data there is a progress in both neonatal and under 5 mortality between 2014 and 2018, but they still remain high. Furthermore it should be noted that due to the unavailability of data, sexual and reproductive health morbidity measures were not fully covered. In terms of risk factors it was showed that consanguineous marriages and marital violence (physical, sexual and emotional), as well as anemia are priority challenges.

Inequalities in Sexual and Reproductive Health Distribution

The priority SRH challenges are not necessarily the priority sexual and reproductive health inequalities. Some sexual and reproductive health conditions as self-reported sexually transmitted infections, anemia among women in the reproductive age and marital violence are nationwide priorities that are not significantly unequally distributed among the geographic locations, wealth quintiles and gender strata.

Other sexual and reproductive health conditions as neonatal mortality, infant mortality and consanguineous marriages are not just high, but are also concentrated in Rural Upper Egypt and among the most gender conservative. While female genital mutilation/cutting in the 1-14years old girls, early age at marriage, multiparity and adolescent childbearing are relatively not highly prevalent but are priority geographic, wealth and/or gender inequalities. It is also worth mentioning that urbanization and the life style in such settings, notable among the economically enabled is still a matter of concern. The urban life style, the culture sensitivity and serious stigma towards diseases transmitted by sexual route, as sexually transmitted infections and hepatitis B viral infection, contribute to their unperceived existence.

Trend in SRH Inequalities

The decline in overall averages does always translate into a tapering inequality gap. Infant mortality, neonatal mortality, female genital mutilation/cutting, consanguinity and multiparity showed a decline over the past 10years, but the geographic inequalities widened with Rural Upper Egypt carrying the highest burden. Adolescent childbearing is on rise and is concentrated in Lower Egypt, Rural Upper Egypt and the Frontier Governorates. Furthermore, early age at marriage declined with a significant decline in Rural Upper Egypt narrowing the geographic inequality gap.

Health System Responsiveness to Sexual and reproductive Health and Sexual and reproductive Health Inequalities Needs

Health System Responsiveness to Sexual and reproductive Health Needs

The top healthcare system performance challenges fall in the prevention programs and the reproductive healthcare. Over 97% of ever-married 15-49years old women never had breast cancer screening, while over 90% of men and women do not have HIV/AIDS comprehensive knowledge. Cesarean section deliveries are strikingly very high accounting for over half of deliveries. Over 40% of non-pregnant currently married 15-49years women do not use a contraception method. The top health system capacity challenges reside in the availability of services. These challenges include unavailable medication and unavailable healthcare provider

Health System Responsiveness to Sexual and Reproductive Health Inequality Needs

Access to sexual and reproductive health services is generally least among the Rural Upper Egypt, the poorest quintile of the population and the least conservative. The top health system performance inequalities include birth unattended by skilled provider, home deliveries, lack of antenatal care and postnatal checkup. The top health system capacity inequalities include distant healthcare facilities and unaffordable healthcare services, as well as difficult transportation. The only exceptions are cesarean section deliveries and lack tetanus vaccination during the antenatal period which are more prevalent among the Urban governorates, Urban Lower Egypt, the richest quintile of the population and the least conservative.

The Relative Importance of the Distribution of Different forces: A Decomposition Analysis
The decomposition analysis offers a tool to prioritize the distribution of one type of stratifier than the other when a particular measure of health is targeted and resources are limited.

For example, two illustration examples of decomposing the wealth -based inequalities in multiparity and infant mortality revealed differences in the relative importance of the different forces relating to their inequalities. For multiparity, the illustration showed that early marriage was the dominant force responsible for 24.6% of the wealth-based inequality in multiparity. This followed by living in localities characterized with best supportive health system for low parity which is responsible for 21.1% of this wealth based inequality and living in the least conservative gendered cultural context which is responsible for 19.2% of this inequality.

For infant mortality, the illustration showed that living in localities of best environmental context was responsible for its wealth-based inequality and was responsible for 66.7% of this inequality. This was followed by living in urban Lower Egypt, which is responsible for 21.2% of this inequality.

The two illustrations revealed that while the health system services might be part of the remedy SRH inequalities, other social forces are more important and can substantially reduce these inequalities. Identifying these forces can pave the way towards effective and efficient policies to tackle SRH inequalities for specific targets

 The Fairness of Structural Determinants

The last section of the report moved the discourse from inequality to equity. It poased the question on the fairness of structural determinants producing social stratification and also influencing the responsiveness of the health system.

In particular, the study identified six main domains and introduced the questions whether, within each of these six domains, the policies and actions are succeeding in serving: achievement of a **FAIR** distribution of resources, opportunities, services as well as **FAIR** distribution of power relations, inclusiveness and voice among social groups. The question also investigates whether policies and actions aim to change the environment of behaviors to enable those in disadvantaged positions to adopt choices to improve their lives, including their health.

The analysis showed that geographic regions in Egypt lend themselves to the concern of unfair allocation of equal opportunities to resources for health (education, employment, gender norms, ….) as well as to the unfairness in the health system responsiveness to different needs of social groups (demonstrated in part four).

In terms of the distribution of wealth and gender norms by region, the fact that these stratifiers are not randomly distributed across regions and are clustered in deprived areas is in itself reflection of unfairness. Clearly the unfair policy for national resource allocations and health system provision manifested itself in the nonrandom distribution of poverty and conservative norms by region.

The preliminary evidence that exist point to the maldistribution of the opportunities for wealth production by social groups. Data and studies are available to indicate the inequitable: access to early childhood development services, to enrolment in schools, to access to higher education, to decent employment, as well as to loans and training by social class.

In terms of distribution of gender norms, the analysis indicated that there is no evidence to suggest that there are specific gender policies responsible for the production of the distribution of gender norms. What is suggested is the importance of recognizing that gender norms are not equally distributed and of adopting policies and actions that specifically target these differences in norms.

The above discussion of the three social stratifiers reveals the strong overlap and clustering of vulnerability among them. Rural Upper Egyptian women are living in the poorest households and residing in highly conservative communities. Therefore, tackling SRH inequality in within one social stratifiers can contribute in addressing inequality in the other two stratifiers. However, the three social stratifiers offer different policy and program intervention entry points that enforce each other for tackling SRH inequalities produced by the underlying structural determinant.

Policy Implications

The report touched briefly on a number of policy implications, mainly:

- The commitment to SRH policies and actions which have translated itself into progress on many fronts of SRH as well as in the availability of a reasonable evidence base needs to be built upon to address the unfinished agenda of SRH. Also many missing dimensions of SRH that are not centrally on the agenda require more data and efforts to address the challenges.
- The commitment to addressing SRH inequality needs to be demonstrated through an information system capable of systematically measuring, monitoring and tracing inequality to their structural root causes and to the fairness of these causes.
- The challenge of SRH inequality requires more attention, particularly, given the high level of inequality and the fact that the priority SRH inequality challenges are different from priority SRH challenge.
- The health system needs to continue its efforts to address sexual and reproductive health system related challenges. Many of these can not be addressed by the health sector on its own but call for the contributions of other social sectors.
- Health system performance and capacities should be more responsive to differentiated SRH needs of social groups.
- Structural policies (particularly those related to governance, distribution of regional allocation of resources, and wealth, as well as gender norms) need to adopt an equity lens. Such a lens require that these policies adhere to the principle of equal transformative opportunities to all social groups, complemented by adopting the approach of targeting and

positive discrimination (sometimes referred to as proportional universalism) to address the unfair distribution of social stratifiers.

Introduction

This analytic report is produced by the Social Research Center of the American University in Cairo (SRC/AUC) as an implementing partner of the United Nations Population Fund for Arab States Regional Office (UNFPA/ASRO). It is part of a regional initiative launched by UNFPA/ASRO in five countries (Egypt, Jordan, Morocco, Oman and Sudan).

The regional initiative builds on the many shifts in international thinking and aims to provide the needed evidence and recommendations to support a policy movement for the promotion of Sexual Reproductive Health (SRH) and the achievement of SRH equity in the Arab region. Such a movement is very much aligned with the Arab region commitments to achieve the sustainable Development Goals.

The five country reports are intended to analyze the existing data on SRH to determine the priority challenges of SRH and SRH inequalities, and to investigate key issues related to the distribution of SRH inequalities and fairness of policies and services.

The national analytical reports ask the simple frequently asked question "why SRH inequalities are occurring?" but they consciously investigate this question using the new Structural Determinants of Health Inequities (SDHI) frame and not the commonly used Social Determinants of Health (SDH) frame. The approach adopted in these analytical reports is consistent with the equity discourse and the call for policy reforms that are currently gaining momentum but have not yet gained the prominence they deserve and have not filtered in the conscious mind of many policy actors.

The specific objectives of this analytic report are to:
- Investigate Egypt's efforts in response to the SRH commitments
- Introduce a systematic approach to generate evidence on the priority SRH challenges and the priority SRH inequality challenges.
- Provide empirical evidence on the SRH priorities, assess the degree and trend of inequalities in SRH challenges across key stratifiers, as well as the similarities /dissimilarities between priority SRH and SRH inequalities
- Investigate health sector (HS) responsiveness to SRH and the unequal distribution of HS components among different social groups
- Demonstrate the use of decomposition analysis to prioritize among different stratifiers.
- Investigate the fairness of structural determinants producing social stratification and touch on their policy implications.

The report is organized in six parts.

Part One describes the country's current socioeconomic and health realities. It investigates the national environment surrounding the SRH and Egypt's efforts to meet SRH objectives.

Part Two presents the adopted framework, conceptual thinking and the methodology.

Part Three provides empirical evidence on the SRH priorities and their uneven distributions. This part also identifies the underprivileged population social groups and the trend overtime in the inequality among social groups.

Part Four pays attention to the HS capacity and performance in SRH and its unequal distribution among different social groups.

Part Five introduces the decomposition analysis and present two illustrations for its use in prioritizing among different social stratifiers.

Part Six draws on the key findings to investigate the fairness of structural determinants and reflect on key policy implications.

Part One: Sexual and Reproductive Health Politics and Policies

I.1. Setting the Scene

- Egypt has made marked improvement in the social, economic and health fronts, however, numerous challenges persist.
- Egypt population is on rise approaching 100millions with the total fertility rate plateauing at 3.2 child per woman
- The economy is putting a break on development efforts and women showing unequal access to education and labor force participation
- Governmental health expenditure is at half of the target pledged in the 2014 Constitution
- The health insurance law has not yet come to force putting enormous burden on the out-of-pocket expenditure on health.
- Low remuneration and low motivation push health care professionals to either seek employment opportunities abroad or have multiple jobs in the public and private sectors within the country leading to deficient health services.

Egypt is classified by the World Bank as a lower-middle income country. Though Egypt has shown marked progress in a number of indicators, numerous challenges persist (Table 1). Egypt is the most populous country in the Arab region. The country's population has nearly doubled in the past two decades and is estimated at 95.7 million in 2016. The youth aged 18-29 represent a quarter of Egyptian population and the youth bulge that started in 1995 is expected to continue till 2045[1]. Over the past 25years, the female and the male life expectancy at birth increased by 6 years while the total fertility rate remains stagnant, ranging between 3.2 and 3.3 children per woman.

The gross domestic product (GDP) per capita has nearly doubled from $5,909.2 in 1990 to $10,319.3 in 2016. However, the economic growth lags behind and unequal distribution of income across the population is noted with a Gini index of around 31.8%. The unemployment rate remains high, particularly among women, where their participation in the labor market is persistently weak. Around one out of three men and three out of four women do not participate in the labor force.

Egypt has demonstrated a strong commitment to education. The country has made much improvement in primary school enrollment covering the majority of girls and boys. However, inequitable access to education is encountered as 87.9% of girls are enrolled in primary school as compared to 97.1% of boys. In addition, one fifth of men and more than one third of women over 15years of age remain illiterate.

Egypt has met its MDG7c target of halving the proportion of the population without sustainable access to safe-drinking water and basic sanitation[2]. In 2010, 98.3% of people had access to improved water sources, yet around half of the population did not have access to safely managed sanitation. It is also worth mentioning that people's access to electricity has increased from 94.0% in 1990 to 100.0% in 2016.

As shown in Table 1, the government has modest expenditure on health putting much burden on people's out-of-pocket contributions. The government expenditure on health is reduced from 1.8%

of the GDP in 2000 to 1.4% in 2010 and the government contribution to health expenditure is reduced from 6.1% of the general government expenditure in 2000 to 4.3% in 2010. The low level of public investment in health has led to high levels of out-of-pocket health expenditure and has reinforced domination of market forces through the increased involvement of the private sector and a general commercialization of health services. Over 60% of the expenditure on health is out-of-pocket putting huge financial burden on households.   The per capita out-of-pocket health expenditure increased from $189.4 per capita in 2000 to $264.1 in 2010.

Table 1: Egypt Key indicators

	Indicator	1990	2000	2010	2016
Population	Total population (millions)	57.4	69.9	84.1	95.7
	Female life expectance at birth (years)	68	71	73	74
	Male life expectancy at birth (years)	63	66	68	69
	Total fertility (total births per woman)	N/A	3.2	3.2	3.3
Economy	GDP per capita (PPP constant 2011 international $)	5,909.2	7,388.4	9,857.5	10,319.3
	Gini Index (World Bank estimate) (0 equality to 100 inequality income distribution)	32	N/A	31.5	31.8
	Female labor force participation (% of female population ages 15+ - national estimate)	23.2	21.6	24.5	23.9
	Male labor force participation (% of male population ages 15+ - national estimate)	73.2	45.0	75.0	69.6
Education	Female net Primary school net enrollment (% of females in official school age)	N/A	81.8	N/A	87.9
	Male net Primary school net enrollment (% of males in official school age)	N/A	86.2	N/A	97.1
	Female adult literacy rate (% of females aged 15 and above)	N/A	N/A	63.5	N/A
	Male adult literacy rate (% of males aged 15 and above)	N/A	N/A	80.3	N/A
Infrastructure	People using at least basic drinking water services (% of population)	N/A	98.2	98.3	N/A
	People using safely managed sanitation services (% of population)	N/A	52.7	58.0	N/A
	Access to electricity (% of population)	94.0	97.7	99.6	100.0
Health expenditure	Domestic general government health expenditure (% of GDP)	N/A	1.8	1.4	N/A
	Domestic general government health expenditure (% of general government expenditure)	N/A	6.1	4.3	N/A
	Domestic general government health expenditure (per capita, PPP (current international $)	N/A	106.6	138.8	N/A
	Out-of-pocket expenditure (% of current health expenditure)	N/A	62.5	62.6	N/A
	Out-of-pocket expenditure per capita, PPP (current international $)	N/A	189.4	264.1	N/A
Health work force	Physicians (per 1,000 population)	N/A	2.1	2.8	N/A
	Nurses and midwives (per 1,000 population)	N/A	N/A	3.5	N/A

Source: World Bank DataBank. Available at http://databank.worldbank.org/data/source/world-development-indicators. Accessed on June 6, 2018

Egypt faces a unique situation of oversupply of health workforce with an adjunct artificial shortage[1,3]. From the available information, there are around 3 physicians and 4 nurses per 1,000 population. Almost all healthcare professionals in public practice work in the private sector and there is barely health professionals who work uniquely in one sector. Moreover, the low remuneration and low motivation, push health care professionals to either seek employment opportunities abroad especially in the Gulf Cooperation Council (GCC) countries or have multiple jobs in the public and private sectors within the country. Those working abroad and those in multiple job assignments still retain their original employment in the government and academic sectors resulting in theoretically overcharged services but practically unfulfilled duties and increased absenteeism.

I.2. Sexual and Reproductive Health Commitments and Efforts

- At the level of the national and international commitments and efforts, Egypt is a country where human rights related to SRH are respected and inspired to be protected and fulfilled.
- On national level, the laws, strategies and programs seek to provide SRH protection and services
  - The laws prohibit marriage before the age of 18, protect girls from sexual abuse, protects women against gender-based violence and protects the rights of the husband and wife to decide freely on the number and spacing of children.
  - Egypt has population and health strategies and programs with strong family planning component and access to RH services.
- On the international level, Egypt has confirmed its commitments to the key international obligations relevant to SRH and SRHR.
- However, Egypt is faced with non-favorable culture beliefs and gender norms, which often hinder the apt translation of the national discourse and efforts into SRH gains.
- Some aspects of the life course perspective of sexual and reproductive are missed and receive scant attention. These include puberty, consanguineous marriage, infertility, reproductive cancers and menopause.

1.2.1 National Commitments and Efforts

The 2014 Constitution clearly articulated the country's obligation to protect human rights in general and health in particular for all citizens without discrimination. Article 18 of the 2014 Constitution explicitly recognizes citizens' right to health, particularly women and children, and commits to providing access to integrated quality healthcare services.

Under the 2014 Constitution, the Ministry of Health and Population (MOHP) is responsible for the health of all Egyptian citizens, meaning that it works to improve all citizens' health without discrimination, in particular maternal and child health, infant health and the health of the disabled. It sets a measurable target for health sector investment to increase governmental health expenditure to at least 3% of the GDP. Furthermore, the MOHP exerts enormous efforts to introduce and enforce a new health insurance law to cover all Egyptians without discrimination.

Main legislations, strategies and programs supporting SRH

The 2014 Constitutional commitment to SRH is reflected in the country's laws and strategies. Egypt laws are based on the Islamic law (Sharia) and follow the French civil code. Egypt has done prominent reforms in the laws and has launched new strategies. A review of the pertinent laws and strategies reveals that many of them are favorable efforts to improve SRH (Box 1). The following subsections offer a review of the key themes in Egypt regulatory framework related to SRH.

Box 1: Summary of the key themes in Egypt regulatory framework related to sexual and reproductive health

Theme	Summary of women's rights
Social, economic and political protection	• Independent legal, economic and spiritual identify for both men and women • Right to pass nationality to children for both men and women • Right to education and work for both men and women • Increased women's participation in the formal and informal economy • Women's right to separate financial assets and their right to own property and land • Increased the percentage of political participation in parliament by 15% • Integrated the gender perspective in national plans program • Women's right to financial compensation and child custody in case of divorce
Marriage	• Prohibits marriage before the age of 18 • Right to choose the husband, divorce for harm and dissolve marriage • Discourages and protects girls from seasonal/temporary marriage to provide sexual services
Gender-based violence	• Female genital mutilation/cutting is criminalized • A woman can file a criminal case against her husband in case of marital physical violence and claim divorce for harm • Sexual harassment and rape are illegal and criminalized • Human trafficking is criminalized
Reproductive health and rights	• Protects the right of the husband and wife to decide on the number and spacing of children • No policies that discriminate against large families. • Access to wide range of family planning methods, antenatal care, skilled birth attendance, outreach post-partum visits • Compulsory vaccination of all newborns against tuberculosis, diphtheria, tetanus, polio, measles and hepatitis B viral infection • Maternity leave for three months, an hour of breasting for one year, unpaid leave for two years, nurseries for children of working mothers, and prohibits the dismissal of a female worker from service because of pregnancy, maternity or marital status • Abortion is illegal but can be allowed for medical reason to save the mother's live and protect against congenital malformations • Obligatory birth and death registration, mother cannot register birth of newborn in absence of husband and maternal death is reported through maternal surveillance system and safe motherhood committees

General Social, Economic and Political Protection Regulations and efforts

Some of these regulation and efforts pertain to both women and men but others were formulated to protect women's right and addresses any gender-based discrimination on different dimensions.

The Egyptian Constitution and personal status law protects women and men's rights in general. In accordance with the provisions of the Civil Code and related laws, all Egyptians, male and female alike, enjoy civil rights in conformity with the legally established provisions relating to capacity. There is no discrimination and there is no restriction that apply to women but not to men. Both men and women have independent citizenship status. Thus, women and men in Egypt have independent identity. They carry their father's name all over their life even if they get married and have separate legal, economic and spiritual identity after the age of 21. In 2008, the nationality law has been amended to allow both men and women to pass their nationality on to their children.

The regulations in Egypt aspires to provide social, financial and political security to women and men. On the social dimension, women and men have the right to education and work throughout the life-course, even for women after marriage and childbearing. Nevertheless, with the aim of protecting women's right and addressing any gender-based discrimination, many regulations and efforts were set or amended.

On the economic protection dimension, Law No. 137 of 1981 and Law No. 97 of 1959, Art. 130, concerning the Labor Code prohibits the employment of women in jobs that could damage their health or morals. Furthermore, article 174 provides penalties for any infringement of the provisions regarding the employment of women[a]. Furthermore, efforts were exerted to eliminate discrimination against women in employment (appointment, wages, benefits, etc.), enhance women right to a proper job and their equal status with men in employment and wages - Articles of the Constitution of 2014, Civil Service Act 2016, in addition to, formation of Equal Opportunities Units in various ministries since 2003. These efforts, according to the National Population Council, were translated in increased women's participation in the formal and informal economy through women's development programs and women's access to income-generating projects.

On the financial protection, Egypt has legislated women's right to separate financial assets and their right to own property and land - the law of ownership and tenure of land. In December 2017, the Egyptian Parliament approved the amendments to the Inheritance Law 77/1943, imposing strict sanctions on those who disinherit members of a family, particularly women, from receiving their rightful shares. Furthermore, in case of divorce, the women has the right to get a financial compensation for herself and her children, to keep marital home until the end of children custody (15 years for both girls and boys) and she has the right to choose the children schooling.

On the effort level, in 2014, the Ministry of Social Solidarity introduced a national cash transfer program that provides monthly transfers to women in vulnerable families. Over 2 million families have received these transfers, resulting in an important protective impact on beneficiaries. Recently, the programme has been expanded to offer cash transfers to young pregnant women who have one or no children, with the specific aim of reducing fertility.

Furthermore, the parliament recently approved a new health insurance law to ensure universal healthcare coverage of all Egyptians without discrimination. However, the mechanisms of implementation are still underway.

On the political dimension, Egypt increased women political participation in parliament by 15% and political life engagement through the political rehabilitation program, and developed integrating the gender perspective in national plans program during the first quarter of 2017. Egypt has increased the representation of women and girls in cultural life away from any form of discrimination through "our future in our hands - empowering young people" program.

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[a] This report was provided by Egypt government in response to a questionnaire as part of a review of implementation of ICPD Cairo Declaration. The review was implemented by ESCWA, UNFPA/ASRO, LAS with technical support from SRC/AUC

Marriage

Egypt has strong commitment to protecting young girls against early marriage. Article 80 of the Constitution affirms that the state is obliged to provide children with care and protection from "all forms of violence, abuse, mistreatment, and commercial and sexual exploitation". The 2008 Child Law prohibits the marriage of girls before the age of 18. It stresses the protection of the child from underage marriage, which is considered a form of sexual exploitation. In addition, Egypt Law No. 103 of 1976 also known as the new tourism marriage law was enacted to discourage and protect young girls from seasonal/temporary marriage (young women and girls particularly from poor families are married off to rich non-Egyptian men to provide sexual service). The law requires documentation of marriage contracts, requiring a foreign man to present a certificate from his country's embassy stating that there are no impediments to the effecting marriage, a deposit is also made in the girl's name, as security for her when she is 25 years or more younger than him. However, in practice, this law is largely ineffective as an arbitrary number of seasonal/temporary marriages between Egyptian women and non-Egyptian men continue to take place as way to secure money. Recently, the National Population Council has propelled a strategy to reduce early marriage and provide social and health support to young married girls.

Even after marriage, under the Personal Status Law, a woman has the right to choose her husband and marries with her own will and no one, even her father or mother, has the right to force her into marriage. If the woman does not consent, the marriage is renounced. The marriage is done through a legal marriage contract, which allows the bride and the groom to add special conditions if they want. The divorce decision by default is in the husband's hands, yet the marriage contract allows the husband to delegate his wife the right to repudiate herself.

A woman has the right to claim divorce for fear of harm. Egypt's personal status law in 2000 has granted woman the right to claim "Khula" (dissolve the marriage). In case of Khula, the wife gives up all her financial rights and may even offer a financial compensation to her husband.

Polygamy is not legally banned. Men can marry four wives at one time. Nevertheless, the Personal Status Law protected women against polygamy through setting a standard marriage contract that gave women the right to stipulate conditions, such as the right to divorce in the event of a husband's contracting a second marriage, and requesting the current wife written approval in case the husband wants to conclude subsequent marriages. Further reforms in 2005 also included the establishment of family courts, the creation of a Family Fund for court-ordered alimony and maintenance for female disputants, and new child custody laws.

However, the traditions, gender norms and financial constraints render these laws ineffective[4, 5]. Regarding obtaining marriage consents, girls cannot disobey their father and family and find hard to report this. In addition, women continues to be reluctant to claim 'isma,' raise legal cases for divorce or even ask for "Khula". Furthermore, poor women cannot handle the financial burden of living on their own or paying for the court fees.

Gender-based violence

Egypt is committed to the right to be free from sexual and gender-based violence. Egypt has made significant progress on the issue of female genital mutilation/cutting (FGM/C). The amendment in 2016 of the Law No. 58 of 1937 and Law No. 126 of 2008 criminalizes FGM/C. The Egyptian Dar al-Ifta, the official religious institution responsible for issuing religious decrees regulating Muslim Egyptians' daily life, stated that FGM/C is a cultural phenomenon and is not religious act [4,6]. However, FGM/C persists in Egypt, as there is a sustained belief that it is justified by religious principles, and is practiced among both Muslims and Copts as means to protect girls' chastity and provide them with better marriage opportunity[6].

According to the National Population Council, Egypt has recently developed strategies to combat violence against women, 2015-2020, FGM, and a strategy to support women affairs. Egypt has been implementing training courses for gender-based violence prevention programs, including data collection and analysis for policy makers and evidence-based advocacy programs to follow up the implementation of the violence against women strategy at the level of ministries and governorates. Egypt has taken measures and laws to ensure that women and victims of violence receive protection, health and psychological care, and transfer to the competent authorities, including health, justice and police, through the National Strategy for the Prevention of FGM/C

Furthermore, marital violence is considered a criminal offense and the wife beaten by her husband can file a criminal case against him[5]. Marital violence is also a ground for divorce and the wife is able to file a divorce action for harm. However, marital violence persists; it is justified by the masculine superiority and the false belief that it is a religious right for the husband to discipline his wife. However, few women are reluctant to file such actions because of the culture sensitivity and social stigma coupled with the financial burden. In addition, in 2014, Egypt issued the sexual harassment law to protect women against rape. Most cases remain unreported because women and their families are reluctant to report such cases given the sensitivity and the serious stigma around the issue.

Egypt also, issued the law against human trafficking in 2010 to criminalize all forms of trafficking in persons for labor and sexual exploitation and to provide for legal protection for victims of trafficking and respect for their rights. However, Egypt continues to face serious challenges, since the phenomenon is not well understood due to the absence of accurate data. In addition, there is a general lack of awareness and knowledge in the country with regard to trafficking in persons [4-6].

Reproductive health

The country protects the right of the husband and wife to decide on the number and spacing of children. Despite the high population growth rate, Egypt has no policies that discriminate against large families. In the past, Egypt had distinct strong family planning component in the population and reproductive health strategies. The first National Population Policy in 1973 adopted the goal of reducing the crude birth rate from 34 to 24 births per 1,000 by 1982. The policy acknowledged socioeconomic development and the provision of family planning services as essential to reducing

fertility. After the landmark ICPD1994, there were attempts to merge family planning with maternal and child health under the MOHP. The attempts embraced a comprehensive approach, integrating family planning, maternal, and child health focusing on quality of care and encouraging appropriate care-seeking behavior, but this merge did not happen.

Since then, Egypt is highly committed to ensuring access to a wide range of family planning methods for all married couples [2,7]. National programs were developed to provide family planning services- with financial support- to all groups in deprived areas, and introduce more effective and long-lasting means.

More recently, a National Strategy for Reproductive Health 2015-2030 was established to support the right of an improved reproductive health to all citizens. Women's access to comprehensive non-discriminant reproductive and sexual health services, regardless of family status or age, were significantly increased, in addition to, access to health care during pregnancy, natal and postnatal care. Adolescents and youth's access to reproductive and sexual health services were also promoted

On the effort side, the country has an integrated maternity health care package with antenatal care, including immunization against tetanus, supplementation with vitamin A, folic acid and iron, as well as delivery care in the hands of skilled providers and outreach post-partum visits. In addition, HIV prevention and treatment, as well as safe abortion were integrated into the SRH services. For newborns, Egypt has adopted a compulsory Expanded Programme of Immunization (EPI) in accordance with criteria of the World Health Organization (WHO), involving vaccination against tuberculosis, diphtheria, tetanus, polio, measles and hepatitis B viral (HBV) infection. The success of the vaccination program was crowned by the marked reduction in HBV prevalence and the WHO declaring Egypt free of neonatal tetanus in 2006.

In addition, Egypt's labor law provides mothers a maternity leave for three months, an hour of breasting for one year and the right to raise children for a period of two years without pay. In addition, the Law No. 137 of 1981 and Law No. 97 of 1959, Art. 130, requires any employer of more than 100 women to set up or share the cost of providing a nursery. The law prohibits the dismissal of a female worker from service because of pregnancy or during maternity leave or on the basis of her marital status.

Abortion is illegal according to the Egyptian Penal Code of 1937. Both pregnant women and healthcare professionals involved in the abortion procedure are subject to imprisonment. Nevertheless, the induced abortion can be allowed in exceptional circumstances[8]. The code of ethics of the medical profession stipulates that doctors be allowed to perform abortion for medical reasons threatening a woman's life or preventing congenital malformation, if they receive a written approval from two other specialist physicians. Despite these restrictions, research speaks about secretly unjustified provoked abortions with no official estimates[9].

A last note to mention is that the civil system in Egypt mandate the birth and death registration. However, for the birth registration, a mother cannot register the birth/death of her child without the presence of the father. For the maternal death, documentation and investigation of cases are done through a national maternal mortality surveillance system and safe motherhood committees existing in all governorates.

I.2.2 International Obligations

Egypt has confirmed commitment to the key international obligations relevant to SRH. Box 2 compiles the list of the Egypt's international commitments. The list may not be exhaustive but is intended to reflect Egypt's assertiveness on fulfilling the SRH goals.

Since 1948, Egypt is part of the universal system of human rights to affirm people's freedom and right to a dignified healthy life without any form of discrimination. For example, the main landmarks ratified by the country include the Universal Declaration of Human Rights (1948); the International Covenant on Economic, Social and Cultural Rights (1966); the Convention on the Elimination of All Forms of Discrimination against Women- CEDAW- (1979), the Convention on the Rights of the Child (1989) and Cairo Declaration on Human Rights in Islam (1990).

Egypt is committed to ensure health and equity in health with special emphasis on SRH. Egypt is signatory to the WHO Constitution (1948) and the Alma Atta Declaration (1978). In 1994, Egypt hosted the ICPD and committed to its plan of action (PoA), which gave significant attention to women's SRH. Egypt is committed to the Ottawa Charter for Health Promotion (1986), Jakarta Declaration on Leading Health Promotion into the 21st Century (1997), the Declaration of Commitment on HIV/AIDS (2001), the Rio Declaration on Social Determinants of Health (2011), the MDGs (2000), and the SDGs (2015). All these stipulate the role of women in development with gender equality and SRH as key goals.

In 2013, the ICPD Beyond 2014 was held in Cairo. Egypt endorsed the findings and conclusions of the Arab regional review on the implementation of the ICPD's PoA, as well as its key activities and follow-up beyond 2014.   Egypt also confirmed consensus on the principles included in the Cairo PoA related to the sovereign right of the state in implementing the recommendations in accordance with national laws, with full respect of various religious and moral values and the cultural background of the people, and in accordance with internationally recognized human rights.

Box 2 List of major Egypt international obligations pertinent to sexual and reproductive health

Agreements	Adopted	Came into force
Universal Declaration of Human Rights	1948	
WHO Constitution	1948	
Convention on the Elimination of All Forms of Racial Discrimination	1965	1969
The International Covenant on Economic, Social and Cultural Rights (ICESCR)	1966	1976
Covenant on Civil and Political Rights	1966	1976
Declaration of Alma-Ata on Primary Health Care	1978	
The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)	1979	1981
The Ottawa Charter for Health Promotion	1986	
Declaration of the Right to Development	1986	
The Convention on the Rights of the Child (CRC)	1989	1990
The International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families	1990	2003
Cairo Declaration on Human Rights in Islam	1990	
Rio Declaration on Environment and Development	1992	
The International Conference on Population and Development (ICPD) Program of Action (PoA)	1994	
Jakarta Declaration on Leading Health Promotion into the 21st Century	1997	
Millennium Declaration	2000	
Declaration of Commitment on HIV/AIDS	2001	
Convention on the Rights of Persons with Disabilities	2006	2008
World Health Assembly Resolution Reducing: Health Inequities Through Action on the Social Determinants of Health	2009	
International Conference on Population and Development Programme of Action	2010	
Rio Political Declaration on Social Determinants of Health	2011	
Global Conference on Health Promotion	2013	
Regional Conference on Population and Development in the Arab States 2014: Cairo Declaration	2013	
Sustainable Development Goals	2015	

Sources: United Nations Treaty Collection (https://treaties.un.org/), University of Minnesota Library for Human Rights (http://www1.umn.edu/humanrts/), Arab Commission for Human Rights (http://www.lasportal.org/wps/portal/las_ar_humanrights/)

I.3. Insufficiently Addressed Sexual and Reproductive Health Issues

SRH is a life course trajectory. Looking at SRH from birth to death denotes several issues that receive insufficient attention some of which may be key in improving the life of people. These concerns have social, economic, and physical dimensions as well as health system facets that are highly interlinked. Below are some of these concerns (Box 3). The following is a review of some of these issues:

Puberty

Puberty is the starting benchmark in young adolescents SRH. The lives of young adolescents from 10 to 14 years of age are characterized by profound biological, cognitive, emotional and social changes associated with the passage through puberty. These formative years offer an ideal window of opportunity for building the foundations of SRH among young adolescents[10].

It is worth noting that Egypt has strategies on youth and special bodies to tackle youth issues. A national policy for youth in Egypt was launched in 2009, covering twelve areas related to youth, including health and awareness activities[4]. Egypt was one of the first countries to conduct a major national survey on young people in the 1990s and a revised and expanded survey in 2010. In recent years, largely funded by external support, there has been a number of initiatives led by UNFPA and others to initiate youth-friendly services in some Arab countries including Egypt. However, these services are generally small in scale, not well-advertised and are not national in scope [4,9]. Till present, there are no nationwide healthcare services to monitor the adolescents' growth and development. There is no scientific evidence on the biological, cognitive, emotional and social needs during puberty for both girls and boys.

Despite the fact that the ICPD's PoA recommended that countries provide scientifically accurate and comprehensive sexuality education programs within and outside of schools that include information on contraceptive use and acquisition, implementation of this recommendation is not up to the standard in Egypt. The content of the sexuality education programs (including information on reproductive rights, responsible sexual behavior, SRH, prevention of sexually transmitted infections including HIV/AIDS, prevention of teenage pregnancy, and family planning) is culturally sensitive in the country. Furthermore, there are hardly counseling services to guide adolescents and their families make safe, informed and voluntary SRH decisions.

Consanguineous marriages

In Egypt, sexual activity is only condoned through marriage. The normative practice of consanguineous marriage is introduced as means for girls' protection and a way for upholding the familial assets. Given the ease of marital arrangements, consanguineous marriages are usually associated with early age at marriage and early childbearing [11].

Multiple studies have established consanguinity as a high cause for stillbirth and birth defects and abnormalities [11-13]. It is estimated that about 3 million fetuses and infants are born each year with major malformations [14,15]. Several large population based studies place the incidence of major malformations at about 2–3% of all livebirths [16].

There is hardly evidence on the magnitude of the congenital disorders in Egypt. However, it is evident that congenital disorders contributes to infant mortality, as about 15% of all infant deaths are due to birth defects[17]. A recent study in Egypt showed that 4.3% of children from birth to 18years were proved to have genetic disorders with neurologic disorders (31.4%), hematologic disorders (18.5%) and chromosomal abnormalities (11.5%) as the most common genetic diseases[18].

Egypt has no strategy to reduce consanguineous marriage. Though Egypt has made premarital screening a legal requirement for marriage to limit genetic diseases and malformations, the screening is reduced to physical examination and vital signs and is not accompanied by genetic counseling notably for consanguineous marriages or whenever genetic diseases are widespread in a family.

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Furthermore, Egypt does not have registers for genetic disorders to monitor the magnitude of the problem and the underlying causes.

Infertility:

Childbearing is the anticipated joyful event of sexual activity and marriage. The failure to have children is a major crisis for most couples, with both partners experiencing loss in ways that affect them as individuals, as family members and as members of society as a whole. Infertility generally refers to a failure of a woman to become pregnant after one year of regular, unprotected intercourse. This is a proxy measure since this may simply refers to delayed conception.

Infertility has many potential causes, which may involve the man, the woman or both partners. In some cases unexplained. Of the causes that are known, the most common among women are irregular ovulation, endometriosis and blockage of the fallopian tubes. Among men, the most common cause is a sperm disorder. While men and women are equally likely to be infertile, women are often blamed. An inability to conceive or bear children can result in women being socially detested or divorced, and may have economic, mental or other health implications.

Infertility in Egypt is an understudied concern. There is no information on the magnitude of infertility in the country and its underlying causes. However, there is some mention that Egypt hosts over 50 in-vitro fertilization (IVF) clinics [19]. Infertility care is not part of the services of reproductive health divisions in MOHP despite the known links between reproductive tract infections and subsequent infertility. Services for IVF are mostly available in the private sector and in the big cities and thus only for couples who can afford treatment. Furthermore, the most up-to-date technologies are still not regulated example, the types of infertility treatments allowed, the number of embryos that can legally be implanted and the sex selection.

Reproductive cancers

Throughout the sexual and reproductive life, women and men may suffer from several diseases in the reproductive organs. The most noxious are reproductive cancers. In women, these are cancers in the breast, cervix, uterus, vulva, endometrium or ovaries. Despite the fact that reproductive cancers are gaining importance worldwide, they are not included in the SRH strategies or package of services in Egypt. Thus, screening for reproductive cancers is still of low priority and practiced at a limited scale notably in the public sector.

Cervical cancer is one of the most preventable of all cancers. It is caused by certain types of the human papilloma virus (HPV). In Egypt, insufficient attention has been given to making the HPV vaccine widely available. Although HPV vaccination is now recommended in the United Kingdom, the United States, and Canada, as well as other countries, Egypt, typically does not subsidize this vaccine or undertake public health campaigns to encourage its uptake.

Box 3: Insufficiently Addressed Sexual and reproductive health issues

Issue	Gaps
Puberty	• No information on adolescents biological, cognitive, emotional and social needs • No healthcare services to monitor young adolescents' growth and development • No counseling services to guide adolescents and their families make safe, informed and voluntary sexual and reproductive health decisions • Social barriers to sexuality education
Consanguineous marriage	• No counseling services to reduce risky consanguineous marriages • Premarital screening is not accompanied by genetic counseling • No registries for congenital malformations • No evidence on magnitude and trend of congenital disorders
Infertility	• No evidence on magnitude and trend • No evidence on magnitude of infertility treatment • No regulations to organize in-vitro fertilization
Reproductive cancers	• Reproductive cancers are not included in the sexual and reproductive health package of services • Screening for reproductive cancers is still of low priority • The human papilloma virus vaccine is not subsidized and there are no campaigns to encourage its uptake
Sexually transmitted diseases	• The premarital counseling is not accompanied by screening for sexually transmitted infections, hepatitis B viral infection and HIV/AIDS • The premarital counseling lacks information and education about the prevention of diseases transmitted by sexual route • HBV infection is not recognized as a sexually transmitted disease and there is hardly awareness campaigns to prevent its spread through the sexual route • There is a national AIDS program, a multi-sectoral AIDS strategy, and commitment to achieve the Three Zeros by 2030, however, there are many culture and legal barriers to optimizing HIV prevention and treatment • The antiretroviral therapy is provided free of charge, but is insufficient to cover all HIV/AIDS cases • People living with HIV, notably women, are reluctant to access HIV/AIDS and STIs services due to shame or embarrassment of disclosure of sexual activity
Menopause	• Women's needs during menopause and beyond the reproductive age is minimally addressed in services, programs, and public education • Menopause is not referred to in the sexual and reproductive health strategy. • Menopause is not significantly researched and there are apparently many social and cultural barriers for post-menopausal services

Sexually transmitted diseases

Sexually transmitted diseases (STDs) including HIV/AIDs are a second package of harmful infectious during the sexual life. In Egypt, several efforts exist to halt such infections. For example, Egypt has a special national AIDS program (NAP) and has drafted a multi-sectoral AIDS strategy with strong involvement of civil society. Egypt has joined the World AIDS Campaign in 2014 to achieve the Three Zeros by 2030: Zero new HIV infections, Zero AIDS related deaths and Zero Stigma and Discrimination. However, many legal barriers and social stigma remain to optimizing HIV prevention and treatment. HIV/AIDS cases exist in the country, yet little is known about the prevalence of the infection and the incidence of new cases. The country provides antiretroviral therapy for free, yet the amount is insufficient. People living with HIV, notably women, are reluctant to access HIV/AIDS and STIs services due to shame or embarrassment of disclosure of sexual activity.

Furthermore, the MOHP makes great efforts to curb the spread of HBV infection. Since the 1990s, Egypt has introduced HBV vaccination in the EPI. However, HBV infection is not recognized as STD and there is hardly awareness campaigns to prevent its spread through the sexual route.

Though Egypt has a premarital counseling strategy to halt the spread of genetic and communicable diseases notably those transmitted by sexual route, the premarital counseling is not accompanied by screening for STIs, HIV/AIDS and HBV. It also lacks counseling and education about the transmission and the prevention of diseases transmitted by sexual route.

Menopause

Menopause is not a disease. It is a physiological "Change of Life," that transforms a woman's life. Women's SRH during menopause and beyond the reproductive health age require special attention. The vast majority of women experience negative physical, emotional and social impact. The menopause is accompanied by a decrease in hormone production by the ovaries, which can lead to hot flushes, mood swings, anxiety, irritability, feeling of sadness, difficulties with memory and concentration, and even depression. Women have an increased risk of developing significant depressive symptoms after they enter menopause, even if they do not have a history of depression. The term used socially for menopause in Arabic is '*age of despair*' reflecting the value placed on women's reproductive roles. Menopausal support and care are another concerns not referred to in Egypt SRH strategy.

Part Two: Framework and Methodology[b]

The adopted framework uses the conceptual framework of the Commission on the Social Determinants of Health (CSDH) [20] as its point of departure. In the conceptual framework of CSDH, the concept of Social Determinants of Health cover the full set of social conditions in which people are born, grow, live, work and age. These are the contextual forces referred to as proximate determinants of health. According to the framework, pervasive and persisting health inequalities can be linked to the unequal distribution of these conditions, which are the product of the wider social, economic, political, environmental and cultural systems and structures. Such systems and structures are the structural determinants referred to by CSDH as "the causes of the causes". The framework also includes intermediary public services and actions that can contribute to the observed SRH inequalities, as well as play a role in preventing and ameliorating them.

The first step in the analysis was to adapt the framework to make it more relevant to the current investigation of SRH. The second step was to operationalize the framework through a set of practical currently available indicators and stratifiers. Following these steps, the analysis used an appropriate methodology to allow investigating SRH challenges and to contribute to an evidence based diagnosis of contextual and structural determinants of inequalities.

A summary discussion of the key steps of the current investigation is provided in the following:

II.1 The Framework for SRH Inequality Investigation

The framework adopted in the analysis is presented in Figure 1. The framework describes the conceptual thinking explaining the relationships and pathways through which social determinants influence sexual and reproductive health and their distribution across the various social groups in the population.

The CSDH moves the emphasis from investigating and assessing the proximate determinants to stressing the importance of the structural determinants that influence the individual social stratification. While previous efforts were commonly confined to assessing the impact of the proximate social determinants, the current adjustment trace inequalities to their structural causes framing the social stratification and defining the individual social position which in turn shapes these proximate determinants. This emphasis moves the policy discourse from its usual sole focus on changing risky behavior and on improving general socioeconomic conditions to recognizing the need to address structural determinant with its own pathway of influence.

The adaptation is described in the following:

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[b] The "Framework and Methodology" chapter is a standard in all five national reports. It was presented and discussed in a workshop organized by SRC project team and held in Cairo during April 2018.

Figure 1: Social Determinants of Health Equity Framework
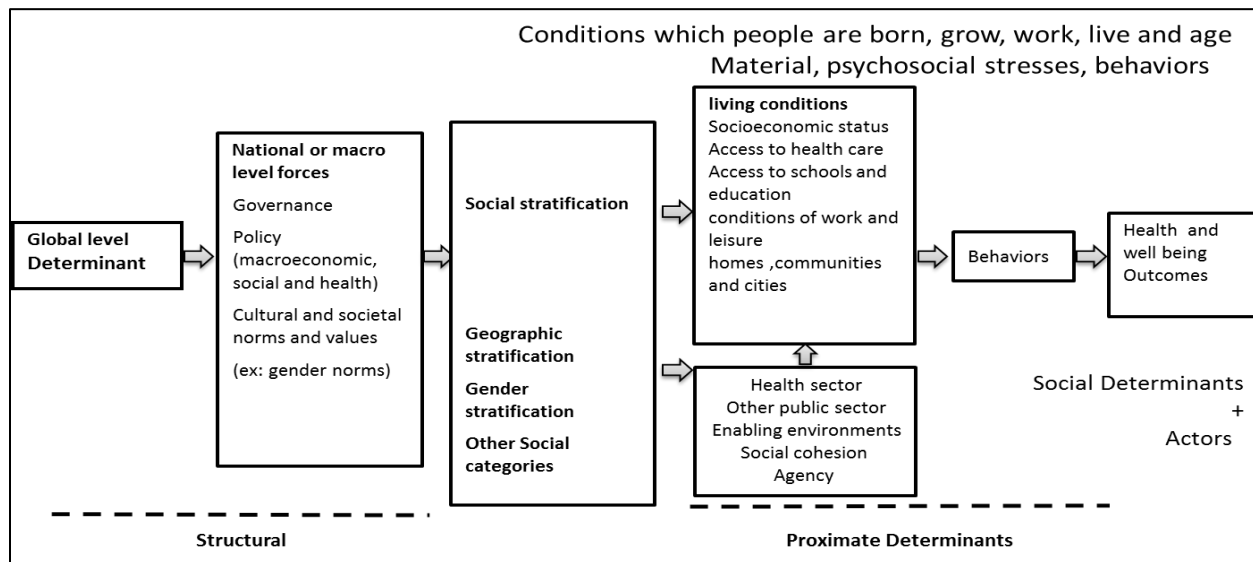
II.1.1. Introducing the Distribution of Gender Norms as a Social Stratifier of SRH Inequalities.

Gender norms are defined as the ideational and cultural attitudes that manifest themselves in environmental and behavioral forces impacting sexual and reproductive health. These norms are social constructs that shape central SRH determinants such as definition of gender roles and different sets of rights and responsibilities by sex. Gender norms manifest themselves in a community and family level environment that provide differentiated access to health resources and opportunities, as well as in risky SRH behaviors (such as traditional harmful practices, childhood and forced marriages, unhealthy reproductive patterns, violence against women,...).

Despite the importance of gender norms in shaping SRH, the current evidence base on social determinants of SRH does not pay adequate attention to this component. It is true that many analytical pieces acknowledge that risky gendered behaviors are detrimental to SRH, yet the SRH literature remain quite silent in terms of measuring gender norms and their distribution , as well as in linking such a distribution to the unequal distribution of SRH outcome measures.

The benefits of introducing gender norms and its distribution in the analysis include:

- Emphasizing gender norms as a central determinant with significant influence on SRH. This emphasis moves the policy discourse from its usual sole focus on changing risky gender behavior and on improving general socioeconomic conditions to recognizing the need to address gender norm as a contextual determinant with its own pathway of influence.
- Operationalizing the measurement of the distribution of gender norms and highlighting the needed data to adequately capture this important social determinant.

- Producing needed evidence that link the distribution of gender norms to the distribution of SRH outcome measures. Such evidence describing distributional aspect of gender norm is totally missing in the literature.
- Assessing the relative contribution of the distribution of gender norms vis a vis the distribution of other social determinants (such as the health system, socioeconomic conditions, area level characteristics) in producing unequal SRH health outcomes for specific social groupings. This assessment was performed using a decomposition analysis.

The significance of these benefits is particularly noted in allowing gender policy recommendations that are evidence based. Such policy recommendations will be highlighted in a separate regional policy report.

II.1.2 Thorough incorporation of the Fairness of Health Care System and its Relative Contribution as a Social Stratifier of SRH inequality

The health care system is an important social determinant of health that lends itself readily to health sector interventions. Hence it was decided to devote a separate section dealing with the health care system.

The analysis investigated the fairness of the distribution of the components of health care system within the three common social stratifiers of area, wealth and gender. The four domains covered in the WHO Operational HSS[21] Monitoring Framework were used to monitor the HS capacity and performance as SDH influencing the SRH and their uneven distributions (Figure 2). The framework brings together indicators and data sources across the results chain and its entirety and composes four major indicator domains: 1) System inputs and processes, 2) outputs, 3) outcomes, and 4) impact. System inputs and processes reflect HS capacity. Outputs, outcomes, and impact are the results of investment and reflect performance. Monitoring of HS performance needs to show how inputs to the system (resources, infrastructure, etc) are reflected in outputs (such as availability of services and interventions) and eventual outcomes and impact including use of services and better health status.

Furthermore, similar to gender norms, a decomposition analysis was performed to assess the relative contribution of health care system distribution in producing SRH inequalities.

Figure 2: Monitoring and evaluation of health systems strengthening[21]
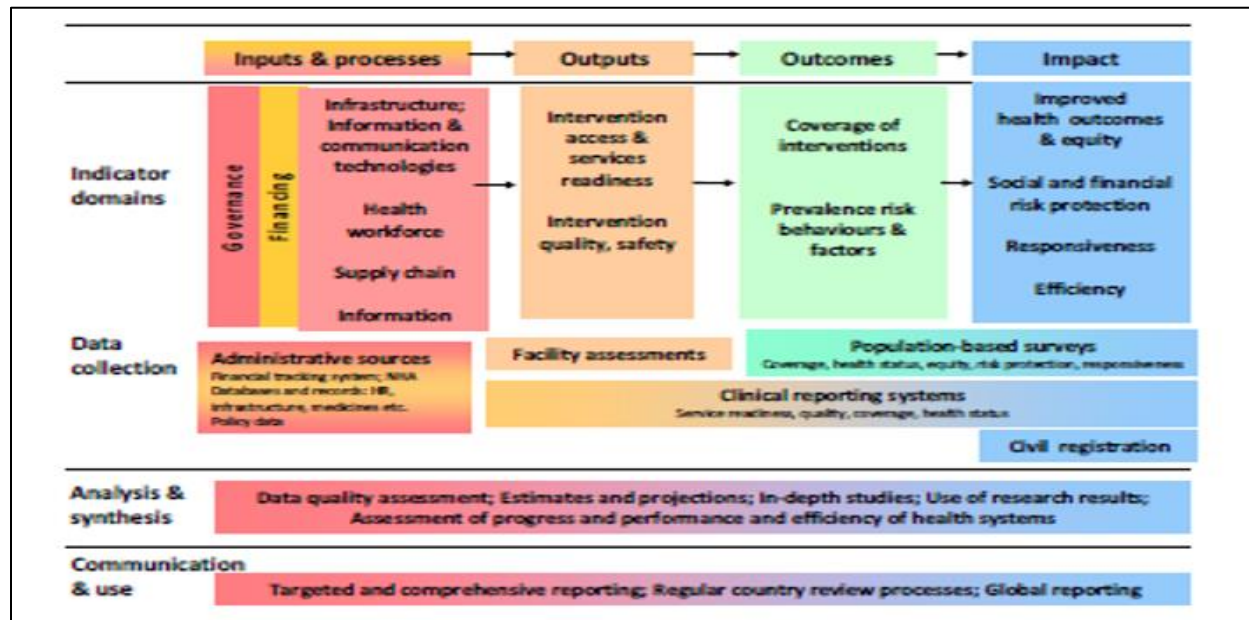
II.2. Operationalizing Sexual and Reproductive Health Inequality Framework

II.2.1. Sexual and Reproductive Health Indicators

The operationalization of the framework requires choosing the dimensions to reflect each component of the framework that are contextually relevant. It also requires specifying the indicators of SRH and assembling the available ones, as well as the choosing the appropriate stratifiers.

To guide such operationalization, a thorough literature search based on peer-reviewed and grey literature, policy documents, program evaluations and sector strategies and plans, as well as a review of the quantitative data from population-based surveys, routine data systems, international databases and other sources was carried out. The purpose of the literature review was to capture the landscape of SRH challenges globally and in the Arab region with emphasis on SRH inequities and the specific population groups who are disproportionately impacted by poor health outcomes. In addition, the review, also, focused on identifying the indicators and social stratification commonly used for monitoring SRH inequalities.

A shared folder organizing a good number of relevant pieces of literature was a byproduct of this review effort and can be accessed through https://drive.google.com/drive/folders/1Ca6H75DixECNXcNqkc19VqZnJIrkw5tE

There were 57 SRH-related indicators. Annexes 1-3 compile the list of SRH-related indicators. The indicators were classified according to the operational framework into three domains:

- The first includes the SRH impact indicators, which reflect the overall impact of the "whole-of-government" achievement, living environment and HS influence on SRH. Twelve SRH impact indicators (Annex 1) were identified. The internationally commonly used SRH impact indicators include:
    - SRH-related mortality indicators: Five indicators were defined to measure perinatal mortality, neonatal mortality, infant mortality, maternal mortality and mortality attributed to cancer (breast, cervical).
    - SRH-related morbidity indicators: Seven indicators were identified to measure prevalence of infertility, incidence and prevalence of HIV infection, incidence of hepatitis B viral (HBV) infection and prevalence of urethritis. The commonly used list does not include STIs and congenital anomalies.
- The second includes the risk factors (outcomes) which reflect the national level forces including, governance, policies, culture and gender norms, as well as HS challenges translated into gender manifestations, risk behaviors or even biological outcomes in certain social subgroups. There were 12 defined indicators (Annex 2). They represent individual risk factors and are classified into:
    - Social and psychological risk factors: these are measured by nine indicators to identify negative SRH experience as early age at marriage, FGM/C and gender-based violence (GBV). The indicators miss many context specific social manifestations such as age, social and psychological needs at puberty and menopause; consanguineous marriages; multiparity; and risky birth interval
    - Biological risk factors: there were 3 indicators to identify biological risk factors including anemia in reproductive age, anemia in pregnant women and low birthweight. This indicators miss pregnancy-related diseases such as endometriosis, gestational diabetes, eclampsia, prematurity,....
- The third includes the HS determinants, which reflect the negative influence of the health policies, and most importantly trace the negative impact of the package of public policies on the HS capacity and performance, such as national financial policies, the education policies, the development policies, …. They include thirty three indicators (Annex 3) referring to:
    - Service capacity with fifteen HS inputs related to the HS six building blocks.
    - Service performance indicators using 18 indicators to describe process, access/demand, service use and HS outcome. The indicators miss delivery complications and postnatal care

Following the review, the assembly of SRH indicators and the stratifiers available in Egypt was carried out. Egypt is well endowed with ample data. Demographic and Health Survey (DHS) Series of Surveys started in Egypt since 1988 and the latest was in 2015. They are the only country systematic and periodic population-based data sources for a wide range of monitoring and impact evaluation indicators in the areas of population and health. Egyptian Demographic and Health Surveys (EDHS) are conducted on behalf of the Ministry of Health by El-Zanaty and Associates. They are part of the DHS Program funded by the United States Agency for International Development (USAID).

The tabulated and raw data of Egypt Demographic and Health Survey in 2014 (EDHS2014)[22] and Egypt Health Issues Survey in 2015 (EHIS2015)[23] cover 35 SRH-related indicators. The indicators

were further classified into the three domains (impact, risk factors and HS determinants). To allow for ranking indicators according to magnitude of challenge, all indicators express a negative aspect of health.

Box 4 provides the available SRH impact indicators in EDHS2014 and EHIS2015. The analysis does not include the maternal mortality ratio as it is not available in either surveys. In addition, the two surveys missed the morbidity indicators. However, EHIS2015 reported the prevalence of HBV infection, thus was used to replace HBV incidence on the indicator list Annex 1. The prevalence of HBV infection was stratified by sex for two age groups (1-14years and 15-59years) to assess the gender differences and the success of the vaccination coverage in halting the infection in both sexes. Furthermore, the prevalence of delayed primary fertility (> 2years) was used as a rough estimate of infertility in women and self-reported STIs were added as measure of the prevalence of STIs in women.

Box 4: Sexual and reproductive health impact indicators in Egypt

Indicator	Definition	Source
Mortality		
1. Neonatal mortality	Deaths during the neonatal period per thousand livebirths in the five years preceding the survey	EDHS2014
2. Infant mortality	Deaths before the age of 12months per thousand livebirths in the five years preceding the survey	EDHS2014
Morbidity		
3. Delayed primary fertility	Percent ever married women 15-49 years married for more than 2 years reporting having no children	EDHS2014
4. Prevalence of hepatitis B infection in males	Percent hepatitis B surface antigen (HBsAG) positive among 1-59years males	EHIS2015
5. Prevalence of hepatitis B infection in females	Percent hepatitis B surface antigen (HBsAG) positive among 1-59years females	EHIS2015
6. Prevalence of hepatitis B infection in boys (1-14years)	Percent hepatitis B surface antigen (HBsAG) positive among 1-14years boys	EHIS2015
7. Prevalence of hepatitis B infection in girls (1-14years)	Percent hepatitis B surface antigen (HBsAG) positive among 1-14years girls	EHIS2015
8. Prevalence of hepatitis B infection in men (15-59years)	Percent hepatitis B surface antigen (HBsAG) positive among 15-59years men	EHIS2015
9. Prevalence of hepatitis B infection in women (15-59years)	Percent hepatitis B surface antigen (HBsAG) positive among 15-59years women	EHIS2015
10. Prevalence of self-reported sexually transmitted infections (STIs) in women (15-49years)	Percent ever married women 15-49years who reported STIs or symptoms (abnormal genital discharge, genital sore/ulcer)	EDHS2014

Box 5 provides the list of risk factor (outcome) indicators available in EDHS2014 and EHIS2015. The data missed the information on GBV except for marital violence. Marital physical violence

during pregnancy was also added to reflect such practice. FGM/C was analyzed for two age groups (1-14years and 15-49years) to reflect the trend in such practice.

Furthermore, three more indicators were included, namely consanguinity, multiparity and risky birth interval. These indicators reflect some of the culture specific norms particularly in the area of gender and gender dynamics.

Box 5: Risk factor (outcome) indicators in Egypt

Indicator	Definition	Source
Psychological		
1. Female genital mutilation/cutting (FGM/C 1-14years)	Percent girls and women aged 1-14 years who have undergone FGC	EHIS2015
2. Female genital mutilation/cutting (FGM/C 15-49years)	Percent girls and women aged 15-49 years who have undergone FGC	EDHS2014
3. Consanguinity	Percent ever married women 15-49years related by marriage to their husbands (consanguinity)	EDHS2014
4. Early age at marriage	Percent of ever married women aged 15-49 years who were married before the age of 18years	EDHS2014
5. Adolescent childbearing	Percent women aged 15-19 who have begun childbearing	EDHS2014
6. Multiparity	Percent ever-married aged 15-49 years who have 5+ livebirths	EDHS2014
7. Risky birth interval	Percent non-first births in the five years preceding the survey born <24 months since preceding birth (risky birth interval)	EDHS2014
8. Marital violence	Percent ever-married (15-49years) women who have ever experienced physical, sexual or psychological violence by their husband	EDHS2014
9. Marital physical violence during pregnancy	Percent ever-pregnant women (15-49years) who experienced physical violence during pregnancy by their husband	EDHS2014
Biological		
10. Anemia in reproductive age	Anemia among women of reproductive age (NP: Hg<11.0g/dl, P:< 12.0g/dl)	EDHS2014
11. Low birth weight (LBW)	Low birth weight among newborns (<2.5kg)	EDHS2014

Box 6 provides the list of analyzed HS indicators in EDHS2014 and EHIS2015. As HS inputs defined in the list of indicators (Annex 3) were not available in the data sets, six indicators in EDHS2014 were used to measure the HS capacity in responding to SRH needs. Furthermore, two additional indicators were available in the data sets and were used to reflect the lack of postnatal care and breast cancer screening.

Box 6: Health system indicators in EDHS2014 and EHIS2015.

Indicator	Definition	Source
Health system capacity		
1. Far distance to healthcare facility	Percent women aged 15-49years who reported serious problems concerning far distance to healthcare facility	EDHS2014
2. Difficult transportation	Percent women aged 15-49years who reported serious problems concerning having to take transportation to reach health care facility	EDHS2014
3. Unavailable female provider	Percent women aged 15-49years who reported serious problems concerning unavailable female provider	EDHS2014
4. Unavailable provider	Percent women aged 15-49years who reported serious problems concerning unavailable provider	EDHS2014
5. Unavailable medication	Percent women aged 15-49years who reported serious problems concerning unavailable medication	EDHS2014
6. Unaffordable healthcare services	Percent women aged 15-49years who reported serious problems concerning getting money for health services	EDHS2014
Access/demand		
7. No current contraception method used	Percent women aged 15-49years who are not pregnant and do not currently use contraceptive method	EDHS2014
8. Unmeet need for family planning	Percent women aged 15-49years with unmeet need for family planning	EDHS2014
Service use		
9. No antenatal care (ANC)	Percent women aged 15-49years who had a live births in five years preceding the survey who did not receive ANC	EDHS2014
10. No regular antenatal care (ANC)	Percent women aged 15-49years who had a live births in five years preceding the survey who did not receive regular ANC (<4 visits)	EDHS2014
11. Birth was not protected against neonatal tetanus	Percent women aged 15-49years whose last livebirth was not protected against neonatal tetanus	EDHS2014
12. Home deliveries	Percent of livebirths in the 5 years preceding the survey born at home	EDHS2014
13. Birth not attended by skilled provider	Percent livebirths in the 5 years preceding the survey who were not delivered by skilled provider	EDHS2014
14. Caesarean section delivery	Percent livebirths in the five years preceding the survey that were delivered by caesarean section	EDHS2014
15. No postnatal checkup	Percent women aged 15-49years in the two years preceding the survey who had no postnatal checkup	EDHS2014
Health system outcome		
16. Never had clinical breast examination	Percent distribution of women aged 15-59years who never had any clinical breast examination	EHIS2015
17. No comprehensive HIV/AIDS knowledge in men	Percent men aged 15-49years who have no comprehensive HIV/AIDS knowledge	EHIS2015
18. No comprehensive HIV/AIDS knowledge in women	Percent women aged 15-49years who have no comprehensive HIV /AIDS knowledge	EHIS2015

II.2.2 Choice of social stratification

Measuring SRH inequalities involves identifying the appropriate socio-economic stratification that captures the difference in the population experience. Thus, before looking at summary measures of inequality, it is necessary to define the social stratification. In the literature, as well as, in Annexes

1-3, there is wealth of information that can be used to reflect the social dimensions of ill-SRH and guide policies to improve health and promote health equity.

The challenge is to identify the set of stratifiers sensitive to capture the SRH inequalities, as well as point to the underprivileged and underserved populations. The social stratifiers recommended in literature include gender, wealth, educational level, occupational status and place of residence. However, the use of many social stratification will not allow for identifying priority health inequalities. Thus, a minimum list of stratifiers will perform better in identifying priority SHR inequalities.

Thus, in this this exercise we considered the administrative geographic classification and wealth as good candidates for reflecting SRH inequalities. The reasoning for this builds on the availability of data on these two dimensions in almost all data sets. Furthermore, they provide an easy way in interpreting inequalities, which is appealing to policy makers.

A country's administrative geographic classification reflects the experience of the entire population within a geographic area and captures the potential vulnerabilities to SRH and services coverage within a locality. Most importantly, the geographic administrative classification is used for planning services and allows policy makers to identify the underprivileged geographic locations. Furthermore, the geographic administrative classification attracts attention to SRH inequalities and produce a standard method for monitoring progress overtime and even comparison between countries. The 6 administrative regions in Egypt (Urban governorates, Urban Lower Egypt, Rural Lower Egypt, Urban Upper Egypt, Rural Upper Egypt and Frontier governorate) were used as geographic stratifier.

The wealth index classified into 5 quintiles reflects the household living conditions, as well as the socio-economic status of individuals. The wealth quintiles allow for identifying social inequality in SRH, as well as help in detecting the socially disfavored groups. Furthermore, the wealth classification allows policy makers to promote the package of social policies in a country.

As noted earlier, the use of gender norm as a stratifier is an important contextually relevant contribution of this study. Not only is gender a key general determinant of SRH, but also it is well recognized that inequitable gender values are an important developmental challenge in Egypt. Such a challenge interacts with other social determinants and produce a highly unequitable contextual environment detrimental to SRH.

Due to the paucity of data, the analysis was forced to incorporate gendered practices and behavior in the index as proxy for gender norms. This in itself signals the need to better conceptualize and collect data that more adequately capture this stratifier.

The gendered cultural context index attempts to capture the gendered context within the locality in which women live. The gendered cultural context is assessed along two dimensions, namely attitudes and their translation in behaviors. With the Egyptian context, denial of education,

circumcision, early marriage and partner's violence are considered major features of the gendered conservatism. Box 7 shows the indicators used to build the gendered context index. The proportion of each of these indicators are calculated at the level of the locality. The index is developed as an additive index of the proportions of the indicators at the level of the locality. The index is classified into four categories of gendered cultural context; namely most conservative, conservative, less conservative and least conservative.

Box 7: Components of the gender dynamics index

Perception and attitudes	Practices and behavior
• Percent who reported ideal age at marriage for women below 18 years • Percent who believe that female circumcision is required by religion • Percent who justify wife beating for any reason	• Percent who married before age 18 years • Percent of women who are circumcised • Percent who were exposed to physical, emotional or sexual violence by husband • Percent who were exposed to violence by any person other than the husband • Percent with less than secondary education

It should be noted that the study is conscious that the stratifiers used do not cover the whole range of contextually relevant stratifiers. Each country needs to identify the particular groupings that reflect social stratification that are amenable to change through structural reforms. For example, occupational stratifiers could point out to health inequalities caused by higher risks in certain occupations. The investigation of such inequalities is a good advocacy tool for reforming occupational health policies and implementing specific preventive and protective policies for high risks occupations.

Stratifiers for SRH could be specifically composed to push to the forefront specific vulnerabilities that tend to be invisible. For example, forced displacement and migration status is a good candidate for an SRH straifiers in many Arab countries. The current analysis, with its reliance on few stratifiers, is but one step in the right direction. Further steps are usually curtailed not just by the invisibility of the social strata but also by absence of data

II.3. Methods

II.3.1. Identifying the priority sexual and reproductive health challenges
The first objective of the analysis was to identify the priority SRH conditions. The indicators were ranked according to their magnitude (incidence/prevalence) to identify the priority mortalities, morbidities, risk factors and HS determinants.

II.3.2. Identifying the most appropriate inequality measure for the different social categories
The second objective of the analysis was to estimate the level of inequality and to identify the priority geographic, wealth and gender SRH inequalities. A Thorough review of the scientific literature [24-32] to identify the inequality measures and a rigorous comparison among them measures was carried (see annex 4). The final decision was to implement the index of dissimilarity (ID%)

for non-ordered categorical social stratifier and the concentration index (rCI%)for the ordered social stratifier.

A cut off point to identify the priority inequality is defined as ID% and rCI%>10%

II.3.3. Conduct a trend analysis of sexual and reproductive health inequalities

The third objective of the analysis was to monitor progress of SRH inequalities over the past decade. Two data points over 10 years span (2005 and 2014)[22,33] were compared to monitor trends progress in SRH priorities and inequalities. The magnitude of ID% for non ordered social stratifiers and rCI% for ordered social stratifiers for the two periods were compared to monitor the SRH inequality trend.

II.3.4. Investigate the factors influencing the social inequalities and their relative weight for equity framing

The fourth objective was to generate evidence on relative weight of the social inequalities in defining ill-SRH inequalities. To meet this objective, the inequality literature offers a tool that decomposes the socioeconomic inequality in a health indicator into different shares that reflect the socioeconomic inequalities in the determinants of this health indicator. This tool is referred to in the literature as the decomposition analysis. (For more details on the statistical formulation of the methodology of the decomposition analysis, see Annex 5). An explanation of the interpretation of the decomposition analysis is presented in part five. Two priority SRH impact/outcome inequalities, namely multiparity and infant mortality, are presented as illustrations for the use of this tool.

Part Three: Assessing the Sexual and Reproductive Health Challenges

Though Egypt has experienced improvements in SRH outcomes, yet many challenges persist. The Sustainable Development Agenda offers a plausible road map for achieving the SRH goals in an equitable way. However, progress will not be achieved without evidence driven policies and strategies for achieving them.

This part intends to generate evidence on the priority SRH challenges with special emphasis on SRH inequalities. The aim of this part is to guide the policy and identify entry points in addressing SRH and their inequalities challenges.

III.1. Sexual and Reproductive Health Challenges

The national averages provide valuable evidence on the priority SRH challenges. The magnitude of the various SRH conditions will alert the national government to the existing SRH threats, as well as identify the challenges requesting nation-wide interventions.

- The priority SRH impact challenges include infant mortality, neonatal mortality and self-reported sexually transmitted diseases or their symptoms.
- Maternal mortality shows an impressive decline but continues to be relatively high
- Data on important SRH related morbidity are not available
- Over 30% of women carry a heavy burden of consanguineous marriages and marital violence (physical, sexual and emotional), while a quarter of women in the reproductive age suffer from anemia.

III.1.1 Sexual and Reproductive Health Impact

SRH-related mortalities and morbidities are the end products of the interplay of different forces. The mortality and morbidity indicators are expected to respond to the collective impact of the different determinants and the packages of interventions in a country to improve SRH.

A sensitive measure for pregnancy outcome and the reproductive healthcare services in a country is the infant mortality rate, especially during the neonatal period. Despite the significant decline, Egypt still has high neonatal and infant mortalities (Figure 3a). Over the past five years preceding the EDHS2014, the infant mortality is 22 per 1,000 livebirths, with two thirds occurring during the neonatal period. Further statistics show that in 2015, Egypt ranks 114 globally and 15th among the Arab States in neonatal mortality rate[34]. It is clear that further interventions to promote maternal health and reduce the negative pregnancy outcomes are needed.

Very few morbidity indicators are found to reflect SRH morbidities. Indicators on the SRH-related morbidities (both gynecological and obstetric) and the magnitude of HIV infection, as well as the puberty and the menopause experiences are not available, despite that these SRH challenges are of considerable impact on women's lives and well-being.

The only morbidity indicators in the data set are delayed primary fertility (>24months), self-reported sexually transmitted diseases (STIs) or their symptoms and HBV prevalence (definitions of all indicators are provided in Part Two). As shown in Figure 3b, the prevalence of STIs or their symptoms are prevalent among women in the reproductive age. One third of women 15-49years reported STIs or their symptoms. The prevalence of HBV infection is calculated for males and females and by two age groups (1-14 years and 15-59years) to reflect the success of the HBV control program and the gender influence in the spread of the infection. HBV prevalence is as low as 1% in the population 1-59years. The overall average in 15-59years old males is nearly double females in the same age group. It is true that HBV infection has markedly declined in the 1-14years old boys and girls, but still it exists with half of the cases occurring in the first four years of life. These results provide evidence that HBV is still a challenge in the country, the vertical transmission from mother-to-child is still occurring and the HBV vaccination coverage may not be reaching all newborns. By saying this, it is clear that STIs and HBV infection exist as SRH challenge in the country and point to the gender roles and their manifestations in the spread of diseases transmitted by sexual route.

Delayed primary fertility for more than 24months account for 2.4% of currently married women (Figure 3b). In Egypt, the culture and traditional practice call for early childbearing, thus delayed primary fertility is a cause of concern. Failure to conceive immediately after marriage is perceived as an indication of a gender role failure particularly from the women's side. However, as it is difficult to estimate if the delayed fertility is a planned choice or not, these results can be taken either as rough estimate of physical primary infertility or planned delayed pregnancy pending further investigation.

Figure 3: Sexual and reproductive health impact in Egypt

Figure 3a: Mortality per 1,000livebirths

Figure 3b: Sexual and reproductive morbidities (%)
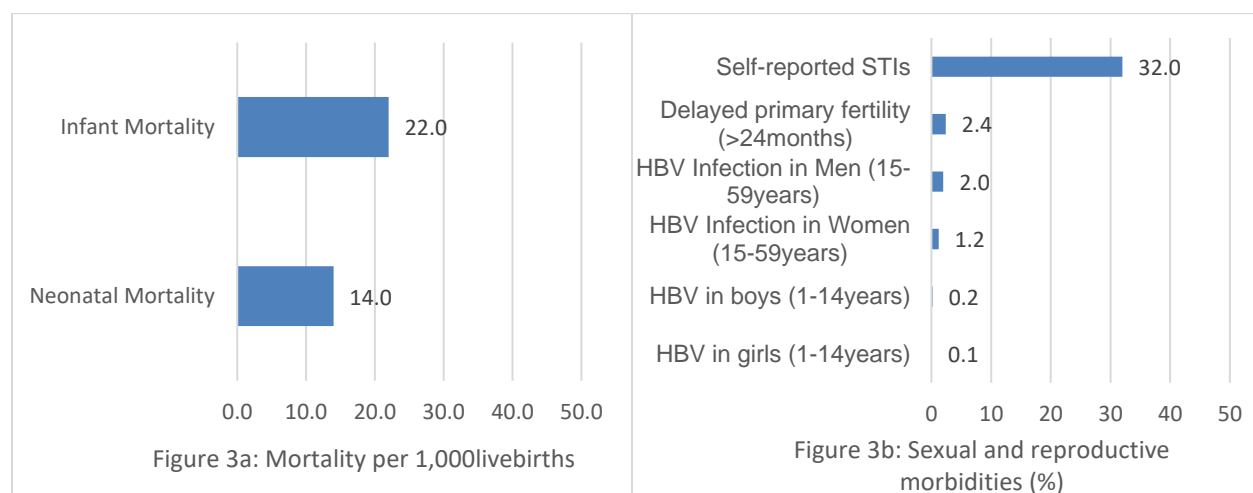
The maternal mortality and causes of women's death are not available in the analyzed population-based surveys. The other sources of data indicate an impressive speed of decline in the maternal mortality ratio (MMR) from 174 per 100,000livebirths in 1990 to 53 per 100,000livebirths in 2013[2, 34-36]. According to the global estimates, the MMR in Egypt is 33 per 100,000livebirths in 2015 and

the country ranks 74 globally and 10th among the Arab States[34] . Thus, it is evident that maternal mortality is still a priority in Egypt.

III.1.2. Sexual and Reproductive Health Risk Factors

The investigation of the SRH risk factors (outcomes) demonstrates that women carry a heavy burden of reproductive risk factors. As shown in Figure 4, the top risk factors of at least 30% prevalence include consanguineous marriages and marital violence (physical, sexual and emotional). Anemia among women in the reproductive age account for one quarter of cases.

Gendered norms and beliefs favor marriage among relatives. Though the biological risks are documented in the literature, one third of women are married to a relative of the family and carry the risk of passing congenital malformations on to the new generations. This practice is a social tradition encouraged by the belief of girls' protection and the preservation of the family resources. These same gendered norms assume male superiority and the right of husbands to resort to physical, emotional and sexual violence against their wives. The survey results indicate that one third of women experience all forms of marital violence. Even during pregnancy, 6.6% of women experience marital physical violence.

Early age at marriage (<18years) is a challenge on the national agenda. Despite the existence of the national law that prohibits the registration of marriage of girls before the age of 18, still 27.3% of the surveyed women married before reaching the legal age. Consequently, one out of ten adolescents 15-19years old girls start childbearing. These practices often force girls to drop out of schools and withdraw from the labor market.

Figure 4: Sexual and reproductive health risk factors in Egypt
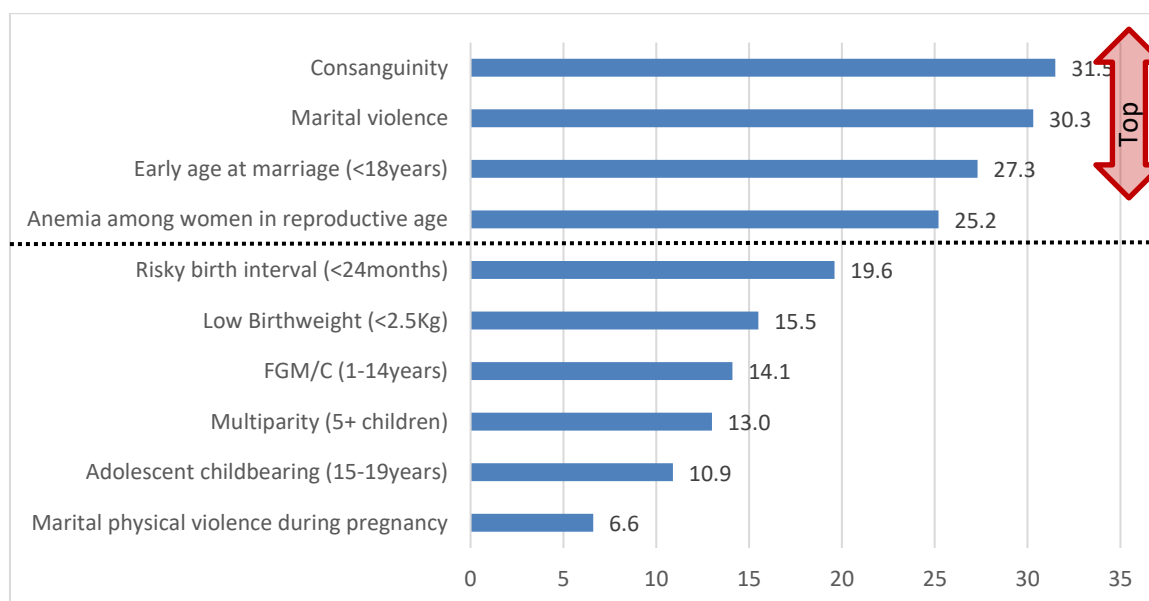
Around a quarter of ever- married women are anemic and 15.5% of their babies have low birthweight. There is no doubt that marrying and giving birth at an early age accompanied with multiple pregnancies can take a toll on women's health and threatened their newborns' health.

FGM/C has been practiced in Egypt since the Pharaonic period, and adherence to the custom remains widespread despite the government efforts to ban the practice. FGM/C accounts for 87.2% of ever married women 15-49years. However, it showed be noted that FGM/C has dramatically declined in the 1-14years old girls as it only accounts for 14% (Figure 4). This indicates the success of the efforts towards tackling this practice.

III.2 Inequalities in Sexual and Reproductive Health

This part attempts to identify the priority SRH inequalities. The following subsections describe the SRH distributions with respect to three social stratification – geographic location, wealth quintiles and gendered cultural context. This is followed by a summary inequality measure to assess the magnitude of the SRH inequalities.

III.2.1 Geographic Inequalities in Sexual and Reproductive Health Distribution

• Geographic locations exhibit different clusters of SRH challenges
• Rural Upper Egypt is the most underprivileged geographic location and carries the burden of most of SRH challenges
• The top geographic SRH impact inequalities include infant mortality, neonatal mortality and hepatitis B viral infection in both males and females.
• The top geographic SRH risk factors inequalities include multiparity, adolescent childbearing, female genital mutilation/cutting, early age at marriage and consanguinity.

The geographic regions in Egypt reflect the conditions in which people live and the experience of the entire community within a geographic area and capture the potential vulnerabilities to SRH.

Still the analyzed population-based surveys indicate SRH inequalities in the six geographic regions in Egypt (Urban governorates, Urban Lower Egypt, Rural Lower Egypt, Urban Upper Egypt, Rural Upper Egypt and Frontier governorate). Each geographic location is characterized by different cluster of SRH challenges (Table 2).

Rural Upper Egypt is the most underprivileged geographic location and carries the burden of most of these challenges. With regard to SRH impact indicators, neonatal mortality, infant mortality and self-reported STIs are highest in this region. For SRH risk factors, Rural Upper Egypt exhibits the highest prevalence of FGM/C in the new generation of 1-14years old girls and all other cultural and gender related practices (consanguinity, early age at marriage, early childbearing, multipartity and marital violence) and their biological manifestations (anemia among women in reproductive age and low birthweight).

Urban Upper Egypt also carries the burden of some SRH challenges. This region ranks second in HBV in men, STIs in women and third marital violence.

Rural Lower Egypt harbors several SRH challenges. This region shows the highest proportion of adolescent childbearing and ranks second for early age at marriage. Urban Lower Egypt has relatively lower rates and prevalence of SRH impact and risk factors than the other region. However, it ranks first in the proportion of delayed fertility and second in marital violence.

The Frontier Governorates rank first with highest proportions of risky birth interval and low birthweight. Also, the Frontier Governorates rank second for consanguinity and multiparity.

Though the Urban Governorates are expected to have the most favorable characteristics and better service coverage, this region ranks first for HBV infection in males and females and second in delayed fertility and marital physical violence during pregnancy.

Table 2: Geographic distribution of sexual and reproductive health challenges in Egypt

	Urban gov.	Urban Lower Egypt	Rural Lower Egypt	Urban Upper Egypt	Rural Upper Egypt	Frontier gov.
Impact						
Neonatal mortality	12.0	8.0	12.0	15.0	18.0	6.0
Infant mortality	16.0	14.0	19.0	20.0	29.0	13.0
Delayed primary infertility (>2years)	2.8	2.9	2.0	2.4	2.8	2.1
Hepatitis B infection in males (1-59years)	2.2	1.1	0.8	2.1	1.1	0.7
HBV infection in females (1-59years)	1.2	0.5	0.5	1.0	0.9	0.5
Self-reported STIs	27.1	30.2	32	33.3	34.7	27.6
Risk factors						
Female genital mutilation/cutting (1-14years)	8.0	5.7	11.5	16.6	21	15.0
Consanguinity	20.7	19.2	27.7	30.0	47.9	37.2
Early age at marriage (<18years)	14.4	15.3	26.1	23.3	41.8	25.8
Adolescent child bearing (15-19years)	3.6	6.5	14.3	5.1	14.2	11.0
Multiparity (5+ children)	5.6	6.0	9.4	14.3	23.9	16.5
Risky birth interval (<24months)	17.6	16.4	17.8	18.9	23.2	27.6
Anemia Among women in reproductive age	21.2	23.9	21.6	28.9	31.4	20.2
Low birthweight (<2.5Kg)	14.5	11.7	15.0	17.3	17.7	19.1
Marital violence	29.0	30.1	28.8	29.5	33.8	25.5
Marital physical violence during pregnancy	7.5	6.5	5.5	6.1	8.0	3.6

There is no doubt that maternal mortality is a major indicator of SRH impact. Since assessing its geographical distribution is important in showing regional differentials in SRH, information from The National Maternal Mortality Study in 2000 was used[36]. In this survey, Egypt is classified in 4 geographic regions (Metropolitan/Urban Egypt, Lower Egypt, Upper Egypt and the Frontier governorates). There are significant regional differences in MMR. Urban Egypt has the least MMR (48 per 100,000livebirths), followed by Upper Egypt then Lower Egypt, (89% and 93 per 100,000livebirths respectively) while the Frontier has the highest MMR of 120 per 100,000livebirths[36].

Since the geographic region is a non-ordered health stratifier, the ID% is calculated to estimate the magnitude of inequalities and identify the priority geographic SRH inequalities. The data indicate varying levels of inequality.

As shown in Figure 5a, for impact SRH indicators, the geographic inequalities in infant mortality and neonatal mortality are high (11.4% and 10.0% respectively), while geographic inequality in MMR is moderate (7.2%).

Despite the low prevalence of HBV infection, the magnitude of the geographic inequalities among males (ID%= 17.7%) and females (ID%= 15.4%) between 1-59years are high (Figure 5b). HBV is transmitted through blood and its products, as well as through sexual relations and from mother to child during pregnancy and delivery. Egypt has a well established HBV vaccination program since the early 1990s, but our results suggest that HBV is still existing at low prevalence in some geographic areas, notably the Urban Governorates.

Delayed fertility, an outcome of several SRH infections, show moderate inequality of 7.6% by geographic location. Self-reported STIs are highly prevalent in all regions and have low inequality in distribution (Figure 5b).

Figure 5: Geographic sexual and reproductive health impact inequalities in Egypt

Figure 5a: Geographic inequalities in mortality

Figure 5b: Geograophic inequalities in SRH morbidity
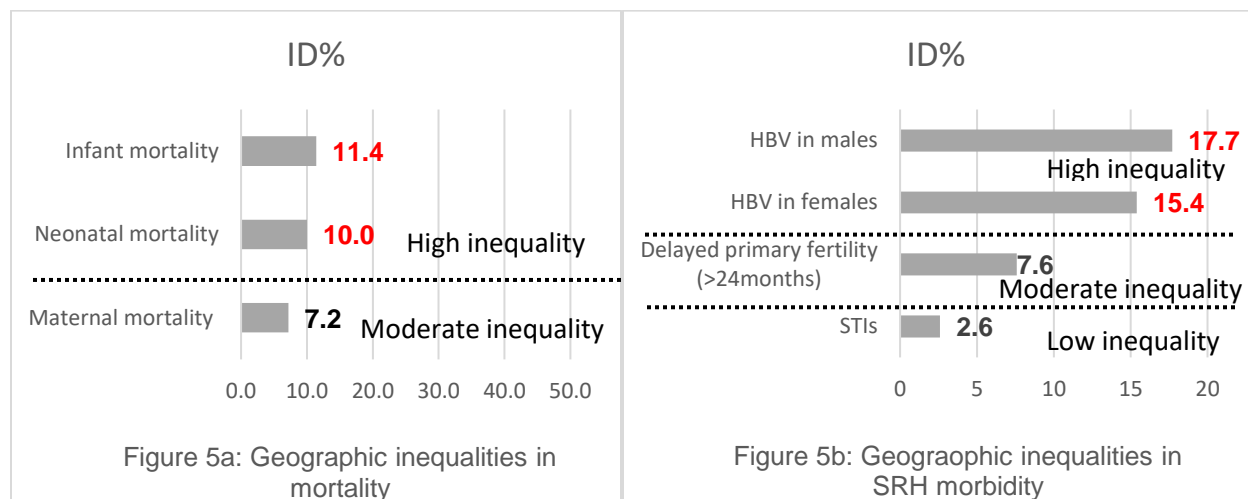
Five risk factors are on the top of the geographic inequality list with a magnitude exceeding 10% (Figure 6). All are manifestations of culture beliefs and gender norms, they are mostly prevalent in Rural Upper Egypt.

Multiparity comes first on the list with an inequality magnitude of 23.5%. Adolescent childbearing comes next and is clearly more prevalent in rural settings in Upper Egypt and Lower Egypt. FGM/C in 1-14years, early age at marriage and consanguinity are still wide spread practices with pockets in Rural Upper Egypt.

Anemia in reproductive age, marital physical violence during pregnancy and risky birth interval have moderate uneven distribution ranging from 5-10%. While low birthweight and marital violence show low unequal distribution ranging from 2-5%.

Figure 6: Geographic sexual and reproductive health risk factors inequalities in Egypt
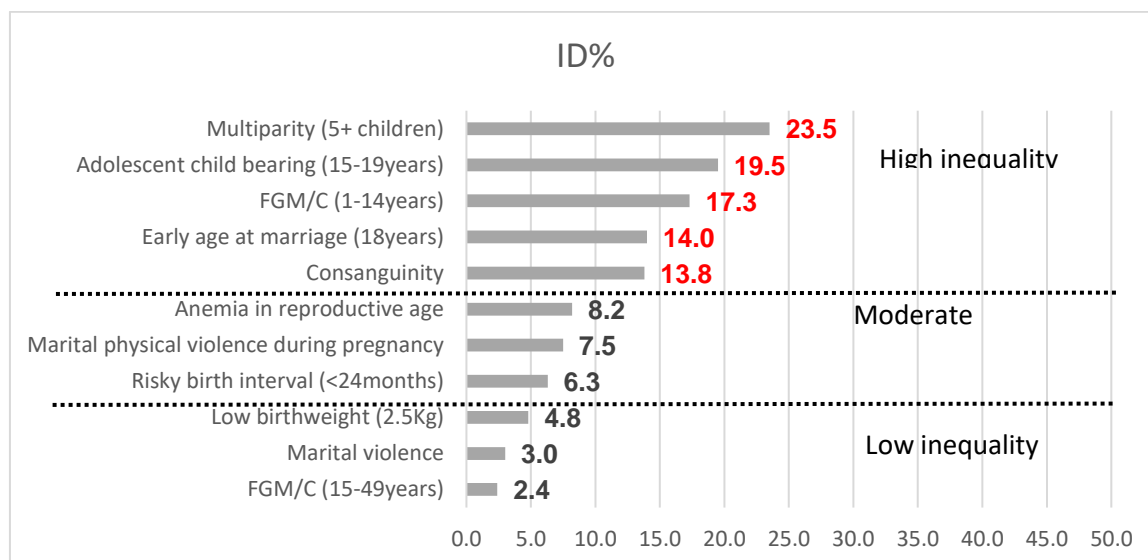
III.2.2 Wealth Inequalities in Sexual and Reproductive Health

• The poorest population subgroup carries most of the SRH challenges
• Exceptions include Hepatitis B infection, which is more prevalent among the rich and adolescent child bearing, which is highly concentrated among the average wealth population.
• The top wealth related SRH impact inequalities include hepatitis B infection in males.
• The top wealth related SRH risk factors inequalities include multiparity, early age at marriage, female genital mutilation/cutting in 1-14years old and consanguinity.

For SRH impact indicators, the distribution of neonatal and infant mortalities reflects high concentration among the poorest population subgroups (Table 3). On the other hand, HBV infection in men and women and delayed fertility appear to be higher among the rich. The pattern of STIs distribution appear to be highest among the middle population subgroup including the poorer, the average and richer subpopulations.

All SRH risk factors vary across the wealth quintiles (Table 3). All other risk factors, except for adolescent childbearing are highly concentrated among the poorest population group. Adolescent childbearing is more pronounced among the average population.

Table 3: Wealth distribution of sexual and reproductive health challenges in Egypt

	Poorest	Poorer	Average	Richer	Richest
Impact					
Neonatal mortality	18.0	14.0	14.0	13.0	9.0
Infant mortality	27.0	23.0	24.0	20.0	13.0
Delayed pregnancy (>2years)	2.3	2.3	2.1	2.3	3.2
Hepatitis B infection in males (1-59years)	0.8	0.9	1.0	1.9	1.5
HBV infection among in females (1-59years)	0.3	0.9	1.0	0.7	1.0
Self-reported STIs	32.6	32.9	33.1	32.8	28.4
Risk factors					
Female genital mutilation/cutting (1-14years)	22.8	16.3	12.9	11.3	5.4
Consanguinity	44.6	37.5	31.7	26.0	19.3
Early age at marriage (<18years)	44.5	36.7	26.2	21.0	9.7
Adolescent child bearing (15-19years)	9.2	10.8	19.0	13.1	4.0
Multiparity (5+ children)	27.0	18.1	8.8	8.3	4.4
Risky birth interval (<24months)	23.3	19.3	15.5	15.0	12.3
Anemia Among women in reproductive age	29.6	26.3	23.4	21.8	26.0
Low birthweight (<2.5Kg)	18.7	17.3	15.9	14.2	12.8
Marital violence	36.7	32.0	29.6	30.0	24.1
Marital physical violence during pregnancy	7.7	7.4	6.1	7.2	4.6

As shown in Figure 7a, wealth inequalities in infant and neonatal mortalities appear to be of moderate magnitude (8.0%, 7.1% respectively). The magnitude of the wealth inequalities in HBV infection is very high in males accounting for 11.8% (Figure 7b), and moderate in women (9.2%).

Figure 7: Wealth sexual and reproductive health impact inequalities in Egypt

Figure 7a: Wealth inequalities in mortality

Figure 7b: Wealth inequalities in morbidity
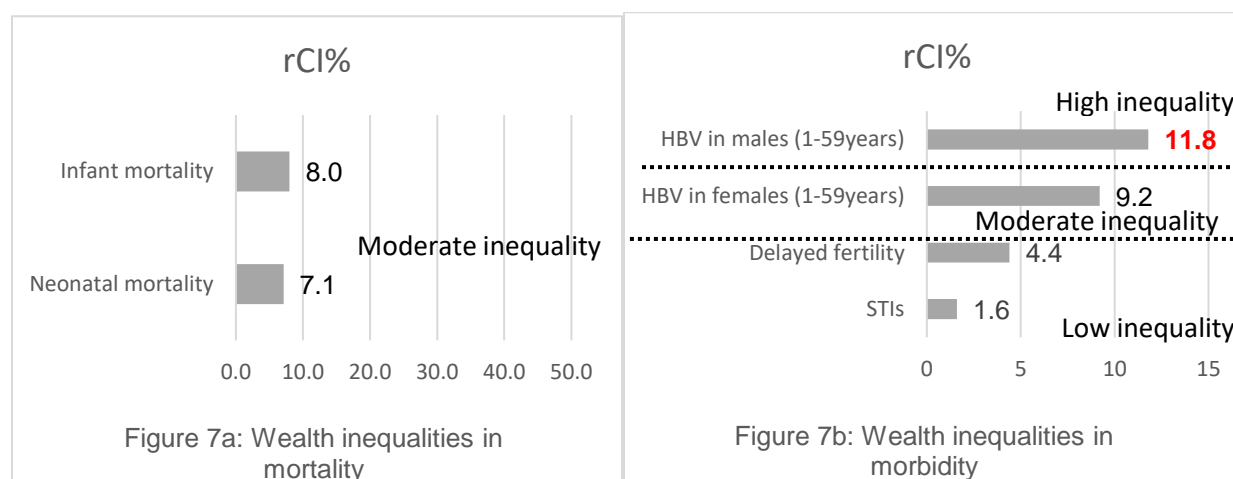
The magnitude of wealth inequalities in delayed fertility is average accounting for 4.4% uneven distribution, while the self-reported STIs do not differ much across the wealth quintiles

The highest inequalities in risk factors (Figure 8) across the wealth categories are multiparity, early age at marriage, FGM/CC (1-14years) and consanguinity pointing to the need for targeted interventions to change these practices among the poor. Risky birth interval, marital violence during pregnancy, all forms of marital violence and low birthweight come next with moderate uneven distribution ranging from 5-10%. Inequalities in adolescent childbearing and anemia in reproductive age tend to be of low inequality magnitude ranging from 2-<5%.

Figure 8: Wealth sexual and reproductive health risk factor inequalities in Egypt
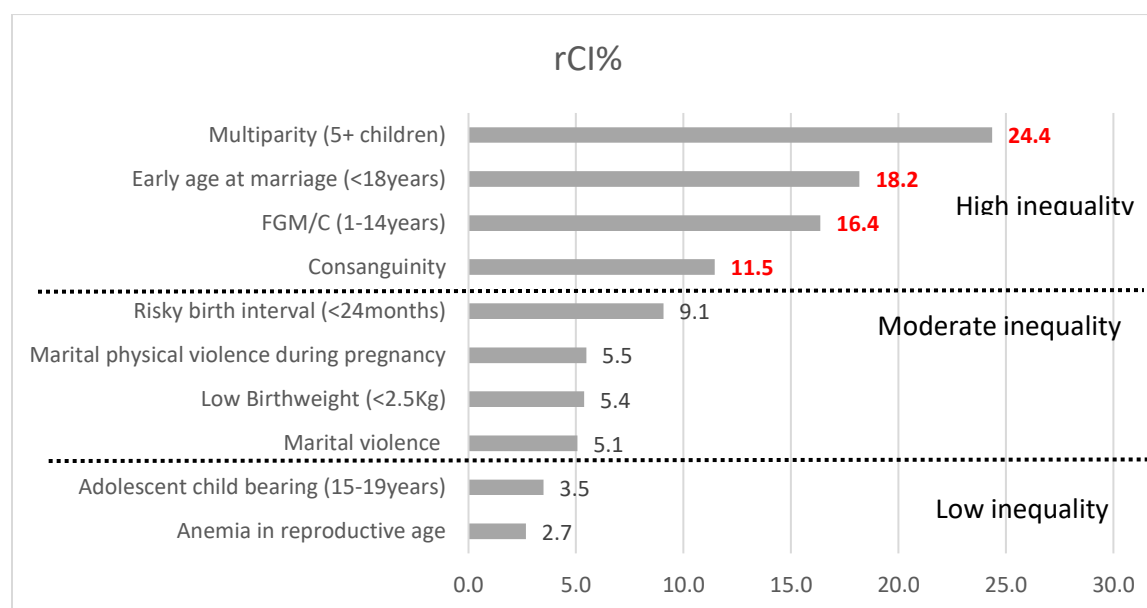
III.2.3. Gender Norms and Sexual and Reproductive Health Inequality

- Women living in the most conservative gendered cultural context carry the burden of the majority of SRH impact
- Exceptions include self-reported STIs which are highest among the conservative and delayed primary fertility which is concentrated in the two extremes (the most and least conservative).
- All SRH risk factors are concentrated among women living in the most conservative gendered cultural context
- Exceptions include marital violence that tend to affect all gender groups.
- The highest SRH impact inequalities across the gendered cultural context index include infant mortality and neonatal mortality.
- The highest SRH risk factors inequalities across the gendered cultural context index include multiparity, young generations FGM/C, adolescent childbearing, early age at marriage and consanguinity

As shown in Table 4, the most gender conservative carry the burden of all SRH impact except self-reported STIs which are highest among the conservative and delayed primary fertility is concentrated at in the two extremes (the most and least conservative).

Table 4: Gender distribution of sexual and reproductive health challenges in Egypt

	Most conservative	Conservative	Less conservative	Least conservative
Impact				
Neonatal mortality	1.8	1.5	1.0	1.0
Infant mortality	3.0	2.1	1.8	1.5
Delayed primary fertility (> 2years)	2.8	2.4	2.2	2.8
Hepatitis B infection in males (1-59years)	2.9	2.6	1.8	1.5
HBV infection in in females (1-59years)	3.1	1.6	1.7	1.4
Self-reported STIs	40.4	34.8	36.7	32.1
Risk factors				
Female genital mutilation/cutting (1-14years)	23.8	21.7	11.6	6.2
Consanguinity	45.3	31.5	25.3	20.3
Early age a marriage (<18years)	38.5	30.5	21.3	15.0
Adolescent childbearing (15-19years)	19.0	14.0	10.3	6.6
Multiparity (5+ children)	19.0	10.6	7.5	4.4
Risky birth interval (<24months)	19.5	16.1	16.1	14.6
Anemia among women in reproductive age	29.2	25.3	24.4	20.5
Low birthweight (<2.5Kg)	16.4	15.4	14.6	12.0
Marital violence	19.6	21.7	23.5	22.5
Marital physical violence during pregnancy	5.4	5.5	5.0	5.3

All SRH risk factors are concentrated in the most gender conservative groups except for marital violence that tend to affect all gender groups. Also, the marital physical violence during pregnancy does not vary much by gender norms. The fact that marital violence affects all women regardless of the gender norm classification may imply that the gender norm does have negative manifestations even among the least conservative social groups. It, also, implies that the gender norm is a concern in itself. Another interpretation is that marital violence is affected by cultural and traditional values.

Gender-related inequalities in infant and neonatal mortalities are evident with rCI% exceeding 10% (Figure 9a). The gender-related inequality in HBV infection in men (4.9%), HBV infection in women (2.1%), and delayed primary fertility (2.0%) are low (Figure 9b).

Figure 9: Gender sexual and reproductive health impact inequalities in Egypt

Figure 9a: Gender inequalities in mortality

Figure 9b: Gender inequalities in morbidity
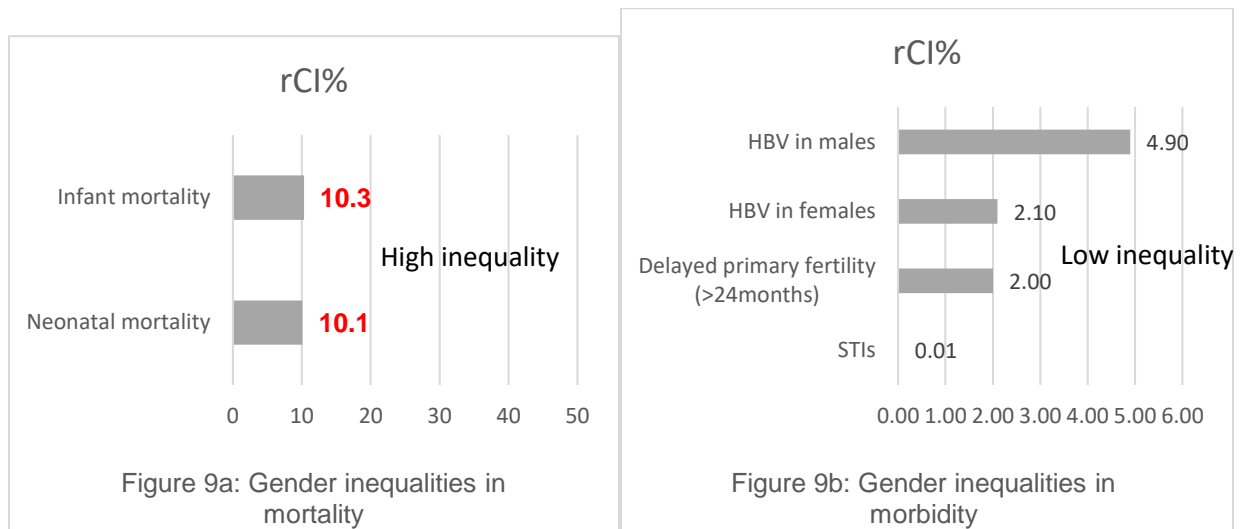
The gender related risk factor inequalities operate in multiparity, FGM/C, adolescent childbearing, early age at marriage and consanguinity (Figure 10). These results confirm that the gender norms are responsible for the SRH risk factors among the most gender conservative populations with consequent SRH mortality and morbidity. The role of the women as housewife, mother and care-giver draws her life profile. The most gender conservative marry at an early age to a relative and start childbearing early carrying higher risk of neonatal and infant mortality.

Figure 10: Gender sexual and reproductive health risk factors inequalities in Egypt
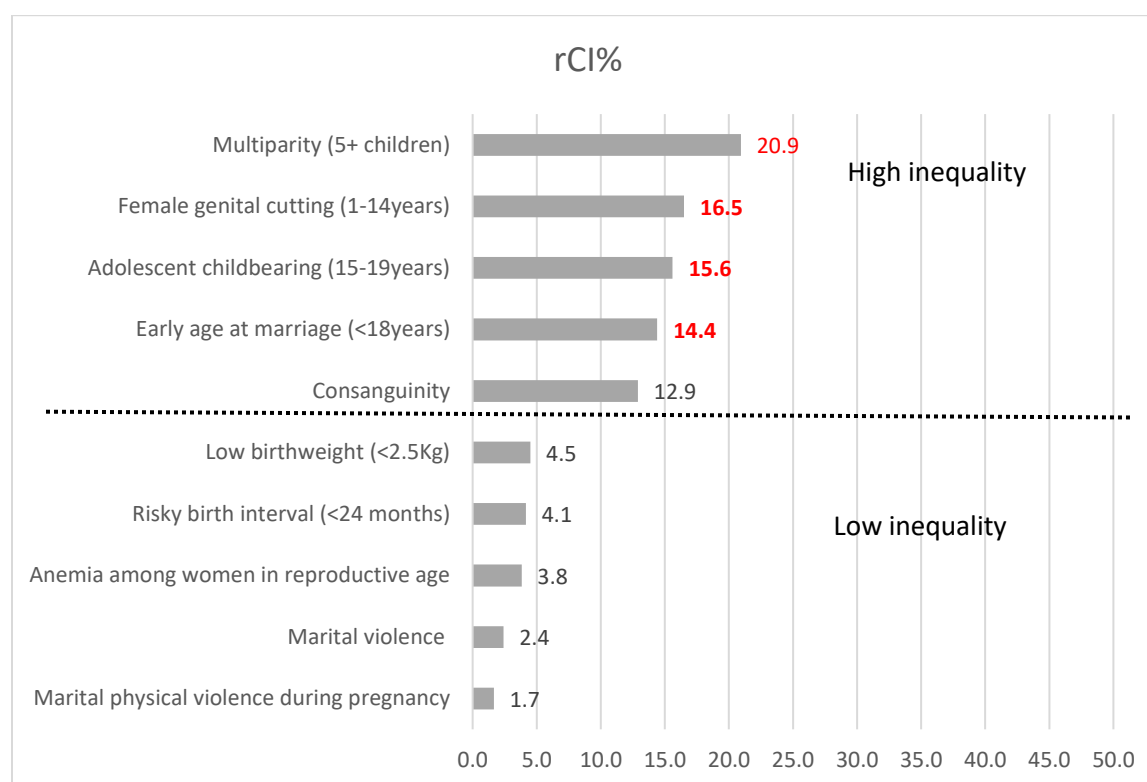
III.3 Sexual and Reproductive Health Challenges vs. Sexual and Reproductive Health Inequalities

- Self-reported STIs, anemia among women in the reproductive age and marital violence are nationwide priority challenges with no inequalities
- Neonatal mortality, infant mortality and consanguineous marriages are high priorities with inequalities on some stratifiers
- Young generation FGM/C, early age at marriage, multiparity and adolescent childbearing are low or average health priorities with large inequalities across some stratifiers
- SRH inequalities are the product of more complex process of social stratification
- The fact that SRH inequalities are observed among vulnerable groups across more than one stratifier indicates the complexity of addressing SRH inequalities
- Geographic inequalities capture a much wider range of SRH inequalities than those captured within wealth and gendered cultured context classification.

Prevalence and rates as average measure of SRH challenges alert countries to the prevailing nationwide SRH priorities. However, inequalities point to the needs of the uneven distribution of the burden of the SRH among the different social groups. A comparison between the SRH priorities and the SRH inequalities priorities is carried out to examine the similarities or dissimilarities between these priorities. Table 5 provides three key messages:

- First, the priority SRH challenges are not necessarily the priority SRH inequalities.

Table 5 shows that some SRH conditions such are nationwide priorities that are not significantly unequal among the three social stratifiers used in the current study. These highly prevalent nationwide SRH challenges require nationwide polices to address them.

Other SRH conditions such as neonatal mortality, infant mortality, early age at marriage and consanguineous marriages are not just high, but are also concentrated in Rural Upper Egypt and among the most conservative gendered context. They require both nationwide policies, as well as differentiated ones to respond to the needs of the underprivileged population subgroups.

While young generation FGM/C, multiparity and adolescent childbearing are relatively not highly prevalent but are priority geographic, wealth and/or gender inequalities. These conditions require targeted interventions to reach the socioeconomic disfavored populations.

Table 5: Summary of priority sexual and reproductive health challenges

	Priority challenges	Priority inequalities challenges		
	Average (≥20%)	Geographic (ID% ≥ 10%)	Wealth (rCI%≥10%)	Gender (rCI%≥10%)
Impact				
Maternal mortality*	[RED]		Not available	Not available
Neonatal mortality*	[RED]	Rural Upper Egypt		Most conservative
Infant mortality*	[RED]	Rural Upper Egypt		Most conservative
Delayed primary fertility (>24months)				
Hepatitis B infection in males (1-59years)		Urban gov. Urban Upper Egypt	Rich [RED]	
HBV B infection in females (1-59years)		Urban gov.		
Self-reported STIs	[RED]			
Risk factors				
Female genital mutilation/cutting (1-14years)		Rural Upper Egypt	Poor	Most conservative
Consanguinity	[RED]	Rural Upper Egypt	Poor	Most conservative
Early age at marriage (<18years)	[RED]	Rural Upper Egypt	Poor	Most conservative
Adolescent child bearing (15-19years)		Rural Upper Egypt Rural Lower Egypt		Most conservative
Multiparity (5+ children)		Rural Upper Egypt	Poor	Most conservative
Risky birth interval (<24months)				
Anemia Among women in reproductive age	[RED]			
Low birthweight				
Marital violence	[RED]			
Marital physical violence during pregnancy				

* Priority was judged in comparison to other countries worldwide and in Arab states

- Second, SRH inequalities are the product of more complex process of social stratification

The fact that SRH inequalities are observed among vulnerable groups across more than one stratifier indicates the complexity of addressing SRH inequalities. For example, the interplay among the limited resources, poverty and conservative gendered context in Rural Upper Egypt favor the spread of FGM/C, consanguinity, early age at marriage and multiparity.

It is also worth mentioning that urbanization and the life style in such settings, notable among the economically enabled is still a matter of concern. The urban life style, the culture sensitivity and serious stigma towards diseases transmitted by sexual route as STIs and HBV infection, contribute to their unperceived existence.

- Third, the geographic inequalities capture a much wider range of SRH inequalities than those captured within wealth and gendered cultured context classification.

For example, though wealth inequalities were evident, wealth as a social stratification was not able to emerge the inequalities in infant and neonatal mortalities and the adolescent childbearing as priorities, as apparently they are more related to the locality resources and gender norms. Also gender norms as a stratifier was not able to illustrate the wealth and urban life style influence on the

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spread of diseases transmitted by several modes including the sexual route as HBV infection. The geographic classification in Egypt does not just express vulnerabilities of living conditions and inadequate public services. They also express the different clustering of poverty and the classification of gender norms.

III.4. Trend in Sexual and Reproductive Health Inequalities

• The decline in overall averages does always translate into a tapering inequality gap.
• Infant mortality has declined but the geographic inequality has slightly decreased. However, neonatal mortality, FGM/C, consanguinity and multiparity showed a decline over the past 10years, but the geographic inequalities widened with Rural Upper Egypt carrying the highest burden.
• Adolescent childbearing is on rise and is concentrated in Lower Egypt, Rural Upper Egypt and the Frontier Governorates.
• Early age at marriage declined with a significant decline in Rural Upper Egypt narrowing the geographic inequality gap

Monitoring progress over time is a major request among policy makers so they can assess the success or the failure of their policies. The Commission of Social Determinants of Health called for monitoring progress in the health indicator as well as its inequalities among the different social groups. In this section, some illustrations of monitoring progress in inequalities in SRH indicators across geographic region are presented. The aim of this is exercise is to show how improvement in some indicators are not commonly accompanied with improvement in their inequalities but in some cases the inequalities increase. The analysis uses the available data that allow for comparison of the geographic inequality trend over a 10-year period.

The data show that over the past decade, most of the overall averages in SRH challenges have improved, but the geographic inequalities are widening. The infant mortality has declined from 63 per 1,000 livebirth in 2005 to 22 per 1,000 livebirth in 2014. While the decline has occurred in all regions, the geographic inequality has slightly decreased from ID% of 12.8% in 2005 to 11.4% in 2014 (Figure 11a) with Rural Upper Egypt lagging behind. The neonatal mortality was halved from 30 per 1,000 live birth to 14 per 1,000 live birth during the same period; however, the decline was slow in Rural Upper Egypt and was nearly stagnant in the urban governorates ending in a nearly doubled geographic inequality from ID% of 4.7% to 10.0% (Figure 11b). These results confirm the need for targeted interventions in addition to the nationwide strategies to reach the underprivileged populations, in particular in this case women residing in Rural Upper Egypt

Figure 11: Trend in geographic inequalities in infant and neonatal mortality in Egypt

Figure 11a: Infant Mortality (per 1,000livebirths)

Figure 11b: Neonatal Mortality (per 1,000livebirths)

Urban gov. —Urban Lower Egypt —Rural Lower Egypt —Urban Upper Egypt —Rural Upper Egypt —Frontier gov.
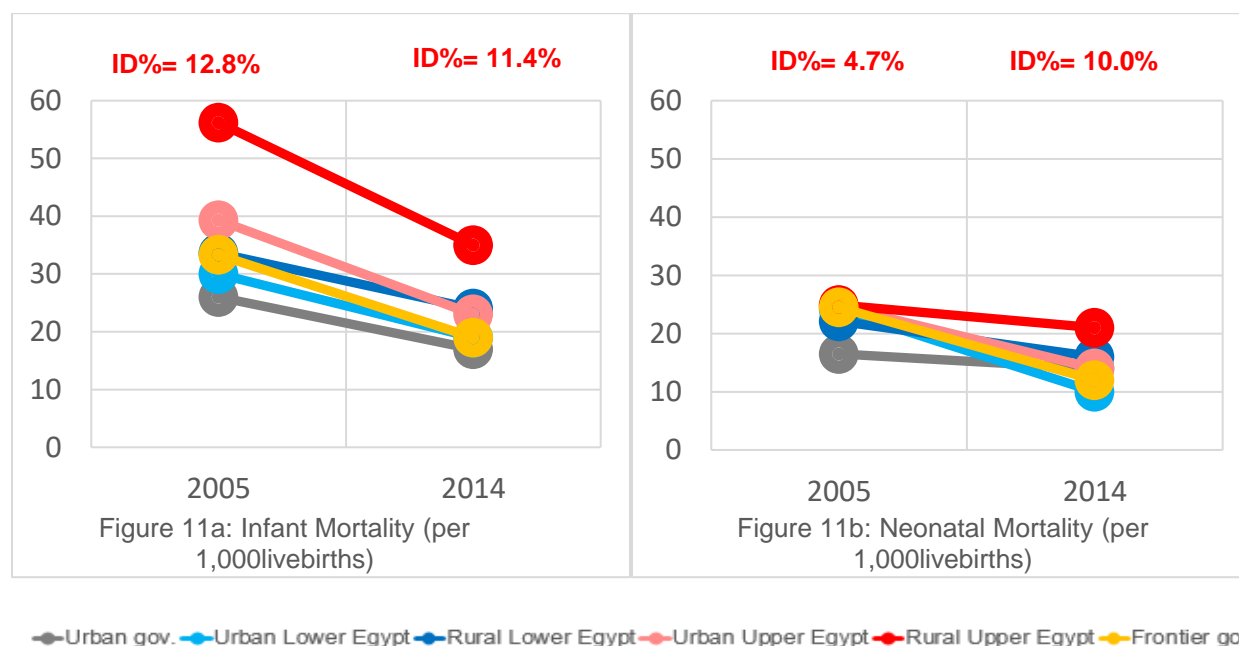
As data on young generation FGM/C were not available for the year 2005, the trend of the practice over the 10years in 15-49years is used to assess the progress over time. FGM/C in 15-49years old women has declined from 95.8% in 2005 to 87.2% in 2014. However, this decline was slower in Rural Upper Egypt than the other regions, which has led to widening of the geographic inequality with ID% increasing from 1.7% to 2.4% (Figure 12a). This piece of information reflects the pocket of FGM/C among the young generation in Rural Upper Egypt which needs more targeted efforts in Rural Upper Egypt and among the poor.

Consanguinity appears to be a persistent practice in the country. Consanguineous marriages remain nearly stagnant in Rural Upper Egypt and has shown very slow progress in the other regions over the past decade with slight widening of the geographic inequalities from ID% of 13.6% in 2005 to 13.8% in 2014 (Figure 12b). This confirms the fact that consanguineous marriage is a national concern with concentrated pockets in Rural Upper Egypt and among the poor and most gender conservative necessitating nationwide and differentiated policies and interventions.

Figure 12: Trend in geographic inequalities in female genital cutting and consanguinity in Egypt

Figure 12a: Female Genital Mutilation/Cutting in 15-49years (%)

Figure 12b: Consanguinity (%)

Urban gov. — Urban Lower Egypt — Rural Lower Egypt — Urban Upper Egypt — Rural Upper Egypt — Frontier gov.
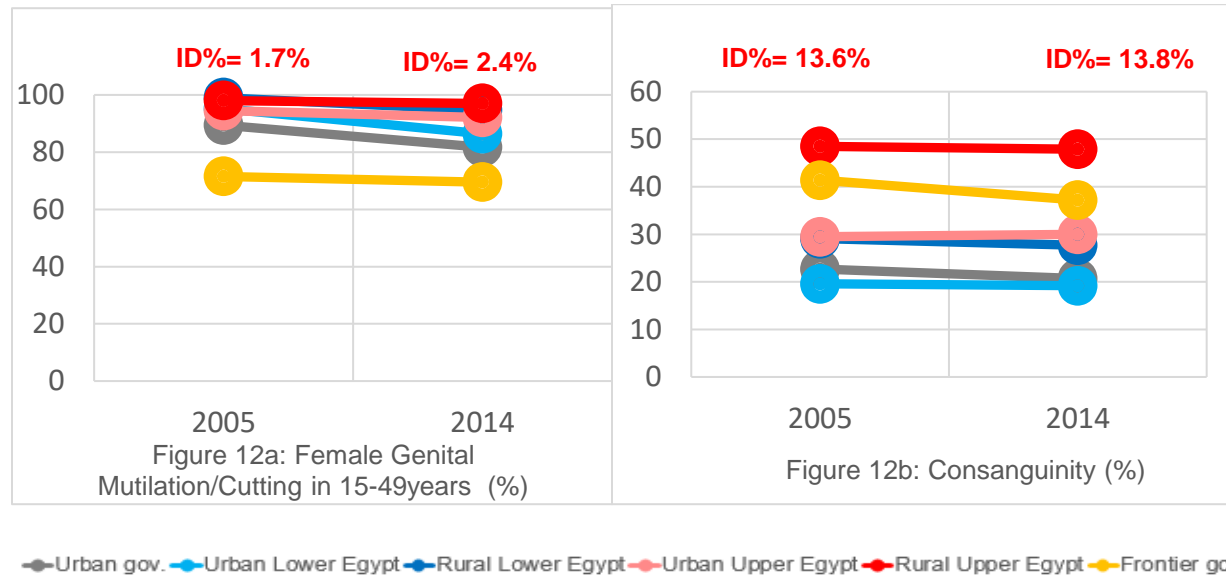
Early age at marriage is a national priority, the practice has declined from 33.9 in 2005 to 27.3% in 2014. There has been a more significant decline in Rural Upper Egypt than the other regions reducing the geographic inequality from ID of 18.1% to 14.0% (Figure 13a). Thus, it is apparent that the national polices were effective in reaching the most vulnerable social groups.

Most importantly, there is an upward trend in adolescent childbearing, which has slightly increased from 9.4% in 2005 to 10.9% in 2014. Only the Urban Governorates and Urban Upper Egypt have shown a modest decline, yet adolescent childbearing has increased in Lower Egypt with its urban and rural areas, Rural Upper Egypt and the Frontier Governorates resulting in a clear increase in the geographic inequalities from ID% of 15.0% in 2005 to 19.5% in 2014 (Figure 13.b).

Furthermore, multiparity has declined from 21.5% in 2005 to 13.0% in 2014. Although the decline was significant in Rural Upper Egypt, the ID% has increased from 17.0% to 23.5% (Figure 13c).

It is apparent that the national efforts over the past decades to reduce adolescent childbearing and multiparty were not sufficiently effective in all social groups and have led to widening the geographic inequalities. The fact that confirms the need for targeted policies and interventions to reach the underprivileged social groups in rural settings notably Rural Upper Egypt.

Figure 13: Trend in geographic inequalities in early age at marriage, adolescent child bearing and multiparity in Egypt
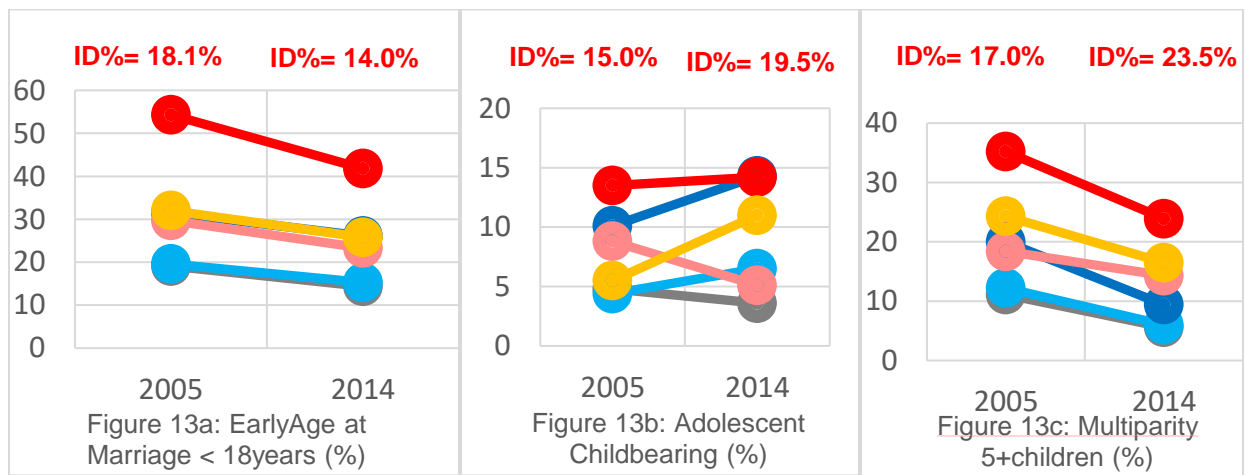
Figure 13a: EarlyAge at Marriage < 18years (%)

Figure 13b: Adolescent Childbearing (%)

Figure 13c: Multiparity 5+children (%)

ID%= 18.1% ID%= 14.0% ID%= 15.0% ID%= 19.5% ID%= 17.0% ID%= 23.5%

Urban gov. — Urban Lower Egypt — Rural Lower Egypt — Urban Upper Egypt — Rural Upper Egypt — Frontier gov.

Part Four: Health System Responsiveness to Sexual and Reproductive Health

Despite the significant progress made to address the SRH challenges and provide quality services to the population at large, Egypt is still facing significant SRH inequalities. Thus, the government is not only confronted with the difficult task of making further progress towards better SRH, it is also required to fairly distribute the services and resources in response to different health needs. Below are some evidence on health system priorities in an attempt to guide the health policies and identify the requested contribution from the non-health sector.

IV.1. Health System Responsiveness to Sexual and Reproductive Health Needs

The previous part has identified priority SRH challenges. These challenges call for responsive health system programs and adequate health services. The list of available health system indicators guided by the health system-monitoring framework can simply grouped with two broad dimensions. The first is a HS performance dimension including prevention programs, family planning and perinatal services. The second is a HS capacity dimension reflecting the availability, accessibility and affordability of services.

- The top healthcare system performance challenges fall in the prevention programs and the reproductive healthcare.
  - o Over 97% of ever-married 15-49years old women never had breast cancer screening, while over 90% of men and women do not have HIV/AIDS comprehensive knowledge.
  - o Cesarean section deliveries are strikingly very high accounting for over half of deliveries.
  - o Over 40% of non-pregnant currently married 15-49years women do not use a contraception method
- The top HS capacity challenges reside in the availability of services. These challenges include unavailable medication and unavailable healthcare provider

IV.1.1 Health System Performance Challenges

The HS performance in Egypt face a number of challenges (Figure 14). The top healthcare challenges apparently rely in the prevention programs. Over 97% of ever-married 15-49years old women never had breast cancer screening, while over 90% of men and women do not have HIV/AIDS comprehensive knowledge.

Most importantly, cesarean section deliveries (C-section) in Egypt are strikingly very high. Over half of the babies born in the 5 years preceding the survey was delivered by C-section. This high prevalence of cesarean section deliveries is far from being medically justified or simply explained by the health system failure to address the reproductive health challenges.

Family planning programs is still a concern as over 40% of non-pregnant currently married 15-49years women do not use a contraception method and 12.6% of ever-married women in the reproductive age have family planning unmet need. Furthermore, a quarter of women did not receive tetanus vaccination during the antenatal period and 17.2% of pregnant women do not regularly go for antenatal (ANC) visits.

Despite the shift towards facility-based delivery, still 13.3% of women deliver at home, 8.5% of the deliveries are in the hands of unskilled providers. In addition, the ANC and postnatal care miss many women (9.7% and 16.5% respectively).

Figure 14: Sexual and reproductive healthcare system performance
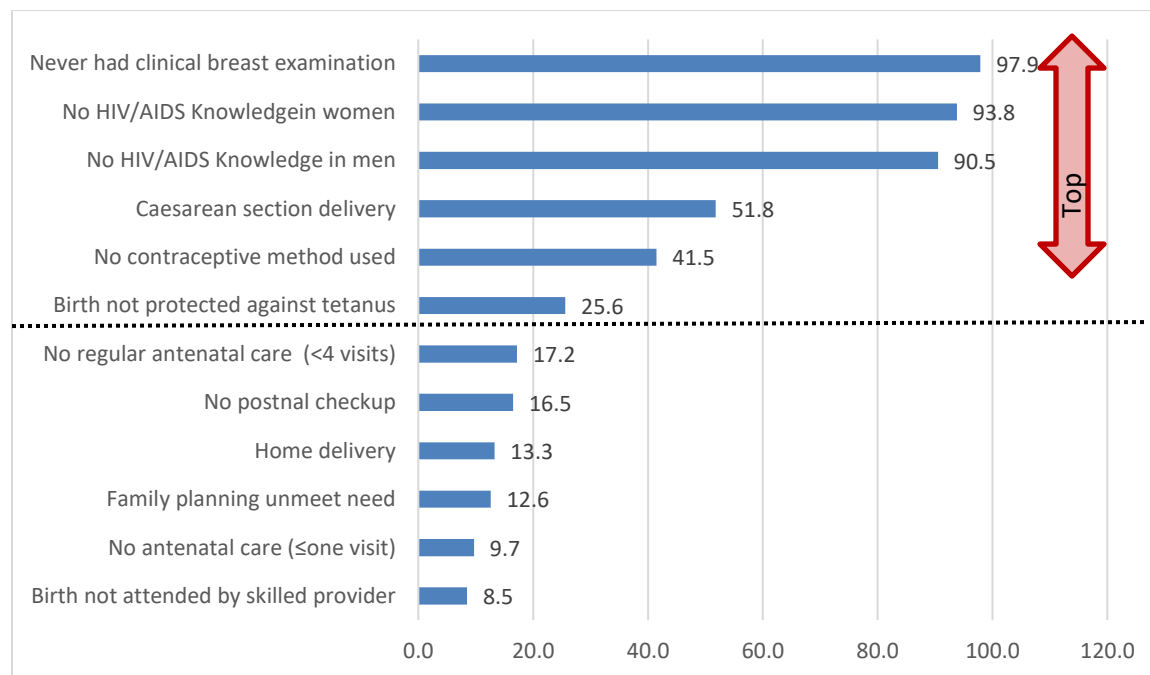
IV.1.2 Health System Capacity Challenges

The HS challenges reside in its capacity and planning to run the healthcare services. It is evident from Figure 15 that healthcare services are not always available, accessible or affordable. Around half of the women reported the unavailability of medication and health care providers, while one third claimed absence of female provider in the health care facility.

In addition, one fifth of women complained that they have serious problems in finding transportation to access the healthcare facilities and 18% reported that the healthcare services were far away from their place of residence. In addition, 10.5% of women complained of unaffordable healthcare services.

Figure 15: Health System Capacity
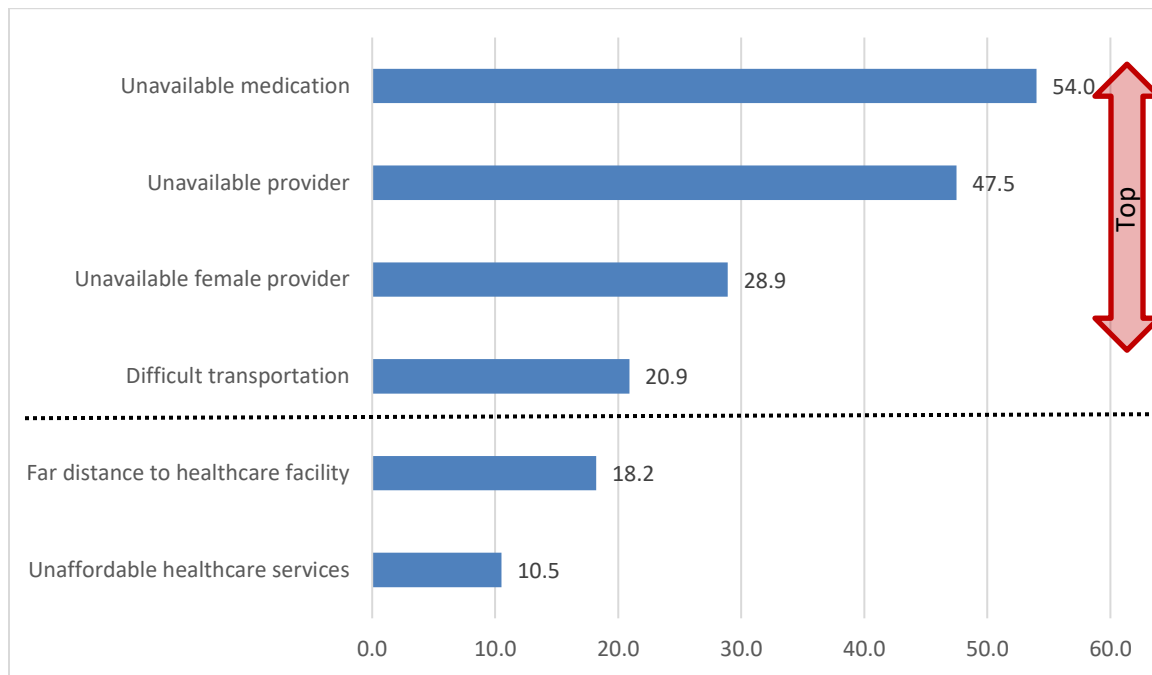
IV.2. Responsiveness of the Health System to the Unequal Needs of the Social Groups

Documenting inequalities in HS related SRH challenges provides solid evidence on the responsiveness of the health system to the unequal needs of the different social groups. This section provides evidence on the HS related SRH inequalities.

The following sections describe the HS performance and capacity distributions with respect to three social stratification – geographic location, wealth quintiles and gender norms. This is followed by a summary inequality measure to assess the magnitude of the HS inequalities. This section is an initial attempt to pave the road towards conceptualizing the links between the inequalities in HS determinants to the consequent SRH impact/outcomes previously presented.

IV.2.1 Geographic Inequalities in Health System Related Sexual and reproductive Health Challenges

- Each geographic region has specific HS features.
- Rural Upper Egypt carries the highest burden of inadequate HS performance and capacity
- Exceptions to this pattern includes the high prevalence of C-section deliveries and low coverage of tetanus vaccine which are prevalent in the Urban Governorates and Urban Lower Egypt.
- The top geographic HS performance inequalities include births occurring in the hands of unskilled providers, home deliveries, no postnatal checkup for women, no antenatal care services and family planning unmet need.
- The top geographic HS capacity inequalities include unaffordable healthcare and distant health care facilities

Geographic disparities in HS determinants are quite evident (Table 6). Each geographic region has specific HS features. Rural Upper Egypt carries the highest burden of inadequate HS performance and capacity with the exception of the high prevalence of C-section deliveries and low coverage of tetanus vaccine. The fact that explains the poor SRH impact and outcomes in this region.

In Urban Upper Egypt, there is insufficient ANC coverage and high rate of C-section deliveries. Furthermore, Urban Upper Egypt suffers from high proportion of unavailable provider, lack of medication and unaffordable healthcare.

Table 6: Geographic distribution in health system components in Egypt

	Urban gov.	Urban Lower Egypt	Rural Lower Egypt	Urban Upper Egypt	Rural Upper Egypt	Frontier gov.
Health system performance						
No contraceptive method used	37.4	37.5	35.9	41.1	53.3	45.0
Family planning unmet need	11.1	10.9	10.3	13.5	17.0	11.0
No antenatal care (≤one visit)	5.9	4.6	6.7	10.7	16.2	12.9
No regular antenatal care (<4 visits)	9.1	9.9	13.7	17.1	27.2	21.3
Birth not protected against tetanus	36.2	33.2	22.9	27.1	22.0	35.4
Home delivery	5.0	3.5	10.2	9.5	23.9	15.7
Birth not attended by skilled provider	2.6	1.9	5.6	5.6	16.9	10.8
Caesarean section delivery	62.0	70.6	57.8	50.2	35.9	41.1
No postnatal checkup	4.8	7	12.7	14.5	28.4	20.1
No HIV/AIDS comprehensive knowledge in females	91.7	91.8	95.3	88	95.8	95.9
No HIV/AIDS comprehensive knowledge in males	87.2	89.3	92.2	88.3	91.1	90.5
Never had clinical breast examination	95.5	96.7	98.4	97.1	99.6	96.0
Health system capacity						
Distant healthcare facility	11.4	12.6	17.1	17.4	25.3	24.0
Difficult transportation	13.1	15.0	20.0	20.6	28.4	29.1
Unavailable provider	36.9	37.9	44.1	51.7	59.5	51.8
Unavailable female provider	20.7	23.5	29.7	24.9	35.6	25.7
Unavailable medication	43.6	45.7	50.6	59.3	64.8	60.0
Unaffordable healthcare services	6.1	7.6	8.1	13.3	16.2	6.6

Despite that urban settings are expected to have better health care services, urban Governorates and Urban Lower Egypt suffer from very high proportion of C-section deliveries and low coverage with tetanus vaccine. Rural Lower Egypt is characterized by very low HIV/AIDS comprehensive knowledge in males and females.

The Frontier Governorates are characterized by very low HIV/AIDS comprehensive knowledge in females and lack of tetanus coverage. It is apparent that the Frontier Governorates suffer from inaccessible services as indicated with the high proportion reporting distant healthcare facilities coupled with difficult transportation and unavailable medication.

Assessing the levels of geographical inequalities shows that the highest HS geographic inequalities include all obstetric services whether during the antenatal, natal or postnatal period (Figure 16). The top on the list is the high uneven distribution of natal care with births occurring in the hands of unskilled providers, at home with no postnatal checkup for women, accompanied by inequalities in ANC services and FP unmet need.

In addition, birth not protected against tetanus, no contraceptive method use and C-section deliveries show moderate geographic inequalities. It is also evident that the prevention programs (lack of breast cancer screening and insufficient HIV/AIDS knowledge) are nationwide challenges with no significant geographic inequality.

Figure 16: Geographic inequalities in health system performance
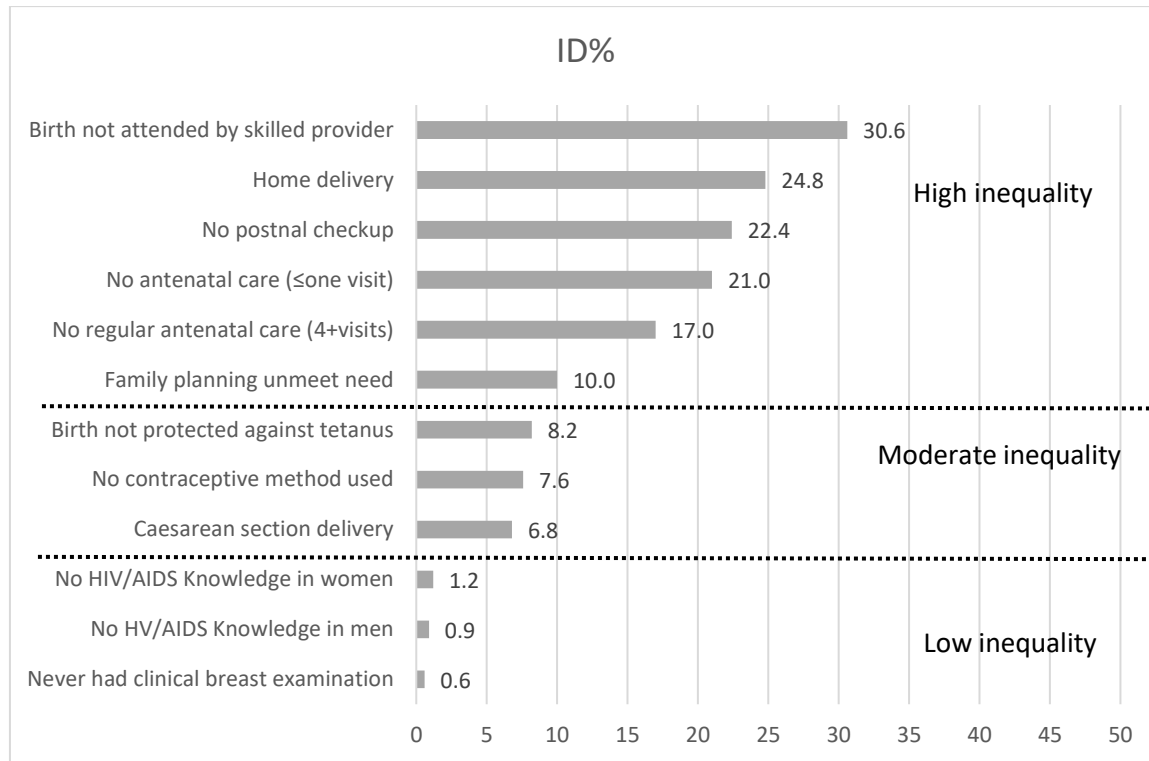
It is also clear that the health service geographic planning and resources need special attention (Figure 17). Distant health care facilities accompanied by difficult transportation and unaffordable healthcare are evident as high geographic HS inequalities. Furthermore, unavailable provider, unavailable female provider and unavailable medication are, also, of moderate geographic inequalities.

Figure 17: Geographic inequalities in health system capacity
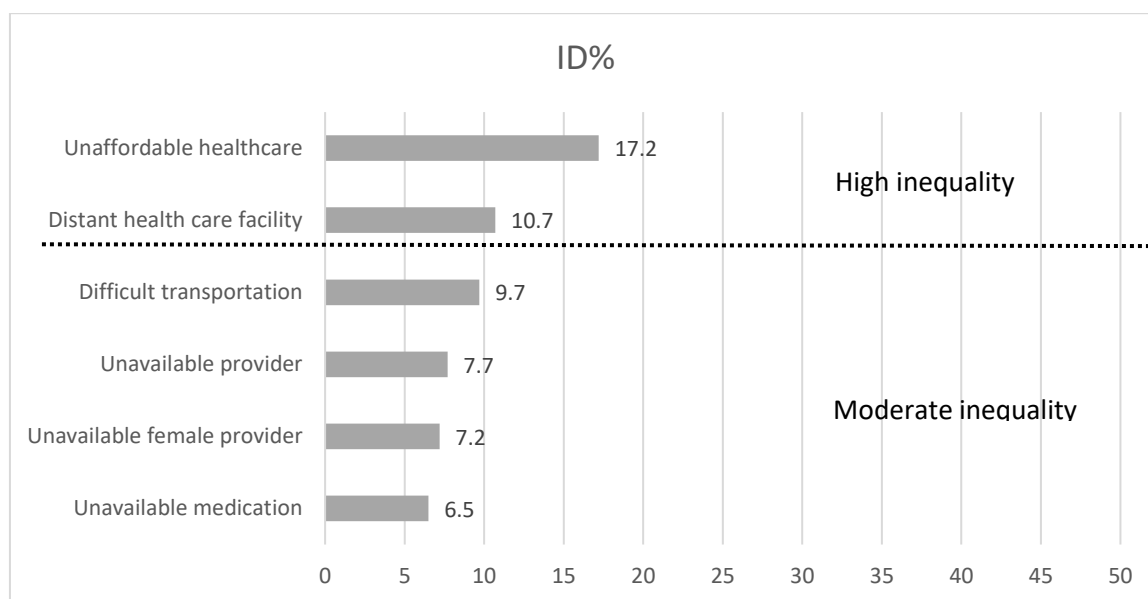
IV.2.2 Wealth Inequalities in Health System Related Sexual and Reproductive Health Challenges

- Access to sexual and reproductive healthcare services is generally least among the poorest quintile of the population
- The only exception is cesarean section deliveries and lack tetanus vaccination during the antenatal period which are more prevalent among the richest.
- The top wealth related HS performance inequalities include birth unattended by skilled provider, home deliveries, lack of antenatal care and postnatal checkup.
- The top wealth related HS capacity inequalities include distant and unaffordable healthcare services, as well as difficult transportation.

Access to SRH healthcare services is generally least among the poorest 20 percent of the population except for C-section deliveries and lack tetanus vaccination during the antenatal period (Table 7). C-section deliveries account for over two thirds of deliveries that occurred among the richest population in the 5years preceding the survey. This high proportion of C-section deliveries cannot be simply justified by the women's choice or explained by the failure of the ANC to detect risk pregnancies among the rich. There is a need for searching the underlying cause of such practice. Certainly, the work overburden, the low salaries, the shortage of healthcare providers might be among the many factors that explain the wide spread of this practice.

In addition, over one third of the richest women did not receive tetanus vaccination during ANC. There is no clear justification for this observation that needs further research. The successful EPI program and the shift towards facility-based deliveries, especially as Egypt is declared neonatal tetanus free country could be a potential explanation.

Table 7: Wealth distribution in health system related sexual and reproductive health in Egypt

	Poorest	Poorer	Middle	Richer	Richest
Health system performance					
No current contraception use	44.1	44.3	40.6	40.2	38.6
Unmet need	15.4	15.0	11.1	11.1	11.0
No antenatal care (≤one visit)	16.2	12.9	9.1	6.8	3.9
No regular antenatal care (<4 visits)	28.0	23.3	16.5	11.9	6.9
Birth not protected against tetanus	26.0	20.9	22.0	24.5	37.3
Home delivery	24.9	20.9	11.6	6.9	2.3
Birth not attended by skilled provider	17.6	14.1	6.5	3.5	1.0
Caesarean section delivery	38.0	41.8	52.9	59.4	67.2
No postnatal care	27.2	26.1	15.9	10.6	3.8
No HIV/AIDS comprehensive knowledge among women	97.6	95.8	93.7	93.2	88.8
No HIV/AIDS comprehensive knowledge among men	93.6	94.4	88.9	89.3	86.3
Never had clinical breast examination	99.4	99.0	98.6	97.7	95.2
Health system capacity					
Far healthcare facility	25.9	20.3	18.4	16.0	11.0
Difficult transportation	29.6	22.8	21.4	18.7	13.0
Unavailable provider	52.5	53.5	46.6	45.8	39.5
Unavailable female provider	33.5	31.0	32.2	26.8	21.0
Unavailable medication	58.9	59.4	53.8	53.7	44.5
Unaffordable healthcare services	17.6	12.8	9.0	8.5	5.5

The wealth-related HS inequalities point to the insufficient obstetric care and the family planning efforts (Figure 18). Birth unattended by skilled provider was on the top of the wealth-related HS inequality list with rCI% of around 30%. Wealth inequalities in home deliveries, lack of antenatal care and postnatal checkup are unacceptably high ranging from rCI% of 17.7% to 25.4%.

C-section deliveries, family planning unmet need and lack of tetanus vaccination show moderate wealth inequalities with rCI% ranging from 5.7 to 8.4%, while lack of contraceptive method use, lack of comprehensive HIV/AIDS knowledge and breast cancer screening are nationwide concerns with low wealth inequality (rCI% ranging from 0.6% to 2.1%).

Figure 18: Wealth inequalities in health system performance in Egypt
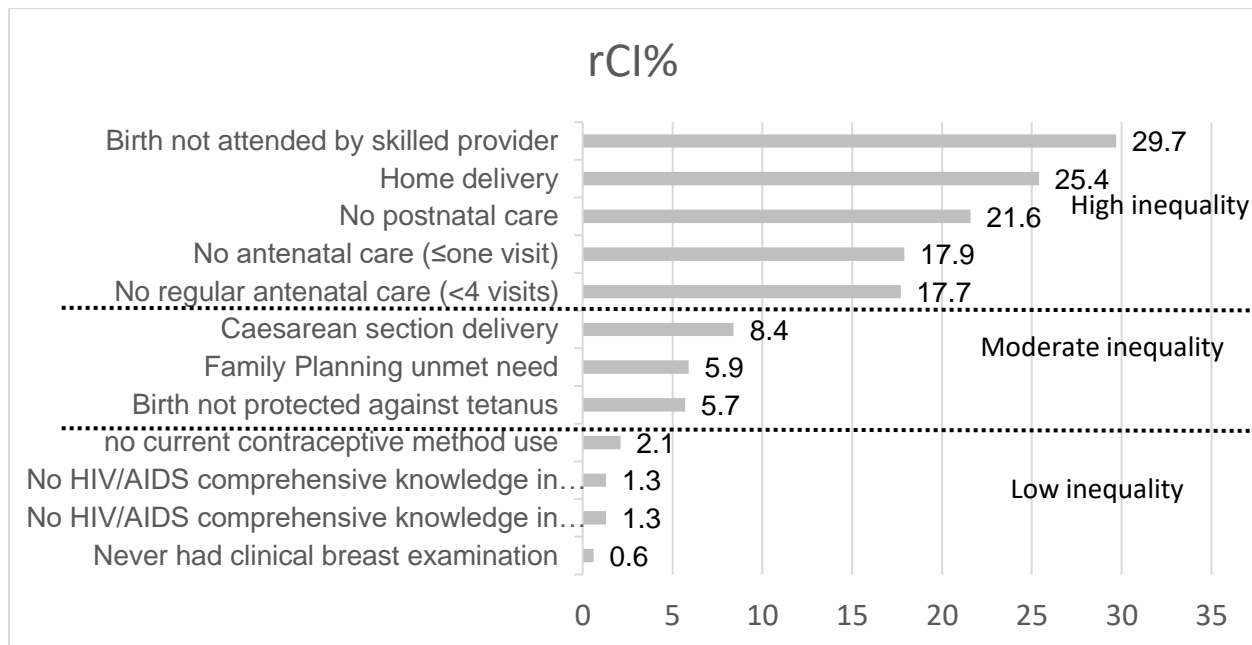
Wealth inequalities in health system capacity are also evident (Figure 19). The uneven distribution in health system capacity was reflected on the high wealth-related inequality in the ability of women to afford the cost of the healthcare services and access the distant healthcare facilities with difficult transportation

Figure 19: Wealth inequalities in health system capacity in Egypt
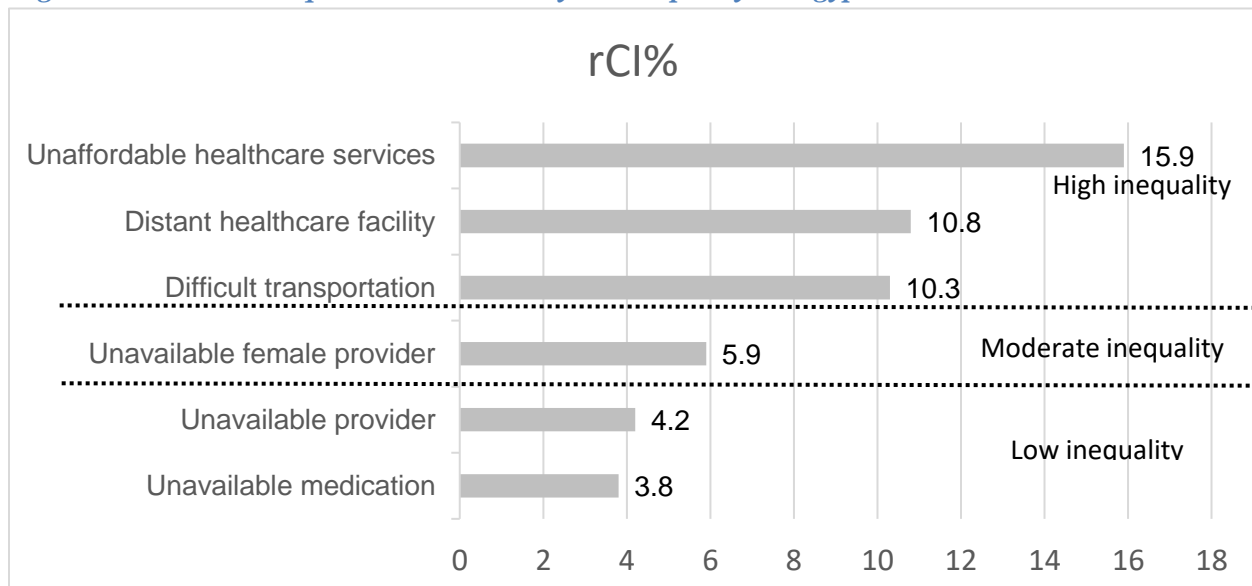
Lack of female provider showed moderate wealth inequality (rCI%= 5.9%) while inequalities in the availability service providers and medication were of low wealth inequality (rCI% of 4.2 and 3.8% respectively).

IV.2.3. Gender Inequalities in Health System Related Sexual and Reproductive Health Challenges

- The most conservative gendered cultural context suffers from the inadequacy of almost all health system determinants
- Exceptions can be observed in C-section deliveries, which are prevalent in the least conservative
- The conservative gendered cultural context suffers from the inadequacy of all health system capacity indicators with one exception is the unaffordability of health services which was more prevalence among the most conservative gendered cultural context.
- The highest gender-related HS performance inequalities include birth not attended by skilled provider, home delivery, no ANC, never had clinical breast examination, C-section deliveries, FP unmet need and birth not protected against tetanus.
- The magnitude of the gender-related HS capacity inequalities are high for unavailability of providers and female providers and was moderate for unavailability of medication, difficulty in transportation and unaffordability of the services.

The inequalities in the distribution of HS performance by gendered cultural context are significant (Table 8). The most conservative gendered cultural context suffers from the inadequacy of almost all HS determinants.

Table 8: Gender distribution in health system components in Egypt

	Most conservative	Conservative	Less conservative	Least conservative
Health system performance				
No current contraception use	56.1	40.8	41.5	41.8
Unmet need	14.8	7.3	8.2	7.2
No antenatal care (≤one visit)	14.9	10.3	8.7	4.7
No regular antenatal care (<4 visits)	24.9	16.2	14.1	8.1
Birth not protected against tetanus	26	20.9	22	24.5
Home delivery	23.3	13.2	5.5	2.5
Birth not attended by skilled provider	21.5	11.8	6.9	3.3
Caesarean section delivery	38.1	50.0	58.2	65.9
No postnatal care	39.7	44.0	44.7	41.9
No HIV/AIDS comprehensive knowledge among men	93.6	94.4	88.9	89.3
No HIV/AIDS comprehensive knowledge among women	97.6	95.8	93.7	93.2
Never had clinical breast examination	99.4	99	98.6	97.7
Health system capacity				
Distant healthcare facility	33.0	36.0	19.3	11.7
Difficult transportation	31.4	36.8	20.6	11.2
Unavailable provider	28.6	32.4	24.8	14.2
Unavailable female provider	29.4	34.5	23.6	12.5
Unavailable medication	29.1	32.1	24.3	14.5
Unaffordable healthcare services	36.3	34.8	17.7	11.6

The only exceptions included C-section deliveries which are more prevalent among the least conservative, as well as the distant healthcare facility and difficult transportation which are more prevalent among the conservative group. The unavailability of female provider appears to be an important barrier to access healthcare for all categories except the least conservative. The concern about the high prevalence of C-section is still raised among the least conservative gendered cultural context.

As shown in Figure 20, the high gender-related HS performance inequalities include birth not attended by skilled provider, home delivery, no ANC, never had clinical breast examination, C-section deliveries, FP unmet need and birth not protected against tetanus.

No current contraception use and no HIV/AIDS comprehensive knowledge in women are of moderate gender inequality. While the lack of HIV/AIDS comprehensive knowledge in men is nationwide problems, nearly evenly shared by all gender categories

Figure 20: Gender inequalities in health system performance in Egypt

rCI%

High inequality

Indicator	Value
Birth not attended by skilled provider	30.4
Home delivery	26.3
No regular antenatal care (<4 visits)	18.6
Never had clinical breast examination	18.0
Caesarean section delivery	17.5
No antenatal care (≤one visit)	16.1
Family planning unmet need	12.9
Birth not protected against tetanus	11.4
No current contraception use	9.4
No AIDS comprehensive knowledge in women	6.3
No AIDS comprehensive knowledge in men	3.0
No postnatal care	0.0

Moderate inequality

Low inequality

0.0   5.0   10.0   15.0   20.0   25.0   30.0   35.0

As shown in Figure 21, the indicators of HS capacity show high inequality (unavailable female provider and unavailable provider), moderate inequality (unavailable medication, unaffordability and inaccessibility of healthcare services,) or low inequality (distant health facility).

Figure 21: Gender inequalities in health system capacity in Egypt
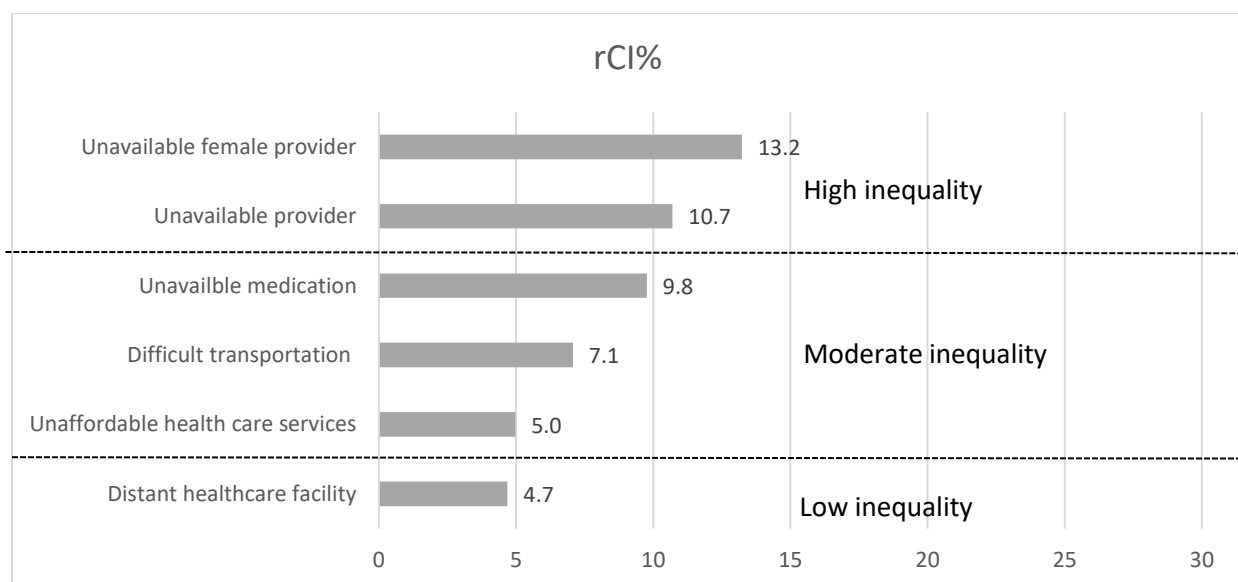
IV.3 Priority Health System Challenges vs. Priority Health System Inequalities

- Inadequate use of contraception, lack of AIDS comprehensive knowledge among women and men, and the unavailability of the medication are nationwide priorities with no inequalities
- Inadequate breast cancer screening, extensive C-sections, insufficient tetanus vaccination and difficulty in transportation to health facilities, the unavailability of providers and the unavailability of female provider are high priorities with inequalities on some stratifiers
- Inadequate ANC, skilled birth attendance and postnatal care coverages and home deliveries are low or average health priorities with large inequalities across some stratifiers

It is evident that the HS in Egypt has numerous challenges and is not always responsive to the SRH needs and the needs of the different social groups. As seen in Table 9, the HS faces three major types of challenges.

The first are nationwide challenges which scores amongst the highest priorities but there were no significant inequality by any of the selected stratifiers. On the health system performance, these challenges include inadequate use of contraception and lack of HIV/AIDS comprehensive knowledge among women and men. The FP intervention apparently does not achieve the required outcome, which necessitates evaluation and strengthening of the strategies and interventions. Lack of HIV/AIDS knowledge is a nationwide concern, which may contribute to the wide spread of the infection. The culture sensitivity and the intense stigma pose the greatest challenge to raising the population awareness towards infections transmitted by sexual route.

On the health system capacity, the first type of challenges is observed in the unavailability of the medication. The availability of services is certainly influenced by the insufficient financial resources.

The second type of challenges are those health system challenges that scores among the highest priorities and show some inequalities across certain stratifiers. Inadequate breast cancer screening, extensive C-sections and insufficient tetanus vaccination are nationwide health performance priorities with apparent inequalities across the gendered cultural context. For health capacity, the main priority is the difficulty in transportation to health facilities and the apparent inequality by wealth and the poor suffering more. Similarly, the unavailability of providers and female providers in particular were among the nationwide priorities and their inequality was high by the gendered cultural context where the conservative localities are suffering more than the others.

Table 9: Key findings of priority health system challenges in Egypt

	Top Challenges (≥20%)	Inequalities		
		Geographic (ID%≥10%)	Wealth (rCI%≥10%)	Gender (rCI%≥10%)
Health system performance				
No current contraceptive method used	■			
Family planning unmet need		Rural Upper Egypt		Most conservative
No antenatal care (≤one visit)		Rural Upper Egypt	Poor	Most conservative
No regular antenatal care (<4 visits)		Rural Upper Egypt	Poor	Most conservative
Birth not protected against tetanus	■			Most conservative
Home delivery		Rural Upper Egypt	Poor	Most conservative
Birth not attended by skilled provider		Rural Upper Egypt	Poor	Most conservative
Caesarean section deliveries	■			Least conservative
No postnatal care		Rural Upper Egypt	Poor	
No HIV/AIDS comprehensive knowledge in women	■			
No HIV/AIDS comprehensive knowledge in men	■			
Never had clinical breast examination	■			Most conservative
Health system capacity				
Distant healthcare facility		Rural Upper Egypt Frontier Governorates	Poor	
Difficult transportation	■		Poor	
Unavailable provider	■			Conservative
Unavailable female provider	■			Conservative
Unavailable medication	■			
Unaffordable healthcare		Rural Upper Egypt	Poor	

The third type include low or average level priorities but show high levels of inequalities across some stratifiers. On the health system performance dimension, these include home delivery, inadequate ANC and skilled birth attendance, where Rural Upper Egypt resident, the poor and those

living in the most conservative cultural context are suffering the most. No postnatal care and home deliveries were more common among the poor and residents of Rural Upper Egypt than other social strata.

On the capacity dimension, unaffordable healthcare was more prevalent among residents of rural Upper Egypt and the poor. Healthcare facilities were distant from reach in Rural Upper Egypt, the Frontier Governorates and among the poor.

Part Five: The Relative Importance of the Distribution of Different forces: A Decomposition Analysis

> - Limited resources and the differences in the relative weight of the inequality of stratifiers in producing health inequality by the specific aspect of health investigated calls for prioritizing the distribution of these different stratifiers.
> - The decomposition analysis answers the question how inequality in a health indicator can be related to inequality in its determinants.
> - The decomposition analysis can support in guiding policy makers in the prioritizing the social determinants that achieve the highest gain in tackling health inequalities.

The report recognizes the importance of mainstreaming equity in the four domains specified earlier to ensure that the distribution of different social determinants is a fair distribution. Knowing that the different forces of socio-economic conditions (wealth as a proxy), geographic attributes (region as proxy) as well as gender norms and health system responsiveness interact with each other's producing a much higher impact on SRH than the separate impact of each force. **Hence, the general policy recommendations are to work on all these fronts and to adopt an integrated transformative approach to change the inequitable distribution of social stratifiers.**

However, given the limited resources and the recognition that the relative weight of the inequality of the different stratifiers in producing health inequality differs by the specific aspect of health under consideration, there may be a need to prioritize the distribution of one type of stratifier than the other when a particular measure of health is targeted.

For example, it may be true that the inequality in physical health is more affected by inequality in environmental exposures and health system services, while inequality in mental health is more affected by gendered norms. In the first case, the action on environmental context as well as the fairness of policies shaping environmental context should take precedence. In the second, the targeting of actions on social norms and policies to address their distributions would be prioritized.

The following section provides a tool and an illustration on how for a specific indicator and particular stratifier, the relative weight of the different social determinants can be assessed. Once the relative weight of the key determinants are assessed, policies and actions can be guided by the scientific evidence.

V.1. Introducing the Tool (Decomposition Analysis)

The decomposition analysis build on the efforts of health modeling approach. The health modeling approach enable researchers and policy makers to identify the main social determinants that relate and define the level of the health indicators. A main output of health modeling is the identification of the most effective determinants and the value that quantify the changes in the health indicators with changes in each effective determinant.

Based on this model, the decomposition analysis moves one-step further by exploring how inequality in the health indicator can be related to inequality in its determinants (Figure 22)[c].

Figure 22: Decomposition of the SRH inequalities into their social determinants inequalities
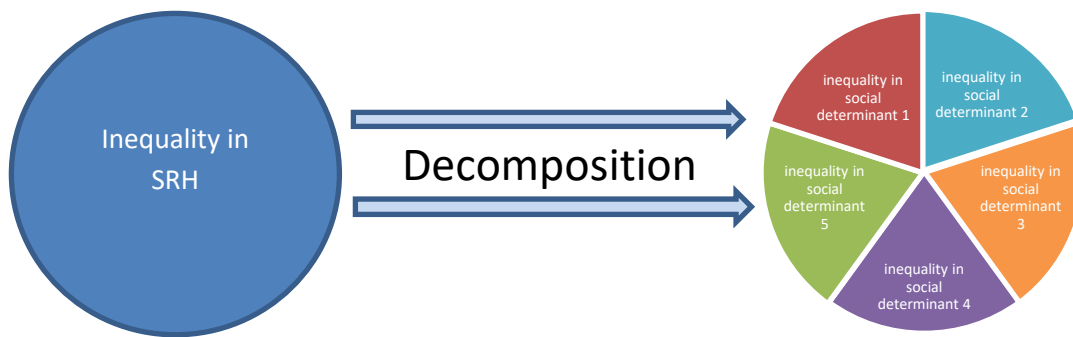
Using the health model and the defined social determinants, the concentration index of the SRH indicator across a specified stratifier can be decomposed into shares for the different social determinants. Analytically, these shares are composed of two important factors.

- The elasticity, which is defined in the terms of the changes in the SRH indicators relative to changes in the social determinant
- The inequality in the social determinant defined in the unfair distribution of the social determinant according to the same stratifier used for the health indicator

Inequality in SRH indicator= Sum (Shares for each (SD))

Inequality in SRH indicator=Sum (elasticity (SD) X inequality in (SD))………. (1)

According to equation (1), the decomposition analysis can support in guiding policy makers in the prioritizing the social determinants that achieve the highest gain in tackling health inequalities. It also allows the identification of the proper interventions through

- Mitigate the effect of the elasticity through deleting the relationship between the social determinant on the SRH health indicator,
- Tackling the inequality in the social determinant and achieving equality in the determinant across the social groups

Accordingly, policy makers have to decide among the different options of interventions to reduce the inequalities due to that social determinant.

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[c] For statistical formulation of the decomposition analysis, see annex 6.

V.2. Illustrations on Use of Decomposition analysis in Prioritizing Social Stratifiers

- Two illustrations on the use of the decomposition analysis revealed the differences in the relative weight of the distribution of social stratifiers in producing health inequality in the specific health indicators
- Determinants are usually classified in either contributors to inequality or contributors to equality.
- Both types of contributors can identify the main policy entry points for interventions

As alluded previously, the decomposition analysis traces inequalities in SRH indicator to inequalities in their proximate and structural determinants. The following two subsections introduces two illustrations that elaborate the use of decomposition analysis in guiding policies. For these two illustrations, two of SRH indicators that are identified as high SRH inequality priorities, namely multiparity and infant mortality are used. The illustrations decompose the wealth-based inequality in these two indicators into shares for each of their main determinants and relating SRH indicators wealth- based inequalities to their determinants wealth-based inequality.

In the current two illustration four main social stratifiers are used, namely geographic region, gendered cultural context index, environmental context index, and health system index. The former indexes are the same indexes used in the previous analytical parts. The latter two indexes are constructed to reflect the environmental and health system attributes of the locality in which women live.

The *Environmental context index* captures the level of developmental services with particular emphasis on infrastructure within the locality in which women live. This is measured in term of the proportion of household with access to improved sanitation facility. Similar to the gendered context, the localities were classified according to this index into quartiles indicating four broad categories ranging from low service, moderate service, high service and the highest service localities.

The *Health service index* assesses the level of the health services in the localities in which women live. Since health services differ for the different SRH indicators, this index is constructed from components that respond for the SRH indicator. For example, for multiparity, health service index is constructed as a summation index of three proportions. These proportions are 1) the proportion of women who use contraceptive, 2) the proportion of women who has no unmet need and 3) the proportion of women who receive postnatal care. For infant mortality, health service index is constructed as a summative index at the level of locality of five proportions. These proportion are 1) the proportion receiving antenatal care, 2) the proportion delivering at health facility, 3) the proportion of women have no problem with the distance to healthcare facility, 4) the proportion of women have no problem with transportation to healthcare facility, and 5) the proportion of women have no problem with provider in healthcare facility. For simplicity, for all independent indexes

used, the localities were classified into quartiles indicating four broad categories namely ranging from the worst off to the best off category across the level of the index

V.2.1. Decomposing wealth-based multiparity inequality

- Main contributors to wealth inequality in multiparity are,
  - Early marriage: Early married women are more likely to have multiparity. They are also more concentrated among the poor. These results increase the probability of multiparity among the poor and hence increase the inequality in multiparity by wealth.
  - Living in locality with the best supportive health system for limiting multiparity. Living in these localities decreases the probability of multiparity, but poor women are less concentrated in these localities. These results increase the probability of multiparity among the poor and hence increase the inequality in multiparity by wealth
  - Living in locality with the least conservative gendered context. Living in these localities decreases the probability of multiparity. Poor women are less concentrated in these localities. These results increase the probability of multiparity among the poor and hence increase the inequality in multiparity by wealth
- Main contributors to wealth equality in multiparity are
  - Living in Urban Upper Egypt. Living in this region increase the probability of multiparity but there is low concentration of poor in this region. These results decrease the probability of multiparity among the poor and hence decrease the inequality in multiparity by wealth
  - Living in rural Lower Egypt. Living in this region decreases the probability of multiparity but there is high concentration of poor in this region. These results decrease the probability of multiparity among the poor and hence the decrease inequality in multiparity by wealth

In this analysis, multiparity is postulated to be determined with three main proximate determinants namely women's education, husband's education and age at first marriage and the four social forces assessed in four indexes; namely environmental context index, gendered cultural context index, health system index and geographical region. Table 10 shows that many determinants are significantly related to multiparity including current age, age at first marriage, living in locality with good or best health system, with good or best environmental context, least conservative gendered cultural context and living in Frontier governorate.

The marginal effects, similar to the interpretation of linear regression, show the amount of change in the probability of having multiparity by the change in the social determinant by one unit. For example, the probability of having 5 or more live births increases with marrying at age less than 18 years by 0.096 than those marrying at age 18 years and older. Table 10 shows that the probability of having 5 or more live births increases by age of the respondents, with marrying at age 18 and living in rural and urban Upper Egypt and Frontier governorates. It decreases by all the other social determinants compared to their reference categories.

Table 10 Decomposing wealth based inequality in multiparity

Social Determinant	Marginal effect of SD		Mean value of SD	Elasticity of SD	CI of SD	Contribution of SD	% share
Age							
25-29	0.382	***	0.215	0.617	0.030	0.019	-9.09
30-34	0.515	***	0.190	0.736	0.004	0.003	-1.55
35-40	0.593	***	0.163	0.728	0.012	0.009	-4.44
40+	0.647	***	0.262	1.272	-0.009	-0.012	5.86
Age at first marriage <18	0.096	***	0.276	0.200	-0.251	-0.050	24.60
Respondent with secondary education and more	-0.035	***	0.650	-0.170	0.162	-0.028	13.52
Husband with secondary education and more	-0.009		0.680	-0.047	0.110	-0.005	2.55
Health system							
Bad	-0.003		0.338	-0.007	0.046	0.000	0.15
Good	-0.024	*	0.168	-0.030	0.069	-0.002	1.01
Best	-0.059	***	0.234	-0.103	0.420	-0.043	21.16
Environmental context							
Bad	-0.002		0.302	-0.004	-0.210	0.001	-0.42
Good	-0.039	***	0.246	-0.072	0.116	-0.008	4.08
Best	-0.034	*	0.221	-0.057	0.642	-0.037	17.91
Gendered-cultural context							
Conservative	-0.013		0.336	-0.034	-0.189	0.006	-3.13
Less conservative	-0.010		0.240	-0.017	0.275	-0.005	2.36
Least conservative	-0.047	***	0.176	-0.063	0.623	-0.039	19.15
Geographic Region							
Urban Lower Egypt	-0.022		0.106	-0.017	0.578	-0.010	4.88
Rural Lower Egypt	-0.018		0.387	-0.052	-0.221	0.011	-5.60
Urban Upper Egypt	0.029		0.111	0.025	0.468	0.011	-5.62
Rural Upper Egypt	0.030		0.261	0.059	-0.439	-0.026	12.77
Frontier gov	0.039	*	0.009	0.003	0.106	0.000	-0.14

These relationships are reflected in the elasticity for each determinant as the signs of the marginal effect indicate the direction of the relationship between multiparity and the different social determinants.

The concentration indexes for the different social determinants highlight important wealth-based inequalities in these determinants.   For example marrying at age less than 18 years exhibits large

negative concentration index (CI=-0.251), which is interpreted as high concentration of this age at first marriage among poor women. Similar wealth-based inequality patterns are also observed among women living in localities in characterized with conservative gendered cultural context and bad environmental context and those residing in rural Lower and Upper Egypt. In contrast, having secondary or more education, marrying a secondary or more educated husband, living in localities with best health system, good or best environmental context, less or least conservative gendered cultural context and residing in urban Lower and Upper Egypt show least concentrated among the poor population as indicated by the large magnitude and the positive signs of the concentration indexes of these determinants.

Finally, the interaction between the elasticity of the social determinant and its wealth-based inequality defines its contribution in explaining wealth -based inequality in multiparity (figure 23). Focusing on the positive shares, marrying at age less than 18 years exhibits the highest share in explaining wealth-based inequality in multiparity (24.6%). This high share is product of high positive elasticity of this age at marriage with the probability of multiparity (elasticity =0.20) and high concentration of early marriage among poor women (CI=-0.251). As a result, poor women continue to have multiparity. Living in localities with best health system was negatively related to having multiparity as indicated with the negative marginal effect and positive elasticity. This locality is also characterized with very low concentration of poor women. The product of the interplay between these two factors is small numbers of poor women living in localities with health system that discourages multiparity and a high share in explaining the inequality of multiparity (21.2%).

These two determinants are followed by living in the least conservative gendered cultural context locality, which shows a share of 19.1% and living in a locality with the best environmental context, which accounts for 17.9% of the inequalities in multiparity.

In contrast, the negative signs shares are social determinants that promote equality. For example, living rural Lower Egypt exhibits a share of -5.6%. This is mainly attributed to the interaction of the negative elasticity indicating decrease in the probability of multiparity with living in rural Lower Egypt (-0.052). The negative concentration index indicates high concentration of poor women living in rural Lower Egypt (-0.221). The final product is a large number of poor women living in a region that promote lower levels of parity and this has the impact of decreasing wealth based inequality among the poor.

Figure 23: Shares of the different social determinants to wealth based inequality in multiparity
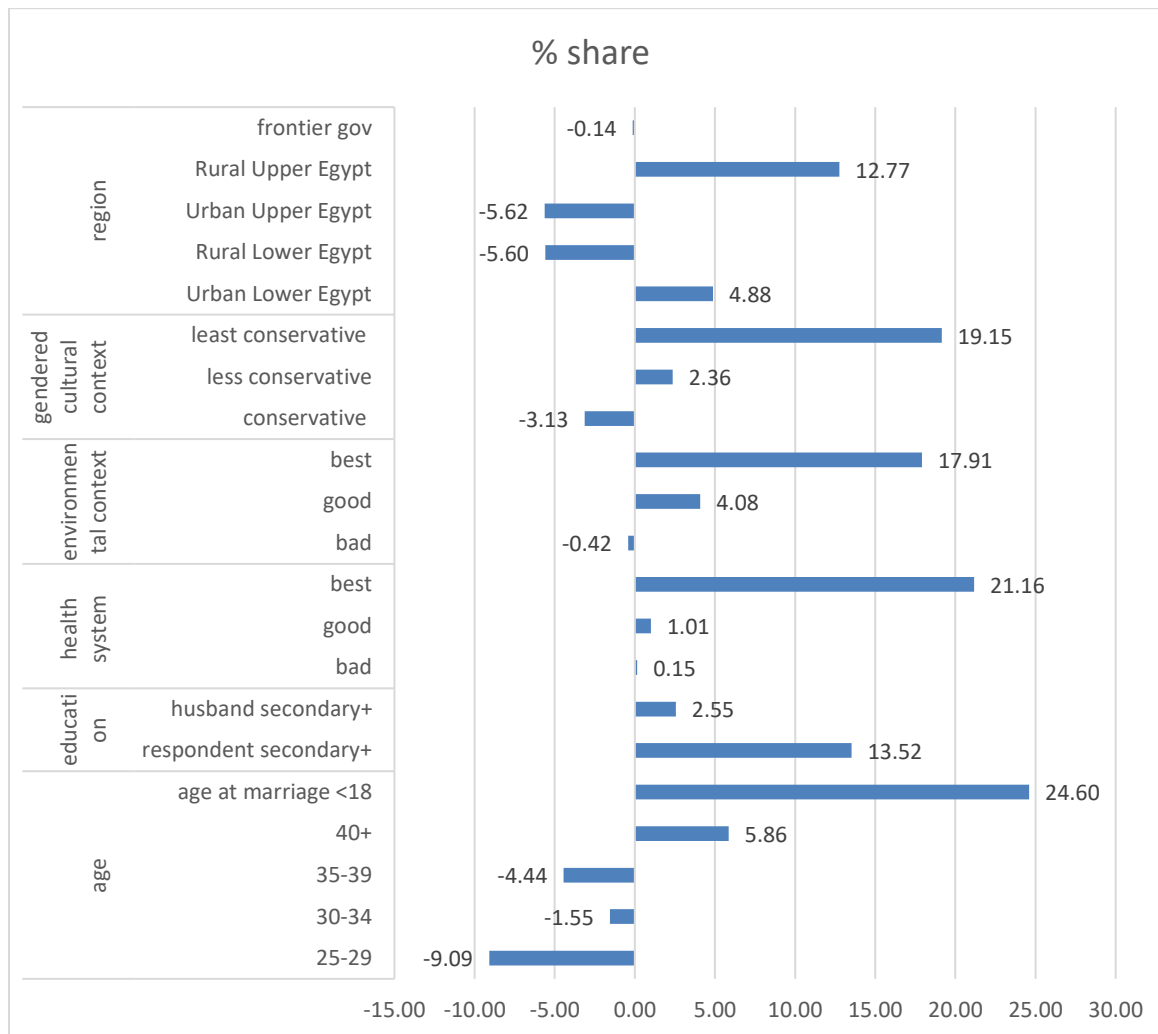
The main question how does the policy makers can use these results. For social determinants with positive shares, policy makers needs to work on either lowering or mitigating the effect of social determinant on multiparity, tackling its wealth based inequality or work on both fronts. For example, the case of early marriage that exhibits the highest share in inequalities in multiparity, the policy maker either have to delete its negative elasticity on multiparity or to work on tackling the wealth-based inequality in early marriage through tackling early marriage among poor women. In other words, decrease the concentration of poor women in marrying in ages less than 18 years.

For those social determinants with negative shares, the policy makers can enhance the pro-poor inequality by increasing the concentration of the poor in the localities or social categories that negatively affect the probability of multiparity. For the case of living in rural Lower Egypt that exhibits a negative share, the policy recommendation is increase the concentration of poor women in these localities or identify the criteria of living in rural Lower Egypt that decrease the probability of multiparity in this region.

V.2.2. Decomposing wealth based Infant mortality inequality

- Main contributors to wealth inequality in infant are,
  - Living in localities with best environmental context: Living in these localities decreases the probability of infant mortality, but poor infant are less concentrated in these localities. These results increase the probability of infant mortality among the poor and hence increase the inequality in infant mortality by wealth
  - Living in urban Lower Egypt. Living in this region decreases the probability of infant mortality, but poor infant are less concentrated in this region. These results decrease the probability of infant mortality among the poor and hence increase the inequality in infant mortality by wealth
  - Living in locality with the least conservative gendered context. Living in these localities decreases the probability of infant mortality. Poor women are less concentrated in these localities. These results increase the probability of infant mortality among the poor and hence increase the inequality in infant mortality by wealth
- Main contributors to wealth equality in infant are
  - Living in rural Lower Egypt. Living in this region decreases the probability of infant mortality but there is high concentration of poor in this region. These results decrease the probability of infant mortality among the poor and hence the decrease inequality in infant mortality by wealth

In this analysis, we adopt Mosley and Chen (1984) framework for child survival[37]. The framework postulates that child death is determined by socioeconomic maternal attributes, environmental context, nutrient attributes and the four social forces assessed in the four indexes, environmental context index, gendered cultural context index, health system index and geographical region. Table 11 shows that only three attributes was significantly related to infant death, giving birth at age <20, risky birth interval (less than 24 months), and risky birth weight.

The marginal effects, similar to the interpretation of linear regression, show the amount of change in the probability of an infant death by the change in the social determinant by one unit. Accordingly, the probability of infant death increases by 0.012 with giving birth at age <20, by 0.016 for giving birth with 24 month of previous birth and 0.017 for risky birth weight.   These relationships are reflected in the elasticity for each determinant as the signs of the marginal effect indicate the direction of the relationship between infant death and   the different social determinants.

The concentration indexes for the different social determinants highlight important wealth-based inequalities in these determinants.   For example giving birth at ages less than 20 years exhibits large negative concentration index, which indicates high concentration of giving birth at these ages among poor women.   Similar wealth-based inequality patterns are also observed for living in bad environmental context, bad gendered cultural context and living in rural Lower and Upper Egypt. In contrast, having secondary education, living in localities with best health system, best environmental context, less or least conservative gendered cultural context and living in urban Lower and Upper Egypt were less concentrated among the poor as indicated with the positive sign and large magnitude of the concentration indexes of these determinants.

Table 11 Decomposing wealth based inequality in infant mortality

	Marginal effect of SD		Mean value of SD	Elasticity of SD	CI of SD	Contribution of SD	% share
Family attributes							
Mother age at birth							
<20 years	0.012	***	0.070	0.052	-0.161	-0.008	7.500
>35 years	0.003		0.093	0.018	-0.054	-0.001	0.864
Respondent secondary	0.000		0.705	0.012	0.114	0.001	-1.215
Husband secondary	0.001		0.724	0.031	0.070	0.002	-1.928
Child attributes							
Risky birth interval<24 months	0.016	***	0.101	0.097	-0.098	-0.009	8.544
Birth order	-0.001		2.381	-0.181	-0.068	0.012	-11.175
Risk weight at birth	0.017	***	0.231	0.239	-0.038	-0.009	8.216
Female	0.000		0.442	0.005	-0.001	0.000	0.004
Health system							
Bad	-0.003		0.302	-0.046	0.003	0.000	0.131
Good	-0.002		0.220	-0.032	-0.086	0.003	-2.449
Best	-0.002		0.272	-0.026	0.333	-0.009	7.700
Environmental context							
Bad	0.001		0.302	0.010	-0.182	-0.002	1.723
Good	-0.007		0.246	-0.107	0.075	-0.008	7.177
Best	-0.009		0.221	-0.120	0.614	-0.074	66.729
Gendered –cultural context							
Conservative	-0.001		0.336	-0.025	-0.109	0.003	-2.458
Less conservative	0.003		0.240	0.037	0.227	0.008	-7.508
Least conservative	-0.003		0.176	-0.037	0.516	-0.019	17.025
Region							
Urban Lower Egypt	-0.006		0.106	-0.040	0.591	-0.024	21.227
Rural Lower Egypt	-0.007		0.387	-0.152	-0.126	0.019	-17.355
Urban Upper Egypt	-0.001		0.111	-0.004	0.309	-0.001	1.001
Rural Upper Egypt	-0.001		0.261	-0.009	-0.434	0.004	-3.501
Frontier gov	-0.010		0.009	-0.005	-0.051	0.000	-0.250

Finally, the interaction between the elasticity of the social determinant and its wealth-based inequality defines its contribution in explaining wealth -based inequality in infant death. Focusing on the positive shares, it is clear that living in the best environmental context localities is exhibiting the highest share in explaining wealth bases inequality in multiparity (66.7%). This high share is attributed to the fact that the elasticity for the best environmental context has the impact of decreasing the probability of infant death (elasticity =-0.12), while these locality is characterized by less concentration of poor women in them (CI=0.614). As a result, poor women continue to have infant death. Similar explanation is valid for living in urban Lower Egypt and least conservative gender cultural context in which their shares account for (21. 2%) and (17.0%) respectively.

In contrast, the negative signs shares are social determinants that promote equality. For example, the highest negative share was accorded to living rural Lower Egypt (-17.4%). This is mainly attributed to the interaction of the negative elasticity indicating decrease in the probability of infant death with living in rural Lower Egypt (-0.007) and the negative concentration index indicating that there is high concentration of poor women living in this region (-0.126). The final product is large number of poor women in a region that promote lower levels of parity and this has the impact of decreasing wealth-based inequality among the poor.

Figure 24: Shares of the different social determinants to wealth based inequality in infant mortality
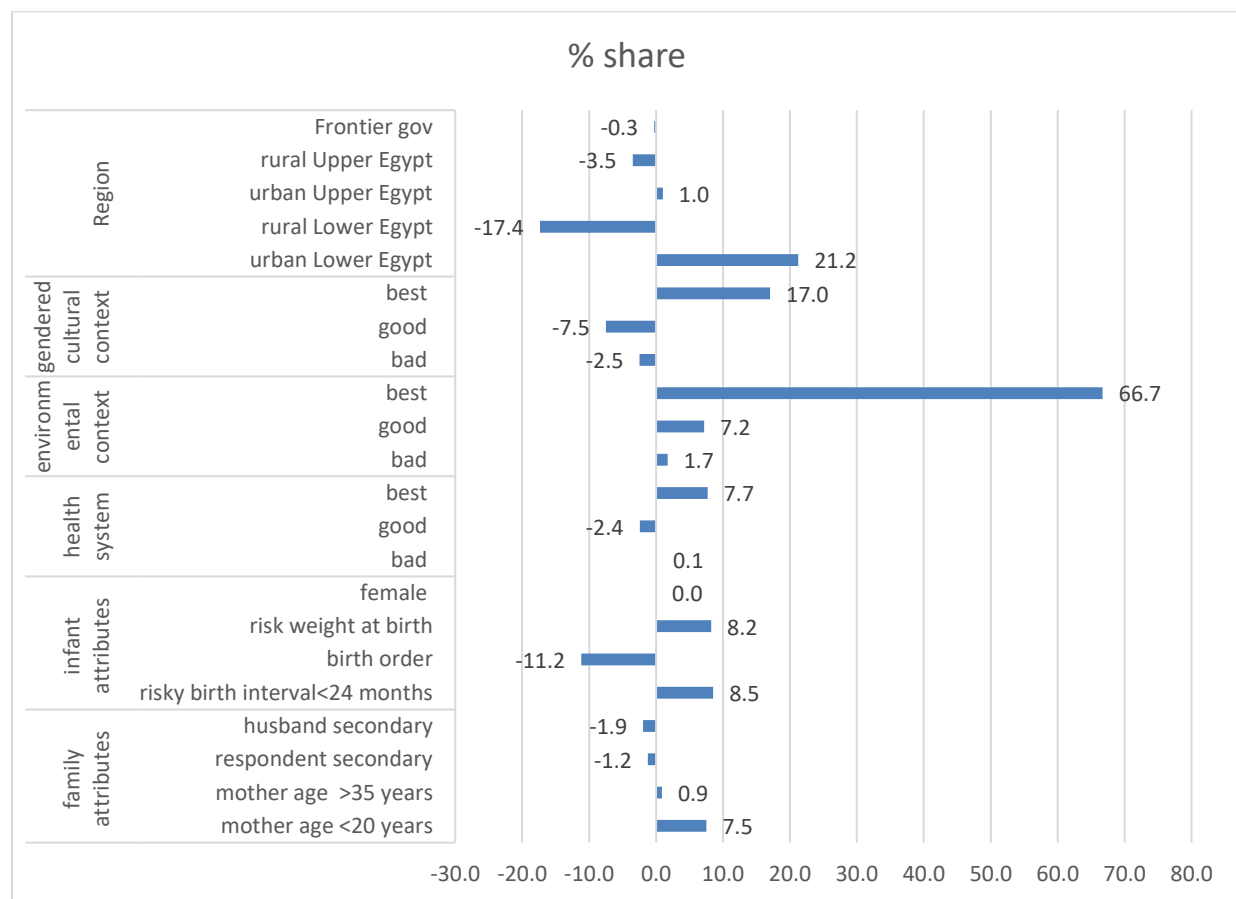
The main question how does the policy makers can use these results. For social determinants with positive shares, policy makers needs to work on either lowering or mitigating the effect of social determinant on infant death, tackling its wealth based inequality or work on both fronts. For example, the case of best environmental context that exhibits the highest share, the policy maker has either to delete its negative elasticity on infant death which is a unrealistic policy recommendation or to work on tackling the wealth-based inequality in localities with best environmental context. In other words, increase the concentration of poor women in these localities or provide best environmental services in localities with high concentration of poor women.

For those social determinants with negative shares, the policy makers can enhance the pro-poor inequality by increasing the concentration of the poor in the localities or social categories that negatively affect the probability of infant death. For the case of living in rural Lower Egypt that exhibits a negative share, the policy recommendation is increase the concentration of poor women in these localities or identify the criteria of living in rural Lower Egypt that decrease the probability of infant death in this region.

Part 6: Fairness of the Structural Determinants and Policy Implications

VI.1. The Fairness of the Structural Determinants

The health status in general is shaped by the interaction of socio-economic conditions, health system forces and other social forces as well as individual level predispositions and behaviors. The road to improving health requires a combination of:

- Socio-economic development policies.
- Improved financing and effectiveness of health system.
- Informed healthy practices by individuals supported by community level and contextual forces.

The road to improving SRH in particular acts through the same previous blocks of determinants. However, as discussed earlier, gender norms and women status are known to occupy a central place due to their strong impact on risky sexual and reproductive health behaviors and differentiated access to SRCH services. Also the comprehensiveness of sexual and reproductive health services is another key contributor to SRH.

As the previous parts of this report demonstrate, this approach while proven successful to improving some of the overall SRH indicators, yet it has many limitations. Particularly, these improvements were not equally shared among different social groups and, in some cases, it led to widening the inequality gap among the different social groups.

This report demonstrated the significant differences in SRH conditions within the social stratifiers of: geographic regions, wealth, gender norms. It also demonstrated the unfairness of health system components in terms of their unresponsiveness to differentiated needs within the stratifiers of geographic region, wealth, gender norms.

The recognition of inequalities across social stratifiers is not new. The approach for dealing with such inequalities is mainly to improve health services for the most disadvantaged complemented with some social/economic/gender based targeted interventions.

The question posed here relate to the fairness of structural determinants producing social stratification and also influencing the responsiveness of the health system. The unfairness of these structural determinants moves the discourse from inequality to inequity, and adds an ethical imperative to the need for policies and actions.

According to the SDH framework, discussed in part two of this report, the root causes of health inequalities should be traced to their structural determinants. These structural determinants are

defined as the socioeconomic and political context that shape the social stratification and define individuals' social position within the society.

According to Solar and Irwin (2010)[38], this context includes at least six main domains. These domains are "(1) governance in the broadest sense with particular emphasis on accountability/ transparency and participation of the different stakeholders in the society; (2) macroeconomic policy, including fiscal, monetary, balance of payments and trade policies and underlying labor market structures; (3) social policies affecting factors of social welfare; (4) relevant public policy such as education, medical care, water and sanitation; (5) culture and societal values; and (6) epidemiological conditions. These factors are shaping the societies ability to (re)distribute material resources among their members.

The question that is posed in this part is whether, within each of these six factors, the policies and actions are succeeding in serving: achievement of a **FAIR** distribution of resources, opportunities, services as well as **FAIR** distribution of power relations, inclusiveness and voice among social groups. It also investigates whether policies and actions aim to change the environment of behaviors to enable those in disadvantaged positions to adopt choices to improve their lives, including their health.

In terms of the SRH inequality challenge and the four determinants investigated (geographic distribution, distribution of wealth, gender stratifiers and the responsiveness of health system), the question is rephrased as follows: Within each of the six domains of structural determinants.

- Are policies and actions succeeding in serving the achievement of a **FAIR** distribution of resources, opportunities, services as well as **FAIR** distribution of power relations, inclusiveness and voice among the three stratifiers of geographic, wealth, and gender norms, classifications and within health system services and capacities?
- Are policies and actions aiming to change the environment of behaviors to enable those in disadvantaged positions (particularly those in rural upper Egypt, poorest, and most conservative categories, as well as those receiving lowest quality health system services) to adopt choices to improve their sexual and reproductive health conditions.

The following preliminary analysis suggests that there are many limitations on these fronts.

In terms of first key factor of **governance**, the concern with inequitable distribution of health is firmly placed as a pillar of development. SDG goal 10 is but one expression of this.

The commitment to fairness in society and to the impact on fairness on health can not be confined to a national vision and endorsements of international conventions and goals. Such commitment can only be demonstrated through the existence of an information system for health equity and its systematic utilization. Such a system should allow measuring and monitoring health inequality as well as tracing the links between observed inequalities and fairness of structural forces.

It should be noted that part two of this report showed that at the level of political discourse and also international commitments the concern with SRH ant the fairness of structural forces is evident.

Part three of this report showed that the commitments to SRH allowed a good evidence base covering key dimensions of SRH. This evidence base while quite rich is not fully comprehensive and can benefit from additional pieces of information. Also, the evidence base while allowing the measurement of inequality within some key stratifiers, yet does not cover many dimensions of inequality.

The key concern in the existing knowledge base is in its utilization. The fact is that no serious attempts have been made to link the inequalities to their structural determinants. Clearly, the lack of interest and lack of data are self-reinforcing.

To our mind, the current report may be the only one that systematically emphasized the structural frame and adapted it to SRH. This is a first much needed step but **much more is needed on the knowledge and research fronts to support equity prioritization.**

Clearly, strengthening the information system for health inequality and the capacity to provide the evidence base for investigating differentiated impact of public policies on social stratification is very much needed to support the governance pillar of fairness and nondiscrimination.

More importantly, good governance demands giving the highest priority to addressing any demonstrated inequity through adopting a corporate responsibility and an accountability process. Indeed, part three of this report demonstrated that the challenge of inequality is real.

The concern with inequality indicates that another very much needed support to the governance pillar is the **institutional structure and financial resources capable of managing and implementing the whole of government responsibility and accountability process to health inequality.**

Turning to the remaining five domains (macro-economic policies; social welfare policies; relevant public policies such as those, pertaining to social resources (education) and medical care and environment (water), as well as cultural and societal values), the following discussion provides some evidence pointing to the need to ensure fairness within these domains.

The inequality of SRH among **geographic regions** is clearly manifesting the differences in resources and services allocated by region.

Table 12 also demonstrates the variability and specificity of the type of disadvantage among different regions.

Table 12: Inequalities in the geographic attributes in Egypt

	Urban gov.	Urban Lower Egypt	Rural Lower Egypt	Urban Upper Egypt	Rural Upper Egypt	Frontier gov.
Percent households with shared sanitation facility	1.2	0.6	1.5	1.3	4.7	0
Percent households with inappropriate water treatment	85.7	82.8	90.3	88.8	94.6	80.9
Percent households with poorest population	0.5	2.7	22	6.1	40.8	21.9
Percent of uneducated women	11.9	11.9	23.3	17.8	38.6	22.9
Percent of unemployed women	83.4	77.1	82.8	82.2	89.1	81.4

Source: Egypt demographic and Health Survey, 2014[22]

These regional differences reflect differences in the power relations, absence of voice, and the ineffective criterion for resource allocation.

Obviously, geographic regions in Egypt lend themselves to the concern of unfair allocation of equal opportunities to resources for health (education, employment, gender norms, ….) as well as to the unfairness in the health system responsiveness to different needs of social groups (demonstrated in part four).

Turning to the inequality of SRH among wealth and gender norm classifications, the question of the fairness of the distribution of wealth and gender norms in society is more difficult to address.

The answer to this question requires investigating gender and wealth policies and showing how they support the production of differentiated wealth and differentiated gender norms. In terms of the distribution of wealth and gender norms by region, the fact that these stratifiers are not randomly distributed across regions and are clustered in deprived areas is in itself reflection of unfairness. Clearly the unfair policy for national resource allocations and health system provision manifested itself in the nonrandom distribution of poverty and conservative norms by region.

In terms of other policies for wealth production, the distribution of education services and the distribution of access to quality education as well as distribution of economic opportunities, skill acquisitions, training and financial inclusions by wealth categories are all pieces of information that can demonstrate the fairness or unfairness of structural policies.

The preliminary evidence that exist point to the maldistribution of these opportunities by social groups. Data and studies are available to indicate the inequitable: access to early childhood development services, to enrolment in schools, to access to higher education, to decent employment, as well as to loans and training by social class.

The failure of policies to prevent or address these inequitable distribution of wealth is clearly harmful to SRH of disadvantaged groups.

In terms of distribution of gender norms and whether there are certain policies that can produce differences in gender norms. It was already suggested that both geographic deprivation and wealth

deprivation do interact with prevailing gender norms and lead to more conservative values within disadvantaged regions and poor social groups.

Egypt is currently placing gender norms as a central challenge. It is clear that, contrary to policies on the region and wealth fronts, these norms are the most difficult to deal with by the state as they are socially grounded and have been shaped and evolved across time. Addressing these norms requires social policies that trace their roots, reveal their link to wrongful interpretation of religion and show their unfair impact on women. Currently, in Egypt, there is high-level political commitment calling for reform of the religious discourse that re-discuss, among others issues, many of the misconceptions on gendered norms. In addition, many efforts are currently underway to tackle gendered-cultural norms practices such as circumcision, early marriage and violence against women.

Unfortunately, previous efforts in exploring inequalities in SRH have never paid attention to quantifying gender norms and to make the link between the unequal distribution of gender norms to the inequality of SRH. The paucity of data to capture these norms has added to the challenge of quantifying them and to assessing their impact on SRH inequalities.

At this stage of analysis, there is no evidence to suggest that there are specific gender policies responsible for the production of the distribution of gender norms. What is suggested is the importance of recognizing that gender norms are not equally distributed and of adopting policies and actions that specifically target these differences in norms.

The above discussion of the three social stratifiers reveals the strong overlap and clustering of vulnerability among them. Rural Upper Egyptian women are living in the poorest households and residing in highly conservative communities. Therefore, tackling SRH inequality in within one social stratifiers can contribute in addressing inequality in the other two stratifiers. However, the three social stratifiers offer different policy and program intervention entry points that enforce each other for tackling SRH inequalities produced by the underlying structural determinant.

VI.2. Policy Implications

The following touches briefly on key policy implications that are closely linked to the findings of different parts of the report. A more detailed and broader discussion of policy implications will be presented in the regional report.

- The commitment to SRH policies and actions which have translated itself into progress on many fronts of SRH as well as in the availability of a reasonable evidence base needs to be built upon to address the unfinished agenda of SRH. Also many missing dimensions of SRH that are not centrally on the agenda require more data and efforts to address the challenges.
- The commitment to addressing SRH inequality needs to be demonstrated through an information system capable of systematically measuring, monitoring and tracing inequality to their structural root causes and to the fairness of these causes.
- The challenge of SRH inequality requires more attention, particularly, given the high level of inequality and the fact that the priority SRH inequality challenges are different from priority SRH challenge.
- The health system needs to continue its efforts to address sexual and reproductive health system related challenges. Many of these can not be addressed by the health sector on its own but call for the contributions of other social sectors.
- Health system performance and capacities should be more responsive to differentiated SRH needs of social groups.
- Structural policies (particularly those related to governance, distribution of regional allocation of resources, and wealth, as well as gender norms) need to adopt an equity lens. Such a lens require that these policies adhere to the principle of equal transformative opportunities to all social groups, complemented by adopting the approach of targeting and positive discrimination (sometimes referred to as proportional universalism) to address the unfair distribution of social stratifiers.

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Annexes

Annex 1: Sexual and Reproductive Health Impact Indicators

Indicator	Additional dimension	WHO/EMRO and SDGs Lists	Source in Egypt
Mortality			
1. Maternal mortality ratio		UNFPA2016 SDG3.1.1 WHO/EMRO2010 WHO/EMRO2016 WHO short list	
2. Perinatal mortality rate		WHO/EMRO2010 WHO short list	EDHS2014
3. Neonatal mortality rate	Mother education, gender, wealth, rural/urban	SDG3.2.2 WHO/EMRO2010, WHO/EMRO2016	EDHS2014
4. Infant mortality rate	Mother education, gender, wealth, rural/urban	UNFPA2016 WHO/EMRO2016	EDHS2014
5. Mortality rate attributed to cancer (breast, cervical)		WHO/EMRO2016 SDG3.4.1	
Morbidity			
6. Prevalence of infertility in women		WHO/EMRO2010 WHO short list	
7. Cancer incidence by type of cancer (breast, cervical)		WHO/EMRO2019	
8. Number of new HIV infections per 1,000 uninfected population	Sex, age, key populations	SDG3.3.1 WHO/EMRO2016	
9. Estimated number of new HIV infections		WHO/EMRO2016	
10. Percent of pregnant women (15-24) attending antenatal clinics, whose blood has been screened for HIV and who are sero-positive for HIV		WHO short list	
11. Hepatitis B incidence per 100,000 population		SDG3.3.4	
12. Percent of men aged (15-49) interviewed in a community survey reporting episodes of urethritis in the last 12 months		WHO short list	

Annex 2 Sexual and Reproductive Health Outcome Indicators

Indicator	Additional dimension	WHO/EMRO and SDGs Lists	Source
Social and psychological risk factors			
1. Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1000 women in that age group		UNFPA2016 SDG3.7.2 WHO/EMRO2010	EDHS2014
2. Proportion of women aged 20-24 years who were married or in a union before age 15 and before age 18		UNFPA2016 SDG5.3.1	EDHS2014
3. Proportion of girls and women aged 15-49 years who have undergone female genital mutilation/cutting	Age	UNFPA2016 SDG5.3.2 WHO/EMRO2010 WHO short list	EDHS2014
4. Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence	Age	UNFPA2016 SDG5.2.1	EDHS2014
5. Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months	Age and place of occurrence	UNFPA2016 SDG5.2.2	
6. Proportion of persons victim of physical or sexual harassment, in the previous 12 months	Sex, age, disability status and place of occurrence	UNFPA2016 SDG 11.7.2	
7. Proportion of population subjected to physical, psychological or sexual violence in the previous 12 months		UNFPA2016 SDG16.1.3	
8. Proportion of young women and men aged 18-29 years who experienced sexual violence by age 18	Sex	SDG16.2.3	
9. Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms		SDG 16.3.1	
Biological risk factors			
10. Anemia among women of reproductive age		WHO/EMRO2010 WHO short list	EDHS2014
11. Anemia in pregnant women		WHO/EMRO2010	EDHS2014
12. Low birth weight among newborns		WHO/EMRO2010 WHO/EMRO2016 WHO short list	EDHS2014

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Annex 3: Sexual and Reproductive Health System Indicators

Indicator	WHO/EMRO and SDGs Lists	Source in Egypt
Input		
1. % Government expenditure directed towards reproductive health	UNFPA2016 WHO/EMRO2010	
2. Number of facilities with functioning basic essential obstetric care per 500 000 population	WHO/EMRO2010 WHO short list SDG3.8.1	
3. Number of facilities with functioning comprehensive essential obstetric care per 500 000 population	WHO/EMRO2010 WHO/EMRO2010 WHO short list SDG3.c	
4. Number of skilled birth attendants per 1000 population	WHO/EMRO2010	
5. % Midwives who received evidence-based reproductive health, including family planning, in-service training in a given year	WHO/EMRO2010	
6. Notification of maternal deaths is mandatory	WHO/EMRO2010	
7. % Primary health care facilities providing at least 3 modern family planning methods	WHO/EMRO2010	
8. Delivery points providing necessary medical and psychological services for women with FGM	WHO/EMRO2010	
9. Number of countries with laws and regulations that guarantee full and equal access to women and men aged 15 years and older to sexual and reproductive health care, information and education	SDG5.6.2	
10. Existence of policy on cervical cancer screening	WHO/EMRO2010	
11. Existence of policy on breast cancer screening	WHO/EMRO2010	
12. % Reproductive health service providers trained in youth-friendly service provision	WHO/EMRO2010	
13. Reproductive health service delivery points providing youth friendly services	WHO/EMRO2010	
14. Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration	UNFPA2016 SDG17.19.2	EDHS2014
15. Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics	SDG 17.18.1	
Process		
16. % Women knowing at least three risk factors/danger signals of pregnancy-related complications	WHO/EMRO2010	
17. % Women knowing at least three risk factors/danger signals of delivery-related complications (in the countries with lower rates of institutional deliveries)	WHO/EMRO2010	
Access/demand		
18. Unmet need for family planning	UNFPA2016 WHO/EMRO2010	EDHS2014

19. Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods	SDG3.7.1	EDHS2014
20. Demand for family planning satisfied with modern methods	WHO/EMRO2016	EDHS2014
21. Proportion of women aged 15-49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care	UNFPA2016 SDG5.6.1 WHO/EMRO2016	EDHS2014
22. Antiretroviral therapy (ART) coverage among all adults and children living with HIV	WHO/EMRO2016	
23. Percentage of key populations at higher risk (who inject drugs, sex workers, men who have sex with men) who have received an HIV test in the past12 months and know their results	WHO/EMRO2016	
24. Percent of pregnant women (15-24) attending antenatal clinics, whose blood has been screened for syphilis, with positive serology for syphilis	WHO short list	
Service use		
25. Antenatal care coverage (1+;4+)	WHO/EMRO2010, WHO/EMRO2016, WHO short list	EDHS2014
26. Pregnant women received tetanus vaccination	WHO/EMRO2010	EDHS2014
27. Deliveries in health facilities	WHO/EMRO2010	EDHS2014
28. Proportion of births attended by skilled health personnel	UNFPA2016 SDG3.1.2 WHO/EMRO2010, WHO/EMRO2016, WHO short list	EDHS2014
29. Proportion of caesarean section deliveries	WHO/EMRO2010	EDHS2015, EDHS2014
Outcome		
30. Contraceptive prevalence rate	UNFPA2016 WHO/EMRO2010	EDHS2014
31. Obstetric and gynecological admissions owing to abortion (spontaneous or induced) related complications	WHO/EMRO2010 WHO short list	
32. Reproductive age, 15–49 years, screened for cervical cancer during the past five years	WHO/EMRO2010	
33. % Young men and women age 15–24 years OR "at risk" groups who have correct comprehensive knowledge on HIV prevention	WHO/EMRO2010 WHO short list	EDHS2015

Annex 4: The Commonly Used Health Inequality Measures

Measure	Mathematic Expression	Explanation
Simple (gap) measures		
Relative range (gap) measure	Relative=P_1/P_2	P_1= proportion of population in worst-off
Absolute range (gap) measure	Absolute P_1-P_2	P_2= proportion of population in best-off
Ordered/non-ordered social stratification		
Weighted Absolute Mean Difference (wMD)	$$wMD = \sum_{j=1}^{J} \frac{n_j}{n}\left|y_j - \mu\right|$$	n_j= population size of social groups n= population size y_j= the rate in group j μ= the population average rate
Weighted standard deviation (wSD)	$$wSD = \sqrt{\sum_{j=1}^{J} \frac{n_j}{n}(y_j - \mu)^2}$$	
Coefficient of variation (CV)	$$CV = \frac{\sqrt{\sum_{j=1}^{j} \frac{n_i}{n}(y_j - \mu)^2}}{\mu}$$	
Population attributable fraction (PAF)	$$PAF = \frac{\sum_{i=1}^{i} P_i(\frac{R_i}{R_i}-1)}{1+\sum_{i=1}^{i} P_i(\frac{R_i}{R_i}-1)}$$	P_i = proportion of population at exposure level i RR = relative risk at exposure level i
Index of dissimilarity (ID%)	$$ID\% = 100 * (\frac{^{1/2}\sum|S_0 - S_p|}{\sum S_0})$$	S_0= Observed Share S_p= Population Share
Theil index (Theil T)	$$\text{Theil } T = \sum_{i=1}^{N} p_i r_i ln(r_i)$$	p_i= proportion of the population in subgroup i r_i= ratio of the health indicator prevalence in the subgroup i to the overall health indicator prevalence in the population
Ordered health condition		
Gini coefficient and index (Gini)	Gini= $\sum$ ½{Li+(Li-1)}*{Pi-(Pi-1)}	L_i= is the corresponding cumulative health risk for the ith population group P_i= is the cumulative percent of the population
Ordered social stratification		
Slope index of inequality (SII)	$y = \beta_0 + \beta_1 x_1 + e$ SII= - β_1	Y = outcome β0 = intercept of the regression line and the Y-axis x1 = independent variable e = error β1 = slope of regression line
Relative index of inequality (RII)	RII= $(-\beta_1)$ / Y̌	Y̌= average outcome
Concentration index (CI)	CI=$(P_1L_2-P_2L_1)+(P_2 L_3-P_3 L_2)$+ ....+$(P_{i-1}L_i-P_iL_{i-1})$	P_i= cumulative percent of the population ranked by socioeconomic status

		Li= corresponding cumulative health risk for the ith socioeconomic group
Concentration index distribution need (rCI%)	rCI%= ABS(CI)*75	ABS= absolute value CI= concentration index

Annex 5 Identification of the Most Appropriate Measures of Health Inequalities

This annex presents a statistical comparison among the different measures of health inequalities to identify the most appropriate measure of health inequalities under the non ordered and ordered social dimension

Non-ordered social dimension

Inequality measures relevant to non-ordered social dimensions include:

- o Weighted absolute mean difference (wMD)
- o Weighted standard deviation (wSD)
- o Coefficient of variation (CV)
- o Population attributable fraction (PAF)
- o Index of dissimilarity expressed in percent (ID%)
- o Theil index of inequality (Theil T)
- o Gini Coefficient (Gini)

To identify the relevant inequality measure, geographic region was used as an illustration of the non-ordered social dimension. The seven inequality measures that can be applied to non-ordered stratifier were calculated for the 35 SRH indicators across the geographic region in Egypt. Pearson coefficient of correlation (rp) was calculated to compare the correlation between the results of the seven inequality measures. T-test was used to identify significant correlations between the various measures in each situation.

As shown in Table 4.1, the wMD and wSD were perfectly significantly correlated to each other (rp= 0.993) but were either weakly correlated or not significantly correlated to any of the other measures. The ID% showed perfect positive significant correlation with CV (rp= 0.994). Though the CV had strong positive significant correlation with PAF (rp= 0.907), the ID% had moderate significant correlation with the PAF (rp= 0.906). The CV, PAF and ID% had moderate positive correlation with the Theil (rp= 0.780, 0.692, 0.742 respectively).

Theil T responds to the skewness towards large values by using the "ln" of the ratio to smoothen the differences in data. However, the Theil T is not suitable for very low prevalence/incidence health-related conditions where a risk of zero value for a category was encountered, as it did not provide a value. The Gini depends only on the ranking of the health-related condition and does not consider the social stratification distribution. The PAF depends on the relative risk for each category as compared to the best-off. Thus as the Theil, the PAF is not suitable for low prevalence/incidence health-related conditions. The CV is weighed by the average health condition and depends on the standard deviation rather than the population distribution.

The advantage of the ID% over the other measures is that it respects the population distribution and is weighed by the total observed health condition, Furthermore, the ID% allows for ranking

priorities according as it provides a measure of the magnitude of inequalities expressed as the amount of redistribution required to make estimated geographic inequality equal to zero.

Table 5.1: Correlation between the seven geographic inequality measures for 35 sexual and reproductive health indicators in Egypt

	wMD	wSD	CV	PAF	Theil	Gini	ID%
wMD	1						
wSD	.993**	1					
CV	.376*	.355*	1				
PAF	.338*	0.32	.907**	1			
Theil	0.273	0.287	.780**	.692**	1		
Gini	0.193	0.172	0.011	-0.053	-0.051	1	
ID%	.367*	.336*	.994**	.906**	.742**	0.027	1

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

Non-ordered social dimension

Eleven inequality measures are relevant to ordered social dimensions include:

- o Weighted absolute mean difference (wMD)
- o Weighted standard deviation (wSD)
- o Coefficient of variation (CV)
- o Population attributable fraction (PAF)
- o Index of dissimilarity expressed in percent (ID%)
- o Theil index of inequality (Theil T)
- o Gini Coefficient (Gini)
- o Slope index of inequality (SII)
- o Relative index of inequality (RII)
- o Concentration index (CI)
- o Concentration index percent redistribution need (rCI%)[32]

To identify the relevant ordered social dimension inequality measure, wealth was used as an illustration of the ordered social dimension. All eleven inequality measures suitable for gradient stratifiers were calculated for the 35 SRH indicators and stratified by wealth as an example using the prepared Excel sheets. The r_p was calculated to detect the correlation between the results of the inequality measures (Table 4). The wMD and wSD still either did not present significant correlation or had weak correlation with the other measures. The CV, ID% and Theil T still showed very high positive significant correlation ((rp= 0.935, 0942, 0.987). The PAF was very highly correlated to CV and ID% (rp= 0.935, 0.942 respectively). Furthermore, the CI and the RII were perfectly correlated (rp =0.999). Both the CI and RII were moderately but inversely correlated to CV, PAF, ID% and Theil T (rp= -0.698 to -0.771), as well as weakly and inversely

correlated to the Gini (rp= -0.386 to -0.372). The rCI% showed highest significant correlation with the ID% (rp= 0.939) and the CV (rp= 0.914).

As the ID%, the CI respects the population distribution and its value represents the deviation from inequality. The advantage of the CI over the other measures is that it offers a direction for the inequality and helps in identifying the disadvantaged social groups. It also offers graphical presentation through concentration curve and a redistribution measure (rCI%) highly correlated to the ID%, and thus allows for ranking inequalities according to magnitude. Moreover, if raw data are available, the CI can be decomposed to show the magnitude of the contribution of the various root causes of ill health through multiple regression analysis (decomposition of CI) using more than one social dimension.

Table 5.2: Correlation between the eleven-wealth inequality measures for 35 sexual and reproductive health indicators in Egypt

	wMD	wSD	CV	PAF	Theil	Gini	SII	RII	CI	ID%	rCI%
wMD	1										
wSD	.992**	1									
CV	.505**	.467**	1								
PAF	.504**	.467**	.960**	1							
Theil	.431**	.412*	.856**	.751**	1						
Gini	.338*	0.32	.679**	.633**	.629**	1					
SII	-.433**	-.431**	-.412*	-.450**	-.402*	-.498**	1				
RII	-.543**	-.505**	-.715**	-.701**	-.680**	-.651**	.756**	1			
CI	-.545**	-.504**	-.712**	-.700**	-.662**	-.645**	.755**	.999**	1		
ID%	.493**	.445**	.995**	.949**	.843**	.669**	-.408*	-.721**	-.720**	1	
rCI%	.573**	.519**	.939**	.901**	.781**	.617**	-.496**	-.797**	-.801**	.953**	1

***. Correlation is significant at the 0.01 level (2-tailed).*
**. Correlation is significant at the 0.05 level (2-tailed).*

From the above analysis, it was apparent that the ID% is the most pertinent for measuring the geographic inequalities, while the CI% and rCI% are the most relevant for measuring the wealth and gender inequalities.

The simple (gap) measures were not considered for this analysis, even for sex, age and trend distributions, given their many limitations, The gap measures do not take in consideration the group size. The relative and absolute measures may yield contradictory magnitude of inequality, thus will not allow for ranking priorities or monitoring progress overtime. The pair-wise comparisons they provide for stratifiers with multiple subgroups, as geographic classification and wealth, ignore all middle categories that are not being compared.

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Annex 6: The Decomposition analysis

In the previous section, the CI was introduced as a relevant measure of inequality for ordered stratifiers. A major advantage of the CI is that it can be decomposed. The decomposition of the CI allows for decomposing the socioeconomic inequality in health-related outcome into its determinants[38]

The concentration index of a health indicator is additively decomposable to different shares related to the determinants of that health indicator. This is carried out through linking the concentration indices of the determinants of a health variable with the concentration index of the health indicator via a regression model of the determinants.

$$y_i = \alpha + \Sigma \beta_k x_{ki} + \varepsilon_i \qquad\qquad\Longrightarrow\qquad\qquad C = \Sigma W_k C_K + {GC_\varepsilon}/{\mu}$$

Where Weights (W_k) are simply the elasticities of y with respect to each X_k.

$$W = \left(\beta_k \bar{x}_k / \mu \right)$$

To do a decomposition analysis, the following steps were followed:

(i)   Regress the health indicator ob its determinants through an appropriate model. This results in finding the coefficients of the explanatory variables (health determinants).

$$y_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon_i$$

(ii)   Calculate the means of the Health indicator and each of its determinants.
(iii)   Calculate concentration indices for the health indicator and for its determinants (and generalized concentration index of the error term) to find C and C_k (and $GC\varepsilon$)
(iv)   Calculate the absolute contribution of each determinant simply through multiplying health indicator elasticity with respect to that determinant and its concentration index

$$\left[\frac{\beta_k \bar{x}_k}{\mu}\right] C_k$$

(v)   Calculate percentage contribution of each determinant simply through dividing its absolute contribution by the concentration index of the health variable

$$\left[\frac{\beta_k \bar{x}_k}{\mu}\right] C_k / C$$