**Background Paper**



**Setting the Stage for an Information System**

**for Health**

**Sherine Shawky, Hoda Rashad, Zeinab Khadr**

**The Social Research Center, The American University in Cairo**

**Sept 20, 2021**

**Content**

[List of Acronyms ii](#_Toc84408400)

[Executive Summary ii](#_Toc84408401)

[Summary of rethinking information system for health ii](#_Toc84408402)

[Introduction 2](#_Toc84408403)

[Part One: Paradigm shift in thinking health and information for health 2](#_Toc84408404)

[I.1. The value of health as a right for everyone and a social goal is well established 2](#_Toc84408405)

[I.2. The social determinants of health are acknowledged as root causes of ill health and health inequities 2](#_Toc84408406)

[I.3. Health policies and interventions are hardly sufficient to improve the health of the socially disadvantaged groups 2](#_Toc84408407)

[I.4. There is a global consensus on the need for comprehensive and quality data for fair policies and actions 2](#_Toc84408408)

[I.5. Fair solutions cannot be reached without fair evidence 2](#_Toc84408409)

[Part Two: Gaps and challenges in the health information systems 2](#_Toc84408410)

[II.1. Gaps in the global health information systems 2](#_Toc84408411)

[II.2. Gaps in the national health information systems in the Arab region 2](#_Toc84408412)

[II.3. The challenges in proposing an equity sensitive information system for health 2](#_Toc84408413)

[Part Three: Rethinking information systems for health and wellbeing 2](#_Toc84408414)

[III.1. There is a need for a paradigm shift in thinking information systems for health 2](#_Toc84408415)

[III.2 Redefining the goal and role of the information system for health 2](#_Toc84408416)

[III.3. The need for guiding principles to build fair information systems for health 2](#_Toc84408417)

[III.4. Building the needed national and program level measures is the first step on the road 2](#_Toc84408418)

[References 2](#_Toc84408419)

[Annexes 2](#_Toc84408420)

[Annex A: Methodology 2](#_Toc84408421)

[Annex B: Data Sources 2](#_Toc84408422)

# List of Acronyms

AUB: American University of Beirut

AUC: American University in Cairo

CSDH: Commission on Social determinants of Health

DHS: Demographic and Health Survey

DHIS2: District Health Information System Version 2

EMR: Eastern Mediterranean Region

EMRO: Eastern Mediterranean Region Office

FGC/M: Female Genital Cutting/Mutilation

FHS: Faculty of Health Sciences

GHDx: Global Health Data Exchange

HiAP: Health in All Policies

HCV: Hepatitis C Virus

HIS: Health Information System

HSS: Health Systems Strengthening

ICD: International Classification of Diseases

ICPD: International Conference for Population Development

ICPD PoA: International Conference for Population Development Programme of action

IDRC: International Development Research Centre

ISH: Information System for Health

MENA: Middle East and North Africa

MDGs: Millennium Development Goals

MICS: Multiple Indicators Cluster Survey

NCDs: Non-Communicable Diseases

OpenMRS: Open Medical Record System

RMNCH: Reproductive, Maternal, Newborn and Child Health

SDGs: Sustainable Development Goals

SDH: Social Determinants of Health

SRC: Social Research Center

SRH: Sexual and Reproductive Health

SRHR: Sexual and Reproductive Health Rights

TB: Tuberculosis

UN: United Nations

WHO: World Health Organization

# Executive Summary

In 2020, the Faculty of Health Sciences in The American University of Beirut and the Social Research Center of the American University in Cairo with support of the International Development Research Centre (IDRC) of Canada, have been working on an ambitious project to strengthening the whole of government commitment in Arab countries to address health inequities, as well as inform integrated social policies and effective program level implementation. The project specifically aims at strengthening the information base to produce comprehensive evidence base capable of informing policies and interventions. The work realizes the complexity of such information system and the numerous necessary components. This background document presents the results of the first phase. The document aims at giving visibility to the need for a fair information system capable of capturing the social inequalities in health to support informed public demand for just alternatives, monitoring and accountability. The document, as explained below, sets the scene for a paradigm shift in thinking health and information for health, it discusses the gaps and challenges in the databases and paves the ground for the coming two phases.

**The value of health as a right deeply rooted in the structural social determinants is well established**

Health has always been valued as a right for everyone and a social goal. This has been engrained in the heritages of science and knowledge since ancient times. Since the early 1940s, the value of health was clearly articulated in the WHO constitution and definition of health, as well as the Universal Declaration of Human Rights. The Alma-Ata declaration, in 1978, and human development concepts, thereafter, have stressed on a holistic vision for health and well-being. Since then, numerous global, regional and national landmarks acknowledged the social determinants of health as root causes of ill health and health inequities. The Millennium Development Goals (MDGs) in 2000 and the Commission of Social Determinants of Health (CSDH) Report in 2005 came as commitment to help the nations achieve better health and well-being. The lessons learned from monitoring the MDGs and the parallel work of the CSDH showed that all countries have mutual problems calling for global partnerships to address the root causes of social injustice and promote health equity. It was clear that the world has the opportunity to build on the success of the MDGs and look for better future “***The Future We Want***” in Sustainable Development Goals (SDGs). The 2030 Agenda constitutes an important policy framework that can further action on the SDH and promote greater health equity on a global scale. The need for integrated policy framework and action was further illustrated in 2020 with the COVID-19 crises. The COVID-19 pandemic came as a unique illustrative global model for this paradigm shift in thinking health and well-being. The most recent reports of CSDH for the Eastern Mediterranean Region (CSDH-EMR) in March 2021 and the Rockefeller Foundation and Boston University School of Public Commission on Health Determinants, Data and Decision-Making (3-D Commission) in September 2021 urge countries to take action to address the SDH to reverse the worsening trend of social injustice and health inequity.

**Health policies and interventions are hardly sufficient to improve the health of the socially disadvantaged**

The health policies and actions are still applying a biomedical model with the health sector as a sole player. At policy level, Ministries of Health, as well as the government as a whole and the public, still do not position health equity as a measure of social success and as a sign of inclusive and fair society adhering to human rights principles. At program level, health initiatives adopt simplistic conceptualization of the social determinants, reinforcing the monopoly of health sector and undermining the contribution of intersectoral collaborations. The policy level challenge is supported by the fact that the existing data do not make visible the inequitable distribution of health conditions and do not adequately link the inequalities of health threats and the unfair social arrangements.

**Three is a global need for fair, comprehensive, and quality data for fair policies and actions**

There is now a clear consensus that the absence of reliable data on key health issues and related SDH compromises the efforts to improve health and promote health equity. The need for interdependent policies and actions for achieving the SDGs and Universal Health Coverage (UHC) has initiated a global movement to improve the availability and quality of data. The SDGs have stressed on the importance of information and changed the perspective of using few indicators into producing comprehensive evidence using the full list of SDGs indicators as national measures. The reports of the CSDH-EMR and the 3-D Commission urged countries to use data on the social determinants to inform policies and actions. This evidence can be only reached through building an integrated information system covering the full range of factors responsible for generating ill-health. This thinking approach clearly illustrates the gap in the current health information systems’ goal and role which still follow a narrow health policy focus. It is evident that “**fair solutions cannot be reached without fair evidence**”

**Gaps in the global health information systems**

The commonly adopted frameworks for monitoring and evaluation of the health system follow a simplistic health program narrow activities and outcomes. Though numerous international databases are available and present a wealth of data on many health-related aspects, they do not follow a standard classification, many data are not available notably for Arab countries, and inconsistencies between the different databases for similar indicators may exist. Most importantly, the international databases do not capture the equity framing. **Thus, from the available international databases, it is hard to capture the inequalities in health, identify the vulnerable populations or draw information on the root structural determinants.**

**Gaps in the national health information systems in the Arab region**

The role of the HIS in many countries of the Arab region is not always appreciated by the various stakeholders. The national budget to run such a system is hardly a competitor amidst the many health threats and economic challenges. The system mostly evolves in a piece meal fashion and in response to the need for the rapid availability of data for a specific disease or a specific program. The responsibility for health data is often divided among different national ministries or institutions and coordination between them may be difficult due to financial and administrative constraints. The sharing of databases in many Arab countries is not legally bounded. This ends in multiple and poorly linked subsystems that cannot deliver timely, accurate and complete information. **Most importantly, national and program levels health information systems do not allow for monitoring health inequalities and the social determinants of health framing, and the equity lens are still missed**

**The challenges in proposing an equity sensitive information system for health**

The major challenge facing the health information system resides in measuring ill-health, computing health inequalities and moving the discourse from inequality to inequity. Measuring health conditions/diseases is conceptually and technically complex, requiring public health, medical and statistical knowledge and expertise unique to each disease or program area. Accurate measurement of diseases relies on standard case definition which depends upon the availability of clinical diagnoses and disease-specific investigations. Measuring inequalities in health is complex because it requires a method that encompasses linking observed inequalities to the unfairness of their underlying causes. The chief pillars of this method include identifying the context specific social dimensions that render people underprivileged, quantifying the unanticipated health inequalities across the population subgroups, as well as linking the unequal health outcomes to the inequalities in the multilevel structural and intermediate social determinants. These basic requirements are a shared global challenge as the HIS are still struggling towards applying an SDH approach and health equity lens. **Till present, there is no consensus on the list of indicators, the social stratifier(s) and inequality measure that can alert countries to health inequality and guide further policies and actions**.

**Rethinking information systems for health and wellbeing**

There is a need for a paradigm shift in thinking information systems for health. The current HIS is designed to serve the needs of the health sector with a disease and behavior orientation. They remain silent when it comes to provide evidence on social determinants and their interlinkages to health inequalities. All partners are aware of the major data challenges, they all claim the unavailability of data and the inability to measure inequalities, identify the vulnerable populations or to show the interlinkages between the multilevel social determinants and health.

It is clear that health in the new global era is no more the business of the health sector alone. It is a shared responsibility of the government and society. Such evidence cannot pertain anymore to HIS traditional goal “the production of quality data that health system stakeholders can use for making transparent and evidence-based health system interventions”. To move forward there is a need for redefining the goal and role of the information system and moving the discourse from “health information system (HIS)” to “information system for health (ISH)” with a more comprehensive goal, role and principles, as proposed below, to determine production and use of data for better health and well-being “Leaving No One Behind”:

The time provides windows and opportunities to contribute to the ongoing discourse on building context specific ISH and be equipped with right data on health and its determinants. A key initial step is to build a core basket of indicators and inequality measures on national and program levels to guide opportunities for fair policies and interventions. The idea is to build a common language for comparison among and within countries, as well as monitoring progress overtime.

# Summary of rethinking information system for health

Graphical user interface, text

Description automatically generated

# Introduction

Over the past several decades, global awareness about health inequities has increased, along with narrow evidence on their causes (Cash-Gibson et al. 2018). This situation has prompted many voices to question the content of the information base needed to allow countries to develop effective solutions to health inequities (Birn et al. 2017). Many global efforts came out as response. The conceptualization of multilevel pathways of health impact is well articulated that the social, economic and political contexts in which people live produce and uphold the social hierarchies of power and resources (CSDH). These in turn lead to differential life course exposures that are further exemplified by individuals’ behaviors, and end in avoidable and unfair systematic differences in health, within and between countries (Whitehead 1990; CSDH 2008; Solar and Irwin 2010; Schrecker and Bambra 2015). Involving the whole of government in policies and practice have been called for as the only effective way to improve health for all (CSDH 2008). The Commission on the Social Determinants of Health (CSDH) emphasized the approach to development that involves the participation of all levels of national government, civil society, business and local communities to address the multilevel social determinants as means to improve health and promote health equity. The CSDH stated that reducing health inequities would require actions to “***improve daily living conditions and to tackle the inequitable distribution of power, money and resources***” and supported the existing calls for “Health in All Policies” (HiAP), intersectoral actions and win-win strategies where health is either a direct or a co-benefit.

The vision of integrated policies is also evident in the Sustainable Development Agenda (United Nations 2015). The agenda presented a model of integrated thinking over its interdependent Sustainable Development Goals (SDGs) as sensitive measures of national success (United Nations 2015; WHO 2015; WHO 2016). The 2030 Agenda(United Nations 2015) generates a policy framework founded on social justice and human rights to promote progress “***For All***” on a global scale.

It may be appropriate to note that the public health discourse and the development discourse are consistent in their understanding of the need for a comprehensive and integrated approach to progress development and health, as well as their concern with inequalities and their detrimental impact. However, there are a number of key differences in terms of positioning health in their two paradigms, as well as in the differentiation between inequalities and inequities. The public health places health and wellbeing as an impact goal of all other SDGs, it also puts special weight to the role of the structural upstream policies as producing the many levels of unfair opportunities and risk factors for health. This is emphasized in the recent public health framing.

The Arab Ministries of Health (MoH) are attempting to contribute to development, and are struggling to champion the pursuit of health “For All”. These efforts are catalyzed by the urgency to progress on universal health coverage (UHC) and to report progress on the SDGs (Sahay et al 2020). But still the efforts in the Arab world continue to emphasize healthcare services to the detriment of addressing the social determinants as root causes of ill health.

This background document recognizes the many efforts in Arab countries, the political leverage of the SDGs paradigm and the opportunities offered by its pillars. It is also conscious to embrace the important features of the public health paradigm.

A prerequisite for seizing the opportunity offered by the international embrace of the development vision, is the investment in information systems to be able to produce a strong evidence base capable of informing effective policies and interventions. It is quite evident that lack of actionable and timely data on SDH may impede efforts to achieve the SDGs by 2030. Clearly this is a felt need in the global health scene, particularly in developing countries, to allow for understanding the interplay or relationships between health inequities and policy and action (Smith 2013; Whitehead 1998).

Numerous global efforts are on the ground to strengthen the health information systems (HIS) (Lippeveld et al 2000; Sauerborn & Adam 2009). However, in the rapidly changing data landscape, many developing countries as those in Arab countries are still facing paucity of evidence, which is either lacking, fragmented or outdated (Sahay et al 2020).

This work builds on the global effort, and is a contribution to the ongoing discourse on the need for evidence to guide policies and actions in achieving lives of dignity and good health for all “Leaving No One Behind”. It tries to answer a specific question: “**how can countries build an information system capable of providing evidence for guiding fair policies and actions**?”

This work is a collaborative effort between the Faculty of Health Sciences in The American University of Beirut (FSH-AUB) and the Social Research Center of the American University in Cairo (SRC-AUC) with support from the International Development Research Centre (IDRC) of Canada. The project has three phases with an overall aim of strengthening the whole of government commitment in Arab countries to improve health and promote health inequity, as well as inform integrated social policies and effective program level implementation. This background paper, presenting the findings of the first phase, is a synthesis of the global literature to understand the current HIS and the drivers for reform. It follows a systematic approach for conceptualizing the requested reform and the necessary indicators and measures that make health priorities and health inequality priorities evident and link them to their root structural causes. The document aims at supporting the development of an information system that makes visible the unfairness of health inequalities and that can be used to inform policies and guide effective program implementation. The work realizes the complexity of such information system and the numerous necessary components; thus, the final output of the coming two phases is on the identification of a core basket of indicators and measures on national and program levels, as well as on applying the new package in supporting implementation of the SRH programs in Jordan and Morocco.

This background document serves the overall aim of giving visibility to the need for a fair information system. The background document includes the following parts:

* Part One presents the shift in conceptualizing health and information for health.
* Part Two: has three sections. The first describes the gaps in the global health information systems. The second section illustrates the gaps in the national information systems of the Arab region. The third section discusses the challenges in proposing an equity sensitive information system for health.
* Part Three: sets the ground for rethink an information system for health

The background document has 2 annexes:

* Annex A presents the methodology
* Annex B displays the data sources

# Part One: Paradigm shift in thinking health and information for health

This part reviews the evolution of thinking in relation to health, its determinants, the actors for health and the evidence base for health (Annex A). It illustrates how this evolution prompted the current drive for an information system for health.

## I.1. The value of health as a right for everyone and a social goal is well established

This value of health has been engrained in the heritages of science and knowledge since ancient times. When the WHO constitution was signed in 1946, the WHO stressed that health is a fundamental human right for all. For the realization of health, the WHO called for a shift from the focus on curing diseases towards encompassing promotion and prevention. Actions for health should target preserving health or building the health potential through health promotion and prevention of diseases, as well as protecting health through restoring health for the unhealthy through healthcare services. The new direction liberated the concept of health from the narrow continuum of disease and medicine to the WHO broader definition of health articulated in 1948 which came as a reminder of this value of health and framed health as “***state of physical, mental and social well-being***”.

In alignment, the Universal Declaration of Human Rights (UDHR) in 1948 stressed upon the human right basis of health. Article 25.1of the UDHR spelled out clearly that “***Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family***”. The UDHR did not only define health as a state of comprehensive well-being but has spelled out clearly the interlinkages between health and the context in which people live. Furthermore, article 25.1 of the UDHR pointed out to the vulnerable groups who need attention and stated that “***Motherhood and childhood are entitled to special care and assistance….. All children, whether born in or out of wedlock, shall enjoy the same social protection***”. These interlinkages were confirmed in 1966 when the Committee on Economic, Social and Cultural Rights defined the Right to Health as “***A right to the enjoyment of a variety of facilities, goods, services and conditions necessary for the realization of the highest attainable standard of health***”. It has urged governments to adopt appropriate legislations, policies and programs, to ensure the realization of the Right to Health.

Since then, numerous global, regional and national landmarks devoted efforts to guide realizing these goals. The new health perspective was revitalized by the landmark WHO and UNICEF international conference in Alma-Ata in 1978. The main goal of the conference was to discuss the urgent problem of providing people with the right to life and health. The participants stressed the responsibility that governments have for the health of their people. The conference underlined the importance of the social and economic development, as well as the political independence for completely realizing the goal of health realization. The triumph of the event was the adoption of the Alma-Ata Declaration, the 20th century’s key health charter. Article I in the Alma Ata Declaration affirmed that “***health…is a fundamental human right and…… the attainment of the highest possible level of health is a most important world-wide social goal whose realization requires the action of many other social and economic sectors in addition to the health sector***”. Also Article 4 of the Alma Ata Declaration called for the involvement of all related sectors as key to promote health. The Alma-Ata Declaration had three major achievements: defining the goal “***Health for All by the year 2000***”, recognizing the need for interesectoral action for health and identifying Primary Health Care (PHC) as the tool. The “Health for All Policy” ushered a new era in health and a new vision of the disease panorama. The redefinition of health changed the focus on hospitals and the biomedical model of health care. It called for a broader sociopolitical orientation for health policy, encompassing a broad social and economic development context. It gave prominence to the need for action from many other social and economic sectors in addition to the health sector.

In parallel, the Human Development Theory evolved through the work of Mahbub ul Haq and Amartya Sen in the 1980s. They postulated that “***at all levels of development, the three essential capabilities for human development are for people to lead long and healthy lives, to be knowledgeable and to have a decent standard of living”***. The pursuit of development and progress on the social, economic and health fronts was the main global concern over the past decades. The 1980s “Health For All Movement” highlighted the importance of the intersectoral collaboration and of prioritizing equity in health policy (Kreisel and von Schirnding 1998). In particular, the Ottawa Charter for Health Promotion in 1986 recognized that intersectoral action is fundamental to reducing inequalities in health status within the population. The Charter emphasized health promotion both as a concept and strategy for reorienting the health systems to improve health equity and to achieve greater control by individuals and communities over the determinants affecting their health. The Charter emphasized that health promotion includes building healthy public policies which means putting health “***on the agenda of policy-makers in all sectors and at all levels, directing them to be aware of the health consequences of their actions and to accept their responsibilities for health***”.

## I.2. The social determinants of health are acknowledged as root causes of ill health and health inequities

The concepts of the SDH and their impact of health have been illustrated in many landmark reports since the Black report (Gray 1982) and Acheson report (Acheson 1998). The beginning of the new millennium witnessed an international consensus on a set of development goals. The millennium development agenda in 2000 came as commitment to help the developing nations to achieve better health and well-being. In the same context, the CSDH was founded in 2005 as an attempt to encourage actors to channel the existing knowledge into policies and actions for the achievement of health equity to support the efficiency of health systems and the stewardship role of the ministries of health, as well as to encourage intersectoral actions for health (CSDH 2008). In 2008 the CSDH emphasized the role of the social sectors in addressing health inequities. The CSDH emphasized that disparities in health between the rich and poor countries, and between the rich and poor people within the same country, are fundamentally linked to disparities in power and income, goods and services. These factors are reflected, in turn, in disparities in living and working conditions, in the quality of the surrounding natural environment, and in access to health care, education, leisure and other opportunities for a flourishing life. The CSDH directed the attention to the unfair distribution of structural SDH as root causes of ill-health. The CSDH argued that the health landscape is challenged by major social and economic maldistribution with consequent significant inequalities. It became evident that health inequities are largely governed by factors outside of the health system and are driven by people’s access to social, economic and cultural resources and opportunities”. The CSDH emphasized the importance of the call for “Health in All Policies” (HiAP), intersectoral actions, win-win strategies where health is either a direct or a co-benefit.

In 2011, the World Conference on SDH in Rio de Janeiro called for increased engagement of all sectors, stating “***We understand that health equity is a shared responsibility and requires the engagement of all sectors of government, of all segments of society, and of all members of international community***”.

The UN General Assembly report in 2011 (United Nations 2011) on the prevention and control of non-communicable diseases emphasized the need for ‘HiAP’ approaches, and the WHO identified the intersectoral action as a key driver and strategy in achieving universal health coverage (Dye et al, 2013). It was stated that policies and programs must embrace all the key sectors of society, not just the health sector.

The lessons learned from monitoring the MDGs and the parallel work of the CSDH showed that there were significant achievements made, but many challenges persisted as millions of people still lived in poverty and hunger, without access to basic services; several health conditions persisted with significant health differences between the poor and the rich. It was evident that all countries have mutual problems calling for global partnerships to address the root causes of social injustice and promote health equity. It was clear that the world had the opportunity to build on the success of the MDGs and look for better future “***The Future We Want***”. Thus came the SDA, with a new focus on the concept of sustainable development with its social, environment and economic dimensions founded on the principles and values of human rights, social justice and ethical obligations “Leaving No One Behind”. The 2030 Agenda (United Nations 2015) constitutes an important policy framework that can further action on the SDH and promote greater health equity on a global scale.

The need for integrated policy framework was further illustrated in 2020 with the COVID-19 crises. The pandemic came as a unique illustrative global model for this paradigm shift in thinking. As the pandemic swept the world, the COVID-19 health burden was aggravated by and in turn exacerbated the longstanding unjust socioeconomic inequalities (United Nations 2020). The urgent need for social justice and human rights sensitive policies and interventions moved from a proposition to being recognized as a vital need. It is becoming increasingly clear that the inequitable health outcomes, whether from the COVID-19 pandemic or any health condition, run deeper than the morbidity and mortality as a question or even the individuals’ behavior. For countries to recover from any health crisis, the Covid-19 pandemic can be used as an opportunity to work towards evidence-based policies for more socially just societies, resilient systems and health equitable world (*Maani 2021;* United Nations 2020; WHO 2020).

There are two recent landmarks in the same context . The first is the report of Commission on the Social Determinants of Health in the Eastern Mediterranean Region (CSDH-EMR) “***Build back fairer: achieving health equity in the Eastern Mediterranean Region***” published in March 2021. The CSDH-EMR report specific to the EMR, where most of Arab countries exist, was has provided breaking insights on the long prevailing health inequalities with the COVID-19 pandemic adding to this heavy burden. The second is the report by the Commission on Health Determinants, Data and Decision-Making (3-D Commission), an initiative by the Rockefeller Foundation and Boston University School of Public Health. The findings of the 3-D Commission’s final report confirm the impacts of the social determinants as long-term challenges and calls upon policymakers to continually connect the dots between epidemiological data and social determinants data to improve health and well-being for all. Both reports urge countries to take action to address the SDH to reverse the worsening trend of social injustice and health inequity.

## I.3. Health policies and interventions are hardly sufficient to improve the health of the socially disadvantaged groups

There is ample evidence of the extent to which health policies and programs are successful in addressing ill-health. All this evidence shows that the vulnerable social groups (example the poor, the uneducated, the unemployed, the rural residents, the female gender, ..) are the most exposed to ill-health, the least served by public services including healthcare services, and the most resistant to seeking healthcare (CSDH 2008; WHO 2020; CSDH-EMR 2021). The growing literature claims that the role of the health policies and programs will remain handcuffed if not strengthened by the national development efforts and the participation of the “Whole-of-Government” and “Whole-of-Society” policies and actions.

Despite that countries have made great progress in numerous health indicators, many inequities in health persist. This is because the policies and actions are still applying a biomedical model with the health sector as a sole player. At policy level, MoH, as well as the government as a whole and the public, still do not position health equity as a measure of social success and as a sign of inclusive and fair society adhering to human rights principles. Furthermore, other social sectors are neither invited nor held accountable for shaping health inequities. At program level, health initiatives adopt simplistic conceptualization of the social determinants, reinforcing the monopoly of health sector and undermining the contribution of intersectoral collaborations. Such conceptualization does not allow health programs to achieve their potential impact and to respond to those most in need. The policy level challenge is supported by the fact that the existing data do not make visible the inequitable distribution of health conditions and do not adequately link the inequalities of health threats and the unfair social arrangements. The program level challenge is due to the difficulty of moving beyond general understanding of why inequities are occurring to identifying what specifically could to be done, at a program level and in a specific context, to address these inequities.

## I.4. There is a global consensus on the need for comprehensive and quality data for fair policies and actions

There is now a clear consensus that the absence of reliable data on key health issues and related SDH compromises the efforts to improve health and promote health equity (Okonjo‐Iweala & Osafo‐Kwaako, 2007; Pundo, Manya, Mburu, & Braa, 2013). The need for interdependent policies and actions for achieving the SDGs and UHC has initiated a global movement to improve the availability and quality of data. The SDGs in Target 17.18 stresses on the need to “….***increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts***”. Specifically, indicator 17.18.1 “***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***” has stressed on the importance of information and changed the perspective of using few indicators into producing comprehensive evidence using the full list of SDGs as measure of the national success.

In recognition of the need for reliable data, many global, regional and national initiatives and strategies were adopted to build sound evidence for decision making. These are carried out under the partnerships between development partners and national governments (Sahay et al 2020). The WHO, over the years, has taken important steps to strengthen the evidence-informed health policy-making. The WHO in the Fifty-eighth World Health Assembly in 2005 acknowledged that “***the generation and application of knowledge are critical for achieving the internationally agreed health-related development goals, including those contained in the United Nations Millennium Declaration, improving the performance of health systems, advancing human development, and attaining equity in health***”. In the same year, the Health Metrics Network (HMN) was launched to help countries and other partners improve global health by strengthening the systems that generate health-related information for evidence-based decision-making. Through iterative work, it is intended that the HMN concentrate efforts on strengthening country leadership for health information production and use globally (WHO 2012).

Europe began a comprehensive approach to integrate SDH data into existing surveys following the publication of the CSDH report (CSDH 2008). In the United States, multiple surveys routinely collect data on SDH as housing, education, and employment. In several developing countries, the Living Standards Measurement Survey, supported by the World Bank since 1980, have been one of the main sources of data on education, labor, employment, income, food security, housing conditions, and assets. Demographic and Health Surveys (DHS) are conducted since 1984 every five years supported by the United States Agency for International Development (USAID) and cover a range of social determinants including electricity, housing, wealth, education, employment and many others in more than 90 countries in the world.

In 2020, the WHO Regional Office for Europe revised its principles on data (WHO 2020), which include the need to treat data as a “***public good***”, “***uphold the highest standards of data protection and respect for human rights***”, “***support Member States’ data and health information systems capacity***”, be a “***responsible data manager and steward***” and fill public health data gaps using “***transparent models and methods***” to create “***coherent estimates (that may be based on disparate or incomplete sources of data)***”.

In 2019, the WHO Eastern Mediterranean Region Office (WHO-EMRO), which hosts most of the Arab countries, endorsed the framework for improving the national institutional capacities for evidence informed health policy making in 2020-2024. The CSDH-EMR regional report urged countries of the region to “***take action on social determinants of health to improve health equity***“ and to “***develop data and monitoring systems to inform evidence-based action on health equity and greater transparency and accountability***”. The 3-D commission report recommended countries to use “**all available data resources on the determinants of health to inform decision-making about health”** and that “**data on the social determinants of health should contribute to better, more transparent and more accountable governance**”.

## I.5. Fair solutions cannot be reached without fair evidence

It is not possible to find solutions to health problems without evidence on the context-specific causes and determinants. This evidence can be only reached through building an integrated information system that extends to cover the full range of factors responsible for generating ill-health and coincides with the full scope of the concepts of health. In other words, our lives are known to be shaped by the SDH, but their relevance on a given population’s health will vary based on the population’s context. Additionally, contextual factors will contribute to which populations are the most vulnerable. Improving population health through actions on determinants of health can be at the heart of an agenda that aims to produce and use data to improve population health and promote health equity. This thinking approach clearly illustrates the gap in the current HIS goal which is “**the production of quality data that health system stakeholders can use for making transparent and evidence based health system interventions**”.

This narrow HIS founding goal does not allow for encompassing the full range of evidence needed to face the inequities in health and promote social justice. The SDGs have even provided a policy framework that shows clearly that this goal does not hold any more. The SDGs framework illustrates the close interlinkage between the health goal and the other SDGs that are not only limited to health policies and health system interventions. The COVID-19 pandemic has confirmed in practice this close interlinkages. Health is both an input and outcome of the life course social, economic and environment context. Health targets and indicators are spread over the full range of SDGs not only in SDG3. Table 1 illustrates the interlinkages between the SDGs and health.

#### Table 1: Interlinkages between sustainable development goals and health

|  |  |
| --- | --- |
| **Risk Factors for Health (Direct Effect on Health)** | |
| 2. Hunger and food security  6. Water and sanitation  7. Energy | 11. Cities  13. Climate change  16. Peaceful and inclusive societies |
| **Determinants of Health (Indirect Effect on Health)** | |
| 1. Poverty  4. Education  5. Gender equality  8. Economic growth and employment | 9. Infrastructure, industrialization, innovation  12. Consumption and production  14.. Oceans, seas and marine resources  15. Ecosystems |
| **Implementation** | |
| 10. Inequality | 17. Global partnerships |

It became evident that the time has come for a paradigm shift in thinking information systems and broadening its goal and role in alignment with the global direction.

# Part Two: Gaps and challenges in the health information systems

This part draws on the synthesis of literature and on existing efforts for strengthening HIS (Annexes A and B). It attempts to identify the gaps in the current HIS, as well as the challenges that need to be addressed to support the mainstreaming of SDH and health equity. Such mainstreaming paves the way for the required equity sensitive information system for health.

This part is divided into three sections. The first section describes the gaps in the global HIS. The second section describes the gaps in the HIS of the Arab region. The third section discusses the challenges in proposing an equity sensitive information system for health.

## II.1. Gaps in the global health information systems

### II.1.1. The health systems’ monitoring and evaluation frameworks do not apply an SDH framing.

The commonly adopted frameworks for monitoring and evaluation (M&E) of the health system follow a simplistic health program narrow activities and outcomes. An example is the results framework of the WHO Health Systems Strengthening (WHO-HSS) (WHO 2009). This framework has a narrow disease-specific and health interventions focus. It only directs monitoring of health system to show how inputs to the health 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. This results chain framework gets translated into the traditional narrowly conceptualized HIS. A system that does not allow for supporting the stewardship role of the health system or alerting other non-health sectors to the unfairness in their policies and interventions.

An opportunity that can be built upon is the SDH sensitive monitoring framework was provided by WHO in 2016 (WHO-b 2016). This framework includes two dimensions as follows:

* + - **Monitoring SDH actions**: the SDH actions are defined as governance, policy or program interventions aimed at improving the social gradient in the conditions of health. With the aim of addressing the health inequities, these SDH actions have been the center of attention in both the report of the CSDH (CSDH 2008) and the Rio Political Declaration (WHO 2011). This focus was clearly justified by the urgency to take actions to tackle inequities and to move away from the sectoral nature of the programs and interventions currently implemented in the area of health equity.
    - **Monitoring SDH conditions**: the SDH conditions are defined as the set of power, resources and money capacities that individuals need to produce health and that facilitate access to health services. These conditions are linked together to impact health outcomes namely equity in population health. SDH conditions are considered the base upon which the design of health interventions and public health programs are built. These conditions also provide clear assessment of the impact of the SDH actions.

### II.1.2. The global databases provide wealth of indicators

Numerous international databases are available and accessible. They present a wealth of data on many health-related aspects. The combination of indicators from more than one database could help in providing a more comprehensive picture of a country. Examples are the WHO Global Health Observatory; The World Bank World Development and SDGs Observatories; the United Nations Department of Economic and Social Affairs Statistics Division; The UN SDGs database; the Global Health Data Exchange (GHDx); the UNICEF Data for Monitoring the situation of children and women; The global burden of disease database and many others (Annex B1).

These databases include over 1,000 indicators on mortality, morbidity and risk factors. They also cover health system indicators. Social indicators illustrating the living conditions are also available. All indicators have their metadata with clear definition and standard methodology. They allow for comparison between countries, as well as illustrate and compare progress over time in health indicators. All international databases have incorporated the full list of indicators of the SDGs.

It is worth mentioning that the United Nations Development Program (UNDP), Regional Bureau for Arab States (RBAS) launched The Arab Development Portal (ADP) since April 2016, as a bilingual data warehouse and knowledge platform (https://data.arabdevelopmentportal.com/). ADP offers data and knowledge, from national and international sources, on key development topics in the Arab Region. It aims at filling the data gaps and producing the essential evidence to guide policies and actions on development in the Arab region.

These databases are quite valuable and are helpful in guiding the selection of the package of indicators. However, the following features need to be noted. First, these datasets do not follow a standard classification. They are either presented under different themes or categories that differ from one data set to the other or are arranged in an alphabetic order. Second, data on several indicators are not available. This is particularly true for Arab countries, including the rich Gulf Cooperation Council (GCC) countries. This is because they are either not collected, or they are collected but not calculated in the required standard international manner or they are available but not shared (WHO 2012; Sahay et al 2020). Third, inconsistencies between the international databases for similar indicators may exist. This is because the various databases may rely on different data resources or are provided by different reporting authorities in the national counterparts. Fourth, most of the available data present national averages. The disaggregation by social groupings is hardly available for Arab countries in international databases.

A key challenge is utilizing the international database is discussed in the following section.

### II.1.3. The international databases do not capture the equity framing.

The equity framing postulates a linkage between the unfairness in the distribution of structural social determinants and the inequalities in the distribution of health outcomes. The international data bases lack data on SDH, their distribution, and on health-related outcomes disaggregated by social groupings. These are the minimum set of data to allow investigating the equity framing.

Also, almost all databases have no specific section on monitoring inequalities in health. An exception is noted in the WHO Global Health Observatory which include a specific section “Health Equity Monitor Database”. This section reports data on reproductive health interventions; maternal health interventions; Newborn and child health interventions; composite coverage index of reproductive, maternal newborn and child health (RMNCH) interventions and Health outcomes. However, most of the data, notably for countries in the Arab region are not available or outdated. When they are available, they just illustrate inequalities by few social groupings.

**Thus, from the available international databases, it is hard to capture the inequalities in health or identify the vulnerable populations and draw information on the distribution of social determinants. Further, the link of the health outcomes to their different multilevel structural social determinants is difficult to infer.**

## II.2. Gaps in the national health information systems in the Arab region

The following provides a general overview of the status of the HIS in the Arab region.

### II.2.1. Weak and fragmented HIS

Similar to developing countries, the role of the HIS in many countries of the Arab region is not always appreciated by the various stakeholders. The national budget to run such a system is hardly a competitor amidst the many health threats and economic challenges (WHO 2012). The system mostly evolves in a piece meal fashion and in response to the need for the rapid availability of data for a specific disease or a specific program. Such a need, in many instances, is driven by donors requirements and project funding. Countries then risk being overwhelmed by parallel subsystems and fragmented pieces of information.

### II.2.2. Difficulties in data co-ordination and linkages among data sources

The responsibility for health data is often divided among different national ministries or institutions. For example, births and deaths statistics rely on the smooth co-ordination between the MOH, the Ministry of Interior and national statistical institutes. Coordination between the different partners may be difficult due to financial and administrative constraints. In addition, sharing of databases in many countries, notably developing countries, is not legally bounded. This ends in multiple and poorly linked subsystems that cannot deliver timely, accurate and complete data (WHO 2012; Sahay 2020).

### II.2.3. Population-based data sources are inadequate or unavailable in several developing countries

Population-based data sources are the means to correctly understand the country’s reality and measure impact of policies and strategies. Three population-based information sources exist, they include the vital registration, the census and the large household surveys (WHO 2012; WHO 2013). The vital registration system of births and deaths is the best, up-to-date and most-reliable source for population and health. It is used, since centuries, in developed countries for guiding policies. Though vital registration provides continuous ongoing process of data collection and cover the total population, it is not used in monitoring health-related challenges and policies in many of the developing countries. The census is another source that can contribute to estimating some population challenges. The census provides full coverage of all people, however, it is implemented every around 10 years, requires much financial and human resources, as well as it is deficient in many health-related data. The large household surveys, for example the Demographic and Health Surveys (DHS), Multiple Indicators Cluster Surveys (MICS) and others are the third source of population-based information. They are conducted in almost all developing countries to provide population estimates from a representative sample of the population. These surveys are usually conducted regularly every around 3 years, however, this may not be the case in several countries for financial or administrative reasons. Thus, many developing countries are losing major sources of information and are currently building policies and strategies on estimates that may not reflect reality or true impact of policies and strategies.

### II.2.4. Health systems and program-based health information systems do not allow for monitoring health inequalities

Despite that HIS exist in all countries since decades, they remain under-developed to meet the data needs. The HIS in many developing countries including the Arab region are mostly limited to medical care and health care service utilization with few information on the social factors. Additionally, the data revolution experienced these days has not been equitably experienced worldwide. While electronic medical records almost nearly replaced the paper-based system, in developed countries it has not much progressed in many developing countries over the past decades (Webster 2011; WHO 2015; Clifford 2016; Odekunle et al 2017). Private healthcare sector in developing countries also started to transition, but the public sector still lags behind (WHO 2015; Ohuabunwa 2016).

Cognizant of the weakness of HIS in several developing countries, there are numerous efforts on the ground to strengthen the HIS. For example, the global introduction of the District Health Information System Version 2 (DHIS2) and the Open Medical Record System (OpenMRS). Both platforms have found widespread use in various developing countries under support of global partners (Sahay 2020). The DHIS2 is a flexible open-source platform developed, evolved, and supported by the University of Oslo, Norway, since more than a decade, and now finds use in different degrees in more than 80 countries (see www.dhis2.org). DHIS2 started out as a platform for building aggregate data-based health management information system (HMIS), but over the years has included a “Tracker” module, which allows individual‐based data processing, such as line lists for births, deaths, and notifiable diseases, individual registration, and follow of people under different programs like antenatal care, antiretroviral treatment (ART), and tuberculosis (TB) treatment. The DHIS2 is implemented in several Arab countries, yet the system remains incomplete and still cannot connect various services received by a patient in a hospital (such as registration, billing, disease status, drugs, and laboratory results). The OpenMRS (https://openmrs.org/), is another widely used open-source platform for hospital systems and different types of disease registries. The OpenMRS is not designed to be an HMIS or suitable to support primary health care–based applications. Most importantly, both platforms in their current status may allow for monitoring health, can be improve to allow for monitoring healthcare equity but are not designed to monitor health equity in the broader sense.

### II.2.5. The social determinants of health framing and the equity lens are still missed

Despite the current awareness of the impact of the social, economic and political factors on health, the SDH framing and the equity lens remain outside the boundaries of the HIS. Even the efforts in developed countries are still in early phase of measuring SDH and health inequalities. For example:

* In 2004 the United States Centers for Disease Control (CDC) compiled lists of SDH indicators and their sources in a data set directory (Hillemeier 2004). The use of data to understand linkage between SDH and health outcomes was demonstrated numerous times since then. Examples are the impact of food insecurity on cardiovascular outcomes ( Wang et al 2021), the cost-effectiveness of food prescriptions within health insurance (Lee et al 2019).
* In the United Kingdom, the Biobank initiative collected biologic samples, physical measurement together with a range of SDH information (such as employment status, education, income, car ownership, ethnicity, mental health, social support, occupation, housing, domestic heating and cooking fuel, means of travel, shift work, and mobile phone uses) from 500,000 people between 2006 and 2010 (Allen et al 2020).
* The 2019 report of the state of the food security and nutrition in the world used SDH data from multiple sources (as age, sex, height, food consumption, food availability) to assess minimum energy requirements, inequalities and energy supply, and then created a statistical model to estimate the prevalence of undernourishment globally (UNFAO 2020)
* The WHO Health Behavior in School-aged Children (HBSC) in young people was a collaborative study conducted every four years in 50 countries across Europe and North America. The HBSC aimed at measuring the health behaviors and their social determinants in young people to inform policy and practice (http://www.hbsc.org/).

Despite all these efforts, several pitfalls exist. First, there is no SDH adapted conceptualization in the HIS structures to illustrate the linkages between the structural drivers, the differential exposures and health outcomes. Second, the data produced are still the national average data and disaggregation by context specific social stratification are hardly available and if available they pertain to intermediate determinants rather that structural determinants. Third, it is hard to measure the inequalities and identify the true underserved and vulnerable populations. Fourth, all all HIS strengthening efforts focus mainly on providing evidence to address healthcare equity as the health system is the main focus and sole player, they do not provide information on health status inequities which are the responsibility of the “Whole-of-Government” policies and actions. All these factors mark the lack of timely, high quality comprehensive data on SDH (Exworthy M 2008; Guerra et al 2016).

### II.2.6. The produced health related data may not satisfy the stakeholders’ needs

Despite the disease focus, many health-related data remain unavailable, notably in developing countries. Example of these include mental health problems, injuries, renal diseases, and many others. The available type of data is not sufficient to alert policy makers to the magnitude of inequalities and the priority health inequalities. The need for health-related data and the range of SDH aggravates the fragility of the HIS, especially when coupled with lack of financial resources and human capabilities (WHO 2012; Shawky 2018; Rashad et al 2019).

In addition, the presentation of health-related data is frequently aimed at academics with little effort to present the information in formats that are comprehensible to policymakers, the public or those working in sectors other than health. As a result, there is a widely established perception that health information is obscure, unclear and sometimes contradictory. When data are not available in response to stakeholders needs, there may be a loss of attention to its role, a vicious cycle of under-investment, low production and no use. Particularly, decision-makers need information that is relevant, reliable, timely and direct. The literature presents many anecdotal accounts that even with high-quality information, its appropriate use in the decision making process is not guaranteed (WHO 2012)

## II.3. The challenges in proposing an equity sensitive information system for health

### II.3.1. Difficulties in measuring health

Measuring health conditions/diseases is conceptually and technically complex, requiring public health, medical and statistical knowledge and expertise unique to each disease or program area. Accurate measurement of diseases relies on standard case definition as the WHO international classification of diseases (ICD). It also depends upon the availability of clinical diagnoses and disease-specific investigations. In developing countries, ICD codes are hardly used to report heath conditions (Sahay et al 2020). If used they are just applied on death certificates to register the causes of death. ICD are not used to code health conditions of the newborns or parents in birth certificates which are not even used to provide population total denominators. Health conditions reported in census or household surveys are mostly those provided by participants with no further confirmatory diagnoses or investigations. As a result, population-based health statistics is limited in terms of scientific soundness and usability.

### II.3.2. Inequities in health are not directly measurable but are inferred from the unfair systematic inequalities in health

Fundamental to achieving the health equity goal is the ability of countries to identify and monitor progress on the health status and health equity front ‘‘Leaving No One Behind.’’ However, inequities in health are not directly measured but are judged from the existence of systematic inequalities in health distribution among the various social groups. But still, measuring inequalities in health is complex because it requires a method that encompasses inferring the observed inequalities to the unfairness of their underlying causes (Wagstaff 1991; Asada 2006; Braveman 2006; Shawky 2018). The chief pillars of this method include identifying the context specific social dimensions that render people underprivileged, quantifying the unanticipated health inequalities across the population subgroups, as well as linking the unequal health outcomes to the inequalities in the multilevel structural and intermediate social determinants. These basic requirements are a shared global challenge as the HIS are still struggling towards applying an SDH approach and health equity lens.

### II.3.3. There is no consensus on social stratifier(s) that can alert countries to health inequalities and guide further policies and actions

In the literature (Wagstaff 1991; Asada 2006; Braveman 2006; O’Donnell et al 2008; Spinakis et al 2011; Shawky 2018; ), as well as, in SDGs, there is wealth of information that can be used to reflect the social dimensions of ill-health and guide policies to improve health and promote health equity. The social stratifiers recommended in literature are reflected in SDG17.18 which defines a large range of social stratifications “***income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts***”.

However, the use of many social stratification will not allow for identifying priority health inequalities. A standard sensitive stratifier, as well as a minimum list of context specific stratifiers, if included in the HIS, will perform better in identifying priority health inequalities and guiding the package of public policies. The challenge is to identify the standard stratifier(s) sensitive to capture the health inequalities, as well as point to the underprivileged and underserved populations.

### II.3.4. The use of simple gap measures is very misleading and does not provide sufficient evidence on the magnitude and trend of health inequalities

The addition of an inequality measure(s) in HIS to alert countries to priority health inequalities is still not appreciated. It is customary known that prevalence and incidence measures act as an alarm to alert countries to the priority health conditions, which are further investigated within a country to identify the causes behind their spread. There is significant evidence that priority health conditions are not necessarily the priority health inequalities (Rashad et al, 2019). This highlights the need to go beyond national averages in measuring health.

Consequently, providing health-related data disaggregated by social stratification became a must. However, even with such data, the problem is not solved. Disaggregated data illustrate the likelihood that certain population subgroups are more at risk or more likely to develop unfavorable health status as compared with the other groups. Comparing the prevalence or incidence in the various social groups using a relative or absolute gap measure is still insufficient. In the very early years of the new millennium, the WHO used to present the risk ratios for poorest/richest, females/males, rural/ urban and mother’s no/high education in its global statistical report. Yet given the many limitations notably that a risk ratio does not provide the true magnitude, does not allow for comparisons between or within countries and does not allow monitoring trend, this measure is not presented any more. Most importantly the relative and absolute risk measures are not population weighed, they do not reflect the excess concentration of a health related outcome in a population subgroup whether they are more at risk or not (WHO 2013; Shawky 2018). It is evident that the likelihood of being at risk of ill-health as measured by the relative risk ratio or the odds ratio is not necessarily equivalent to the unequal distribution and concentration among the vulnerable and underserved population subgroups. These are two dimensions imperative to be reflected in the HIS. In other words, comparing the various groups using the relative ratio or the difference is intended to measure the risk of being affected, not the concentration of the affected in specific vulnerable and underserved population subgroups.

It is evident that illustrating inequalities requires a measure that allows for comparing distributions rather than risk. Till present, there is no consensus on a standard inequality measure that can be engrained in HIS to measure health inequalities. In the literature there are around 13 different inequality measures, however, recent research has identified two measures - relative index of dissimilarity expressed in percent (rID%) and concentration index redistribution need expressed in percent (rCI%), as both measures produce comparable results (Koolman and van Doorslaer 2004; O’Donnel et al 2008; Pampalon et al 2009; Spinakis et al 2011; WHO 2013; Chee et al 2013; Shawky 2018; Rashad et al 2019). Both measures have several advantages. They respect the population distribution and their values represent the deviation from inequality. They are self-weighted as their calculation is based on the population distribution and is weighed by the total observed health-related condition. They provide a measure of magnitude of inequality, thus help in ranking inequalities by magnitude, identifying inequality priorities and monitoring trend. A cut off point ≥ 10% can be used to identify the priority inequalities (Koo;man 2004).

However, till present the distribution inequality measures are still not part of HIS. All efforts are directed towards adding disaggregated data that just illustrates the difference in likelihood and not the difference in concentrations.

### II.3.5 Moving the discourse from health inequality to health equity

The major challenge is in moving the discourse from health inequality to health equity as it links the unequal distribution in health outcomes to the unfairness in the social context which is the outcome of the structural determinants. This is a judgmental decision but can still be reached from information systems and can guide further in-depth analysis on national level. On the systems/program level, the magnitude of the health-related inequalities made available in the information system can identify the priority inequalities and underserved populations that need rapid action. In addition, making visible the inequalities in vulnerable exposures and in health-related outcomes provide a clear clue to the unfairness in structural drivers. On national level, the descriptive evidence produced in the information system can identify the priority health inequalities and trigger them to conduct a more advanced decomposition analysis to calculate the share of the various social determinants in the detected health inequalities. The decomposition analysis allows one to estimate how the determinants proportionally contribute to the inequality in a health variable thus making evident the healthcare inequalities that is the responsibility of the healthcare system and the health inequalities which require a “Whole-of-Government” and HiAP approach.

# Part Three: Rethinking information systems for health and wellbeing

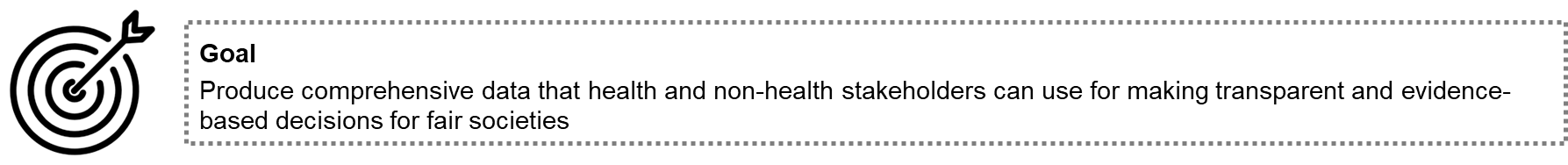
This part aims at rethinking the information system needed to guide policies and action for better health and well-being For ALL. It proposes a transformative change in defining the goal and role of the information system.

## III.1. There is a need for a paradigm shift in thinking information systems for health

All efforts to date with respect to HIS are highly acknowledged, yet they face the multiple complexity of such systems which cannot be done in a one-step approach to satisfy users’ needs. Despite the progress in the current HIS, such systems remain silent when it comes to provide evidence on SDH and interlinkages to health inequalities. The efforts are directed to serve the needs of the health sector with a disease and behavior practice orientation. They mostly focus on improving technology to computerize and link information in a platform or on compiling the available information whether on national or international levels in an observatory. They go further to improving visualization of data in dashboards or interactive programs. All partners are aware of the major data challenges, they all claim the unavailability of data and the inability to measure inequalities, identify the vulnerable populations or to show the interlinkages between the multilevel social determinants and health.

## III.2 Redefining the goal and role of the information system for health

It is clear from the previous sections that health in the new global era is no more the business of the health sector alone. It is a shared responsibility of the government and society. To address ill-health there is a need for full-fledged evidence to guide the national policies and programs and measure the national success. Such evidence cannot pertain anymore to HIS goal “**the production of quality data that health system stakeholders can use for making transparent and evidence-based health system interventions**”. This goal clearly misses two key bottle necks. First, it does not take in account the stewardship role of the health systems and national responsibility to improve health and well being for all citizens. Progress in population health cannot depend on a single sector and requires scientific understanding of the role of the multilevel SDH (Galea 2020). Actions to improve health and promote health equity mostly fall outside the health sector. To move forward there is a need for reconsidering the goal of the information system and moving the discourse from “health information system (HIS)” to “information system for health (ISH)” with a more comprehensive goal as below:



Second, it also ignores that for measuring health, it is imperative to consider the two dimensions of health which are 1) the likelihood of being more at risk of an ill-health condition; and 2) the concentration of ill-health in certain population social groups whether they are at risk or underserved or both. Such vision requires a more critical thinking when efforts come to reform or strengthen the health systems to redefine its role as below.

**Shape

Description automatically generated with medium confidence**

## III.3. The need for guiding principles to build fair information systems for health

The time provides windows and opportunities to contribute to the ongoing discourse on building context specific ISH and be equipped with right data on health and its determinants. This work aims in future phases on building data that can inform policies and programs. At the core, this work builds on framing the data to meet the policy change needs. It is founded on the below values and principles to determine production and use of data for better health “Leaving No One Behind”:

Shape

Description automatically generated

## III.4. Building the needed national and program level measures is the first step on the road

The information system is very complex multicomponent system. A key initial element is to determine what data should be collected and for what purpose. This is the focus of the future phases which can either complement the current HIS efforts or ingrain the first brick for new ways of building ISH. The understanding that environment in which people live influence health suggests that better measures are needed to guide opportunities for fair policies and interventions. Improving people’s health requires more than individual behavior changes but rather changes to social and economic environment in which people live. The COVID-19 pandemic, marked by economic recession in many countries, exacerbation of unequal health determinants and social conditions, and unequal health outcomes, serves as a reminder to the need for comprehensive data in predicting and monitoring health outcomes, and embedding these insights in real-time decision-making (Maani et al 2021).

Being aware of the data needs, a core set of well-defined national and program indicators and inequality measures are the base for building a potent ISH that serves the government policies and program success. While the SDH represent a potential agenda for health and improving policies and actions, they pose a challenge in terms of choosing the right indicators and inequality measures. Allocating sufficient time and money to collect all the relevant data on all possible options would not be practical or justified in all countries or programs. There is a need for a sincere effort to build a standard core basket of indicators and inequality measures with space for further context specific additions whenever deemed necessary. The idea of the standard core basket is to build a common language for comparison among and within countries, as well as monitoring progress overtime. The reason for having two lists of indicators - a national level and program level – is to monitor the overall national success, as well as the program responsiveness to people’s needs.

# References

Acheson D, Great Britain, eds. *Independent Inquiry into Inequalities in Health: Report*. Stationery Office; 1998.

Allen N, Sudlow C, Downey P, Peakman T, Danesh J, Elliott P, et al. UK Biobank: Current status and what it means for epidemiology. Health Policy Technol [Internet]. 2012 Sep 1 [cited 2020 Dec 16];1(3):123–6. Available at http://www.sciencedirect.com/science/article/pii/S2211883712000597.

Ansari Z, Carson NJ, Ackland MJ, Vaughan L, Serraglio A. A public health model of the social determinants of health. Soz Praventivmed. 2003;48(4): 242–51. Available from:. https://doi.org/10.1007/s00038-003-2052-4.

Asada Y. A framework for measuring health inequity. J Epidemiol Community Health. 2005;59:700–705. Braveman P. Health disparities and health equity: concepts and measurement. Annu Rev Public Health. 2006;27: 167–194.

Birn A-E, Pillay Y, Holtz TH. Textbook of Global Health. Oxford: Oxford University Press; 2017. https://doi.org/10.1093/acprof:oso/9780199392285. 001.0001.

Braveman P. Health disparities and health equity: concepts and measurement. Annu Rev Public Health. 2006;27: 167–194.

Cash-Gibson L, Rojas-Gualdrón DF, Pericàs JM, Benach J. Inequalities in global health inequalities research: a 50-year bibliometric analysis (1966–2015). PLoS One. 2018;13:e0191901. https://doi.org/10.1371/journal.pone. 0191901.

Chee G, Pielemeier N, Lion A, Connor C. Why differentiating between health system support and health system strengthening is needed. Int J Health Plann Mgmt. 2013;28: 85–94.

Clifford GD. E-Health in Low to Middle Income Countries. *J Med Eng Technol*. 2016;40(7-8):336-341. doi:10.1080/03091902.2016.1256081

CSDH (2008). Closing the gap in a generation: health equity through action on the social

determinants of health. Final Report of the Commission on Social Determinants of Health.

Geneva, World Health Organization. Available at <https://apps.who.int/iris/bitstream/handle/10665/43943/9789241563703_eng.pdf>.

CSDH-EMR 2021. Build back fairer: achieving health equity in the Eastern Mediterranean Region. Report of the Commission on the Social Determinants of Health in the Eastern Mediterranean Region.

Dahlgren G. Whitehead M. Policies and Strategies to Promote Social Equit in Health. Stockholm, Sweden: Institute for Futures Studies; 1991.

Diderichsen F, Evans T, Whitehead M. The social basis of disparities in health. In: Evans T, editor. Challenging inequities in health: from ethics to action. New York: Oxford University Press; 2001. p. 12–23.

Douglas C Dover and Ana Paula Belon. The health equity measurement framework: a comprehensive model to measure social inequities in health.  International Journal for Equity in Health 2019: 18:36. Available at https://doi.org/10.1186/s12939-019-0935-0

Dye C, Reeder JC, Terry RF. The world health report 2013: research for universal health coverage. Geneva: WHO; 2013

Exworthy M 2008. Policy to tackle the social determinants of health: using conceptual models to understand the policy process. Health Policy and Planning 2008;23:318–327 doi:10.1093/heapol/czn022. Available at https://doi.org/10.1093/heapol/czn022.

Galea S, Abdalla SM, Sturchio JL. Social determinants of health, data science, and decision-making: Forging a transdisciplinary synthesis. PLOS Med. 2020;17(6):e1003174. doi:10.1371/journal.pmed.1003174

Gray AM. Inequalities in health. The Black Report: a summary and comment. *Int J Health Serv Plan Adm Eval*. 1982;12(3):349-380. doi:10.2190/XXMM-JMQU-2A7Y-HX1E.

Guerra G, Borde E, Salgado de Snyder VN. Measuring health inequities in low and middle income countries for the development of observatories on inequities and social determinants of health. Int J Equity Health 2016 Jan 19;15(1):9. Available from: https://doi.org/10.1186/s12939-016-0297-9.

Hillemeier M, Lynch J, Harper S, Casper M 2004. Data Set Directory of Social Determinants of Health at the Local Level. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2004. Available at https://www.cdc.gov/dhdsp/docs/data\_set\_directory.pdf.

Koolman X, van Doorslaer E. On the interpretation of a concentration index of inequality. Health Econ. 2004;13: 649–656.

Kreisel W, von Schirnding Y. Intersectoral action for health and wellbeing: a cornerstone for healthfor-all in the twenty-first century. World Health Stat Q. 1998;51(1):75–8.

Lippeveld, T., Sauerborn, R. A., & Bodart, C. (2000). In T. Lippeveld, R. Sauerborn, & C. Bodart (Eds.), Design and implementation of health information systems. Geneva: World Health Organization.

*Maani N, Abdalla SM, Galea S. Avoiding a legacy of unequal non-communicable disease burden after the COVID-19 pandemic. Lancet Diabetes Endocrinol. 2021;9(3):133-135. doi:10.1016/S2213-8587(21)00026-7*

*Nason* *Maani, Salma M Abdalla, Sandro Galea.* Avoiding a legacy of unequal non-communicable disease burden after the COVID-19 pandemic. Published **Online** February 4, 2021 https://doi.org/10.1016/ S2213-8587(21)00026-7.

Oakes JM, Rossi PH. The measurement of SES in health research: current practice and steps toward a new approach. Soc Sci Med. 2003;56(4):769–84.

Odekunle FF, Odekunle RO, Shankar S. Why sub-Saharan Africa lags in electronic health record adoption and possible strategies to increase its adoption in this region. *Int J Health Sci*. 2017;11(4):59-64.

O’Donnell O, van Doorslaer E, Wagstaff A, Lindelow M. Analyzing Health Equity Using Household Survey Data: A Guide to Techniques and Their Implementation. Washington, DC: World Bank, 2008.

Ohuabunwa EC, Sun J, Jean Jubanyik K, Wallis LA. Electronic Medical Records in low to middle income countries: The case of Khayelitsha Hospital, South Africa. *Afr J Emerg Med*. 2016;6(1):38-43. doi:10.1016/j.afjem.2015.06.003.

Okonjo‐Iweala, N., & Osafo‐Kwaako, P. (2007). Improving health statistics in Africa. Lancet, 370, 1527–1528.

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Summary measures of socioeconomic inequalities in health. Toronto, ON: Queen’s Printer for Ontario; 2013. Available at https://www.publichealthontario.ca/-/media/documents/S/2013/socioeconomic-inequality-measures.pdf

Pampalon R, Hamel D, Gamache P. A comparison of individual and area-based socio-economic data for monitoring social inequalities in health. Health Rep. 2009;20(4):85–94.

Pundo, R., Manya, A., Mburu, E., & Braa, J. (2013). The consistency and concurrency between the Kenya HIV/AIDS Program Monitoring System (KePMs) and the National Reporting System (DHIS2), 2012. In: 8th Health Informatics in Africa Conference (HELINA 2013). doi:https://doi.org/10.12856/JHIA‐2013‐v1‐i1‐56.

Rashad, H., Shawky S., and Khadr Z. (2019) “Reproductive Health Equity in the Arab Region: Fairness and Social Success” Regional Study; The Social Research Center, The American University in Cairo, UNFPA/ASRO. https://documents.aucegypt.edu/Docs/src/Reproductive-Health-%20Equity-in-the-Arab-Region.pdf

Sahay S, Rashidian A, Doctor HV. Challenges and opportunities of using DHIS2 to strengthen health information systems in the Eastern Mediterranean Region: A regional approach. E J Info Sys Dev Countries. 2020: 86;e12108. https://doi.org/10.1002/isd2.12108.

Savigny, D., & Adam, T. (Eds.) (2009). Systems thinking for health systems strengthening. Alliance for health policy and systems research. Geneva, Switzerland: World Health Organization.

Schrecker T, Bambra C. How Politics Makes Us Sick: Neoliberal Epidemics. London: Palgrave Macmillan; 2015. https://doi.org/10.1057/9781137463074

Shawky S 2018. Measuring Geographic and Wealth Inequalities in Health Distribution as Tools for Identifying Priority Health Inequalities and the Underprivileged Populations. Global Advances in Health and Medicine 2018: Volume 7: 1–10. Available at <https://journals.sagepub.com/doi/pdf/10.1177/2164956118791955>.

Shawky S, Rashad HM, Khadr ZA, Sahbani S, Afifi MA. A methodology for investigating and addressing sexual and reproductive health inequities in the sustainable development agenda. SDH. 2020;e25. DOI: <http://dx.doi.org/10.22037/sdh.v6i1.33678>

Smith K. Evidence-Informed Policy in Public Health. Beyond Evidence-Based Policy in Public Health. London: Palgrave Macmillan; 2013. <https://doi.org/> 10.1057/9781137026583\_2.

Solar O, Irwin A. A Conceptual Framework for Action on the Social Determinants of Health: Social Determinants of Health Discussion Paper 2. Debates, Policy & Practice, Case Studies. Geneva: World Health Organization; 2010.

Spinakis A, Anastasiou G, Panousis V, Spiliopoulos K, Palaiologou S, Yfantopoulos J. Expert Review and Proposals for Measurement of Health Inequalities in the European Union—Summary Report. Luxembourg: European Commission Directorate General for Health and Consumers; 2011. ISBN 978-92-79-18529-8.

Stephen Y. Wang, Lauren A. Eberly, Christina A. Roberto, Atheendar S. Venkataramani, Peter W. Groeneveld. Food Insecurity and Cardiovascular Mortality for Nonelderly Adults in the United States From 2011 to 2017: A County-Level Longitudinal Analysis. Circulation: Cardiovascular Quality and OutcomesVolume 14, Issue 1, January 2021. Available at https://doi.org/10.1161/CIRCOUTCOMES.120.007473

The 3-D Commission. The 3-D report: Data, social determinants, and better decision-making for health: The report of the 3-D Commission. Boston: 3-D Commission; 2021

United Nations General Assembly. Prevention and control of non-communicable diseases, report of the Secretary General. New York, UN: 2011

United nations 2014. Framework of Actions for the follow-up to the Programme of Action of the International Conference on Population and Development Beyond 2014 Report of the Secretary-General. Available at https://www.unfpa.org/sites/default/files/event-pdf/93632\_unfpa\_eng\_web.pdf

United Nations. Transforming our world: the 2030 agenda for sustainable development. New York: United Nations; 2015. Available at <https://sustainabledevelopment.un.org/post2015/transformingourworld>.

United Nations-b, 2015. Resolution adopted by the General Assembly on 25 September 2015 70/1. Transforming our world: the 2030 Agenda for Sustainable Development http://www.un.org/ga/search/view\_doc.asp?symbol=A/RES/70/1&Lang=E

United Nations, 2016 . Transforming our world: the 2030 Agenda for Sustainable Development. In: Sustainable Development Knowledge Platform [website]. New York: United Nations; 2016. https://sustainabledevelopment.un.org/post2015/Transforming our world

United Nations 2020. Policy Brief: The Impact of COVID-19 on the Arab Region An Opportunity to Build Back Better https://saudiarabia.un.org/sites/default/files/2020-07/sg\_policy\_brief\_covid-19\_and\_arab\_states\_english\_version\_july\_2020.pdf.

United Nations, 1995. Report of the International Conference on Population and Development (Cairo, 5– 13 September 1994). New York: United Nations; 1995 (A/CONF.171/13/Rev.1; http://www.ipci2014.org/en/node/64).

United Nations, 1996. Report of the Fourth World Conference on Women (Beijing, 4–15 September 1995). New York: United Nations; 1996 (A/CONF.177/20/Rev.1;http://www.un.org/womenwatch/daw/beijing/official.htm).

United Nations 2015. the Millennium Development Goals Report 2015 Available at <http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201)>. Pdf.

United Nations Food and agriculture organization 2020. The State of Food Security and Nutrition in the World (SOFI): Safeguarding against economic slowdowns and downturns. World Food Programme in collaboration with International Food and Agriculture Development (IFAD), UNICEF and WHO. Available at https://docs.wfp.org/api/documents/WFP-0000106760/download/?\_ga=2.186396458.200506557.1621932271-905335662.1621932271.

Wagstaff A, Paci P, van Doorslaer E. On the measurement of inequalities in health. Soc Sci Med. 1991;33(5):545–557.

Webster PC. The rise of open-source electronic health records. *The Lancet*. 2011;377(9778):1641-1642. doi:10.1016/S0140-6736(11)60659-4

Whitehead M. The Concepts and Principles of Equity and Health. Copenhagen: WHO Regional Office for Europe; 1990. http://whqlibdoc.who. int/euro/-1993/EUR\_ICP\_RPD\_414.pdf

Whitehead M. Diffusion of ideas on social inequalities in health: a European perspective. Milbank Q. 1998;76:469–92. https://doi.org/10.1111/1468-0009. 00099.

World Health Organization 1986. The Ottawa charter for health promotion. Geneva: (WHO/HPR/HEP/95.1). http://www.who.int/healthpromotion/conferences/previous/ottawa/en/

World Health Organization; 1986. Intersectoral action for health and wellbeing: the role of intersectoral cooperation in national strategies for health-for-all. Geneva: (http://apps.who.int/iris/bitstream/10665/41545/1/9241560967\_eng.pdf.

World Health Organization, Geneva, 2009. Monitoring and evaluation of health systems strengthening An operational framework. Paper prepared by WHO (Ties Boerma and Carla Abou‐Zahr), World Bank (Ed Bos), GAVI (Peter Hansen) and Global Fund (Eddie Addai and Daniel Low‐Beer) as part of the joint work on health systems strengthening and IHP+ common evaluation framework

World Health Organization Regional Office for Europe 2010. Parma Declaration on Environment and Health. Parma, Italy.

World Health Organization 2010, Government of South Australia. Adelaide Statement on Health in All Policies:moving towards a shared governance for health and well-being. Report from the international meeting on health in all policies. Geneva: World Health Organization; 2010 (www.who.int/social\_determinants/hiap\_statement\_who\_sa\_final.pdf); Krech R, Valentine NB, Tucker Reinders L, Albrecht D. Implications of the Adelaide Statement on Health in All Policies. Bulletin of the World Health Organization. 2010;88:720

World Health Organization 2011. Rio political declarations on social determinants of health. World Conference on Social Determinates of Health, Rio de Janeiro, Brazil, 19-21 October 2011

World Health Organization 2012. Framework and standards for country health information systems, second edition. WHO and Health metrics network (HMN) second editionprinted 2008 and reprinted 2012.

World Health Organization 2013. Handbook on Health Inequality Monitoring with a special focus on low- and middle-income countries. World Health Organization 2013.

World Health Organization 2015. Health in 2015: from MDGs to SDGs. Geneva: World Health Organization; 2015. Available at http://www.who. int/gho/publications/mdgs-sdgs/en.

World Health Organization 2016. Sustainable development goals. Geneva: World Health Organization; 2016. Available at <http://www.who.int/topics/sustainable-development-goals/en>.

World Health Organization-b 2016. Implementing Rio: Monitoring Action On The Social Determinants Of Health, Background Paper. Technical Meeting For Measuring And Monitoring Action On The Social Determinants Of Health, Ottawa, Canada: 20–22 June 2016.

World Health Organization. Health and well-being profile of the Eastern Mediterranean Region: an overview of the health situation in the Region and its countries in 2019. Cairo: WHO Regional Office for the Eastern Mediterranean; 2020. Licence: CC BY-NC-SA 3.0 IGO.

World Health Organization; Regional Office for Europe 2020. Health 2020: a European policy framework supporting actions across government and society for health and well-being. Copenhagen. (http://www. euro.who.int/en/what-we-do/health-topics/health-policy/ health-2020-the-european-policy-for-health-and-well-being.

WHO. WHO, USAID, World Bank, Countries and Partners Align on New Way Forward to Measure Impact of Country Health Programs, WHO. https://www.who.int/hrh/news/2015/measurement-summit2015/en/

[Yujin Lee](https://www.ncbi.nlm.nih.gov/pubmed/?term=Lee%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=30889188),[Dariush Mozaffarian](https://www.ncbi.nlm.nih.gov/pubmed/?term=Mozaffarian%20D%5BAuthor%5D&cauthor=true&cauthor_uid=30889188), [Stephen Sy](https://www.ncbi.nlm.nih.gov/pubmed/?term=Sy%20S%5BAuthor%5D&cauthor=true&cauthor_uid=30889188), [Yue Huang](https://www.ncbi.nlm.nih.gov/pubmed/?term=Huang%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=30889188),[Junxiu Liu](https://www.ncbi.nlm.nih.gov/pubmed/?term=Liu%20J%5BAuthor%5D&cauthor=true&cauthor_uid=30889188), [Parke E. Wilde](https://www.ncbi.nlm.nih.gov/pubmed/?term=Wilde%20PE%5BAuthor%5D&cauthor=true&cauthor_uid=30889188),1 [Shafika Abrahams-Gessel](https://www.ncbi.nlm.nih.gov/pubmed/?term=Abrahams-Gessel%20S%5BAuthor%5D&cauthor=true&cauthor_uid=30889188), [Thiago de Souza Veiga Jardim](https://www.ncbi.nlm.nih.gov/pubmed/?term=Jardim%20Td%5BAuthor%5D&cauthor=true&cauthor_uid=30889188), [Thomas A. Gaziano](https://www.ncbi.nlm.nih.gov/pubmed/?term=Gaziano%20TA%5BAuthor%5D&cauthor=true&cauthor_uid=30889188) and [Renata Micha](https://www.ncbi.nlm.nih.gov/pubmed/?term=Micha%20R%5BAuthor%5D&cauthor=true&cauthor_uid=30889188). Cost-effectiveness of financial incentives for improving diet and health through Medicare and Medicaid: A microsimulation study. [PLoS Med.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6424388/) 2019 Mar; 16(3): e1002761. Published online 2019 Mar 19. doi: [10.1371/journal.pmed.1002761](https://dx.doi.org/10.1371%2Fjournal.pmed.1002761).

# Annexes

## Annex A: Methodology

### A.1. Literature review

The language used for the search was English, and covered two areas:

* + - Literature on HIS, SDH and health equity describing their conceptualization and data requirements.
    - International, regional and national literature and initiatives for health information system strengthening (HISS) and for applying the equity lens in HIS.

The search used the PubMed, Google Scholar, and Google search engine with the terms “health systems”, “health systems strengthening”, “social determinants of health”, “health inequalities”, “SRH” “SRH inequities” “indicators” “inequality measures”, “SDGs”. The search also covered outputs from international bodies. (i.e., World Health Organization, United Nations Population Fund, World Bank, ….)

### A.2. Search for data sources

A second search was directed to review the international and national databases. The search aimed at identifying the available databases and their components - structures, list of indicators, inequality measures, availability and quality of data in general and in Arab countries in particular. The search used English and Arabic languages and used the above search engines. The key words used were “observatories”, “platforms’ “portals”, “dashboard” “indicators” “SDGs”. A specific health focus was also used with the terms “health observatories”, “health platforms’ “health portals, “health dashboard” “health indicators”, “health inequality indicators” “MENA countries” “Arab Countries”, “Eastern Mediterranean Countries”, “Developing countries”, “Jordan”, “Morocco”.

In addition, a search of MENA countries’ websites and large household surveys, was conducted to identify the available national information. The names of national MOH, HIS and statistical offices, as well as the names of large household surveys (example DHS, MICS, Family Health Survey, ……) were used.

### A.3. Search for the internationally recommended health-related measures

A search was done to identify the internationally recommended health-related indicators. The search focused on the list of WHO indicators, the list of WHO indicators for the Eastern Mediterranean region, the UNFPA list of indicators and the SDGs indicators.

A similar search was done to identify the health inequality measures recommended in the literature. The search aimed at identifying their strengths, limitations and use in health-related databases.

## Annex B: Data Sources

### B.1. International data sources

|  |  |
| --- | --- |
| Global Health Data Exchange(GHDx), Global Burden of Disease Study(GBD) | http://ghdx.healthdata.org/ |
| The DHS Program, Demographic and Health Surveys | http://dhsprogram.com/ |
| MICS, Multiple cluster surveys | https://mics.unicef.org/surveys |
| The World Bank, Gender Statistics Database | http://data.worldbank.org/ |
| The World Bank, Health Nutrition and Population Statistics | http://datatopics.worldbank.org/hnp/HNPSDG |
| The World Bank, World Development Indicators | https://databank.worldbank.org/source/world-development-indicators |
| The World Bank, Sustainable Development Goals database | https://databank.worldbank.org/source/sustainable-development-goals-(sdgs) |
| United Nations, Population Division, World Population Prospects | https://esa.un.org/unpd/wpp/ |
| United Nations, Department of Economic and Social Affairs, Statistics Division, SDG database | https://unstats.un.org |
| UNICEF Data, Monitoring the situation of children and women | https://data.unicef.org/indicator-profile/HVA\_PREV\_KNOW/ |
| WHO and UNICEF Joint Monitoring Programme (JMP) for Water Supply, Sanitation and Hygiene | https://washdata.org/ |
| World Health Organization (WHO), Global Health Observatory | https://www.who.int/gho/en/ (https://apps.who.int/gho/data/node.home) |
| World Health Organization (WHO), Global Health Expenditure database | http://apps.who.int/nha/database |

### B.2. National data sources

|  |  |  |
| --- | --- | --- |
| Algeria | National Statistical Office (ONS), Algeria | http://www.ons.dz/-Population-et-Demographie-.html |
| Algeria | Institut National de la Sante Publique; Ministere de la Sante, de la Population et de la reforme hospitaliere | http://www.sante.gov.dz/index.php/indicateurs |
| Bahrain | Ministry of Health, Bahrain | http://www.data.gov.bh/ |
| Bahrain | Information and eGovernment Authority, Bahrain Open Data Portal | http://www.data.gov.bh/en |
| Egypt | Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt | www.capmas.gov.eg |
| Iraq | Central Statistical Organization (CSO), Iraq | http://cosit.gov.iq |
| Jordan | Department of Statistics (DOS), Jordan | http://web.dos.gov.jo/ |
| Jordan | Ministry of Health, Jordan | www.moh.gov.jo |
| Kuwait | Central Statistical Bureau (CSB), Kuwait | www.csb.gov.kw |
| Lebanon | Central Administration of Statistics (CAS), Lebanon | www.cas.gov.lb |
| Lebanon | Ministry of Public Health, Lebanon | www.moph.gov.lb |
| Libya | Bureau of Statistics and Census (BSC), Libya | www.bsc.ly |
| Morocco | Haut Commissariat au Plan (HCP), Morocco | www.hcp.ma |
| Oman | National Centre for Statistics and Information (NCSI), Oman | www.ncsi.gov.om |
| Palestinian | Palestinian Central Bureau of Statistics (PCBS) | www.pcbs.gov.ps |
| Qatar | Planning and Statistics Authority, Qatar | https://www.psa.gov.qa/en |
| Saudi Arabia | General Authority for Statistics, Saudi Arabia | www.cdsi.gov.sa |
| Saudi Arabia | Ministry of Health, Saudi Arabia | https://www.stats.gov.sa/en |
| Sudan | Federal Ministry of Health, Republic of Sudan | www.fmoh.gov.sd |
| Sudan | Central Bureau of Statistics (CBS), Sudan | http://www.cbs.gov.sd/ |
| Syria | Central Bureau of Statistics (CBS), Syria | http://www.cbssyr.sy/people%20statistics/Final\_Report\_Syria\_ARB.pdf |
| Tunisia | National Institute of Statistics (INS), Tunisia | www.ins.tn |
| Tunisia | Ministry of Health, Tunisia | www.santetunisie.rns.tn |
| United Arab Emirates | Federal Competitiveness and Statistics Authority (FCSA), United Arab Emirates | www.fcsa.gov.ae |
| Yemen | Central Statistical Organisation (CSO), Yemen | www.cso-yemen.org |
| Yemen | Ministry of Public Health and Population, Yemen | http://www.moh.gov.ye/arabic/report\_2004.html |