

## The Social Roots of Health Inequity in Tunisia: A Preliminary Study on the Social Determinants of Health Inequity

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### ABSTRACT

Addressing the Social Determinants of Health is critical if we truly want to achieve health equity. The World Health Organization's Commission on the Social Determinants of Health (2008) recognized the need to broaden the understanding of these determinants among the general public to facilitate change in communities and improve the overall health status. Using the data from the Tunisian Health Examination Survey (2016), this quantitative preliminary study explored the state of social inequity in health among the Tunisian population using a quantitative statistical analysis that shed light on the relations between the SDHs (Age – gender – SES – Geographical location – Area of residence – and Educational attainment) and the self-rated health status. This preliminary study explored the current state of health equity in Tunisia through exploring the hidden patterns of social identity formation and power relation inside society. This preliminary study also pointed out certain aspects of health inequity in Tunisia as well as the social factors and determinants contributing to the status-quo. The findings of this preliminary study could be the basis of an ambitious academic work that will explore the intersection between SDHs and their impact on health outcomes in Tunisia that will be an asset in the process of implementing health equity policies in the future.

**Keywords:** Social determinants of health, Health equity, Tunisia, Social factors, health outcome, Socio-economic inequality, Regional disparities.

### INTRODUCTION

The phenomenon of inequality has been widely observed by the field of social sciences since it is at the heart of interests of this discipline. It would be improbable to find an aspect of human social life that social inequality does not touch. That's why Social scientists are committed to rigorously examine different trends in which individuals are unequal (Kallenberg & Meyer, 2012).

Research on the differences in health outcomes within populations and their social roots has a long tradition dating back to the classic era of social sciences in the 19th century by different pioneers. The social and economic origins of health inequity have been well-documented since the industrial revolution in the 1840s, which led to a series of scientific studies, starting with the work of Friedrich Engels that established a link between high mortality and poor living conditions of the working class in England, and the thoughts of a pioneer researcher, Rudolf Virchow that studied the relation between pandemics and epidemics in one hand, and economy and poverty on the other hand. Later, the work of Salvador Allende that highlighted the impact of social factors on health (Jayasinghe, 2015).

Nowadays, Despite the rapid development of medical technology and medicine that has greatly improved the overall population state of health worldwide, Over the past decade, several studies, mainly in underdeveloped countries and marginalized regions where the social gap is more obvious, highlighted that the difference in the social gradient that affects the socioeconomic status, has led to inequality in health (Schofield, 2007). People with higher socioeconomic status can afford daily medical expenses, and the education they receive allows them to understand the importance of health. Conversely, individuals in the lower socio-economic class may find themselves tight in a lifestyle cycle. They usually suffer from high rates of harmful behaviors such as smoking, lack of exercise, and long-term consumption of junk food. The existence of these behaviors makes it difficult to solve health problems that contribute to health inequalities (Singh et al., 2017).

Several recent studies found correlations between vulnerability and social disadvantage along with poor health status and low life expectancy (Irwin et al., 2006; Odekina, 2015), the data from these studies is suggesting that the health equity gap is getting wider and wider despite growing in wealth and technological advancement (Bonney et al., 2007; Cox, 2016).

However, although health differences are obvious and can be easily observed, these differences cannot be solely attributed to biological, medical and genetic factors. The more we dig into the depth of health inequalities, the more we realize that a lot of it is not only attributed to a particular biological malfunction, it is beyond that, reaching the core of being human; a social being (Benoit et al., 2009).

These observations led to a general acceptance in research and policy circles that health inequalities are socially caused (Blas et al., 2008; Veenstra, 2013). These differences are attributed to demographic and societal factors, universally and scientifically known as the Social Determinants of Health (SDH) and academic research has made substantial progress in understanding the SDH (Braveman & Gottlieb, 2014; Wilkinson & Marmot, 2003). Moreover, in early 2008 the report of the World Health Organization commission on the social determinants of health noted that the conditions in which people are born, live, work and age are the most important determinant of one's health status (CSDH, 2008; Satcher, 2010).

## **THE SOCIAL DETERMINANTS OF HEALTH**

### **A Framework to Understand Health Differences**

There is a noticeable increase in the literature production where SDH has received considerable attention in the recent few years, which makes one think that it represents a new area of academic research. However, the link between social factors and the impact on population

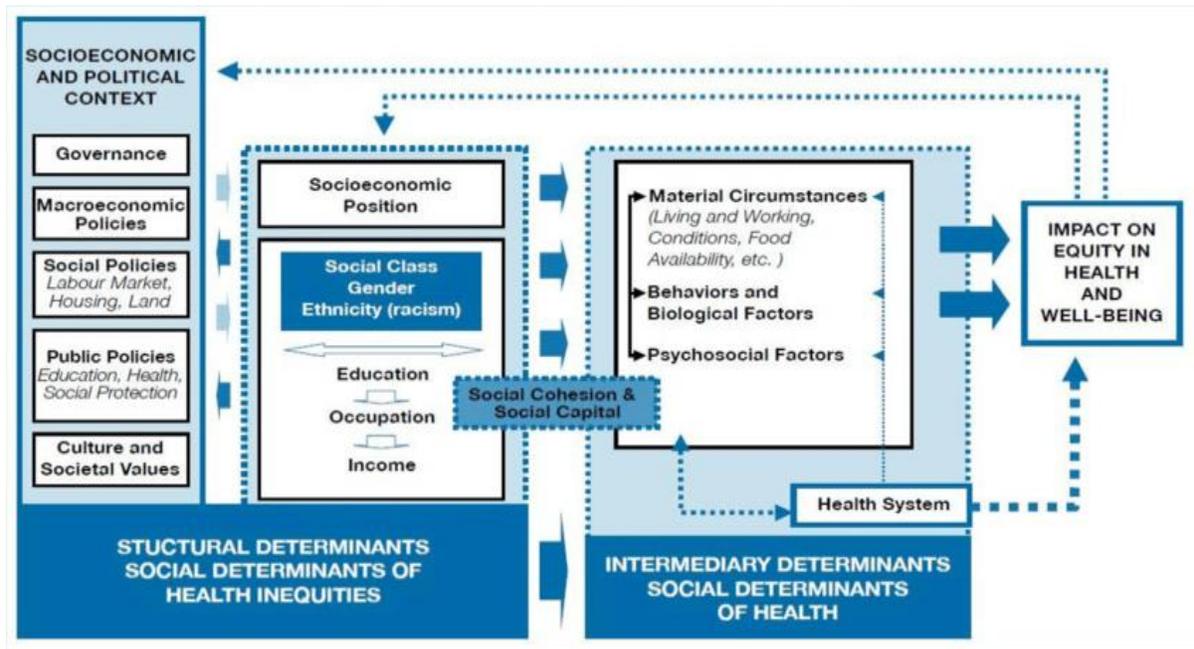
health has long been the subject of debate dating back to the 19<sup>th</sup> century with the recognition of structural determinants of health in the early 1800' with pioneer social scientists like Virchow, Engels and later on McKeown (Braveman & Gottlieb, 2014; Islam, 2019).

Because of the relatively vast amount of literature produced in a small period of time, there was a certain kind of confusion and ambiguities surrounding the subject, with tons of definitions, conceptual frameworks and classifications. This confusion resulted in a growing need toward a clear understanding of the concept, since SDH has a vital role in determining the overall health status and its pivotal implication in the effort focusing on public health improvement by different major stakeholders such as healthcare providers, policy makers and researchers (Singh et al., 2017).

SDH is a very important concept to understand. Because of its impact on the health of individuals and populations, in this section, we will be taking a look at what it is, how it impacts health and a useful framework to understand it. Health is quite variable; it is very simple to come up with such conclusion with a quick look around us. Health is variable not just between individuals but also across different population groups. For example, in 2015 the life expectancy of a child born in Sierra Leone was 50 years whereas in Australia it was 83 years (United Nations Statistics Division, 2017), a difference of 33 years. However, these differences exist even within countries. For example, in Australia the life expectancy of indigenous people is about 10 years lower than that of non-indigenous people (Bonney et al., 2007). Social status is influencing health Within populations, individuals with higher income, a higher level of education and a better occupation, are in a better shape and enjoy a longer life reaching a maximum life expectancy. Health status can change as well, for example, studies of migrants have shown that the type of diseases, health behaviors and risk factors are different in migrants compared to those in their country of origin (Deaton, 2013).

So, why is there so much variability? To answer this question, we must understand the factors that can influence health. It is well recognized in the literature that one's health is influenced by a range of factors, called determinants of health, these include; who they are; individual factors such as age, sex and genetic makeup, and also what they do; this includes their health and lifestyle behaviors such as smoking, physical activity, alcohol use and diet. According to the World Health Organization's conceptualization of Health, it is also largely influenced by the conditions in which people are born, grow, live, work and age, these include their social and community networks, the socio economic, cultural and environmental conditions that people live in as well as healthcare systems, these are collectively called the social determinants of health. SDHs are ultimately shaped by the distribution of wealth, power and resources at an international, national and local level, they have a marked influence on health inequities, which are the unfair and avoidable health differences between different groups of people within countries or between countries. There are many different SDH working across many levels and with complex interactions between them (Solar & Irwin, 2010). In order to understand and explain how these determinants influence and interact with each other to affect health and well-being, several models or frameworks have been proposed. According to the WHO's framework, the SDHs are defined as "*the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems.*" (CSDH, 2008).

As stated in the report of the CSDH, there are two broad types of health determinants that influence health and can lead to health inequities (see figure 1); these are structural determinants; and intermediary determinants. Structural determinants refer to the socio-economic and political context in which a person is born into and lives in, these include governance; how society organizes itself; economic, social and public policies and also the social and cultural values representations of health and illness. These factors can determine and lead to the unequal distribution of material and monetary resources, which shapes a person's socio-economic position. Which in conclusion results in health disparities.



(Solar & Irwin, 2010)

Figure 1. final form of the CSDH conceptual framework

### Equity Means Social Justice

To better understand the goal of Health Equity, we need to learn when health differences among groups of people becomes inequitable. The most appealing definition of Health inequity appeared in the (1991) Margaret Whitehead's widely stated paper entitled (The concepts and principles of equity and health) stating that "health inequities are inequalities in health that are that are not only unnecessary and avoidable but also unfair and unjust". (p. 5)

Social, economic and environmental conditions can affect health in a number of ways creating health inequities. Social Inequities occur when a person is treated unfairly because of things like race, class, gender, sexual orientation or immigration status. Furthermore, according to Bourdieu's argument, institutions such as corporations or schools have the power to create unequal opportunities based on social status (*Dictionnaire de sociologie*, 2001; Molénat, 2009). The inequality of opportunities theory explains that these unequal opportunities can lead to poor educational outcomes or fewer job opportunities creating economic disadvantage (Molénat, 2009). For example, Income can determine the neighborhood you live in (Murray et al., 1999). In return, the environmental conditions of a neighborhood can affect a person's health. Lower-income neighborhoods tend to be in poor socio-environmental

conditions. Examples include being closer to environmental jeopardies such as freeways or power plants, having higher crime or violence rates or limited access to clean water, healthy foods and safe places to exercise (Marshall, 2012). Health Behaviors are also responsible for the noticeable disparities. Education plays a critical role in maintaining a healthy lifestyle, if people are not educated enough, they usually lack social and financial support to make healthy choices. Behaviors such as smoking, poor nutrition or unsafe sexual behaviors increase chances of developing chronic conditions or diseases, which can affect how long someone lives. Smokers live at least 10 years less than nonsmokers (Global Burden of Disease Collaborative Network, 2018; United Nations Statistics Division, 2017).

Although health Disparities could be also affected by our genetic make-up (Hankivsky et al., 2017). We are learning more everyday about the key role access to quality health-care in reducing inequities and disparities. However, health is more than just disease or illness. Health is how we treat others? the opportunities we are given? where we live? and our everyday behaviors.

In order to eliminate health inequity, policy makers need to implement policies where nobody should be denied the chance to live a long healthy life because of social, economic nor environmental conditions. To achieve health equity, policies must include everyone, creating opportunities for all, providing equal access to resources and invest in low-income neighborhoods. Health Equity will be achieved when everyone is able to reach their full health potential (CSDH, 2008).

### **Health Inequity in Tunisia**

In Tunisia, inequalities in health across social class, gender and regional context are the subject of great debate both politically and socially in the main stream media, however, there is a lack of scientific research studying the subject and examining how these dimensions of inequality interact. In fact, a study conducted by Abu-Zaineh & al. (2014) entitled “Fairness in healthcare finance and delivery: what about Tunisia?” is considered to be the first one of the very few and rare analysis of equity in health in Tunisia. Yet, this study was interested in only one of the many dimensions of health equity, which is healthcare utilization.

However, the relation between health equity and the SDH in Tunisia has rarely been studied directly scientifically in any field of medical science let alone social sciences. In reality, the first and the only study that touched the paradigm of the social determinants of health was a paper published by Ben Romdhane & Grenier (2009) entitled “Social determinants of health in Tunisia: the case-analysis of Ariana”.

Several patterns have changed since; mainly on the political and social levels; that made it very interesting to study health equity and several societal issues that affected health and wealth distribution. Therefore, a significant portion of the population remains without healthcare coverage according to the national institute of public health (NIH) despite the sustained statements from government officials indicating that Tunisia almost achieved close to universal coverage (Abu-Zaineh et al., 2014).

Recent data (Institut national de la santé, 2019; Institut national de statistiques, 2018) demonstrate a staggering and growing degree of social and economic inequality in Tunisia that

started to emerge to the surface after the revolution in 2011. Rates of disease and illness for people with low income are worsening across almost all categories and geographic areas across the country. Although the country has seen a sustained improvement in economic, social and health statuses on the population level (Ben Romdhane & Grenier, 2009; Boutayeb & Helmert, 2011) reaching an HDI (Human Development Index) of 0.739 in 2018 against 0.634 in 1998, which is considered a good statistical indicator of life expectancy, education, and per capita income. However, this steadily increased HDI is hidden behind an unequal distribution of the overall growth and development between regions, socio-economic groups and gender, deepening inequalities and disparities between social groups with an Inequality-adjusted Human Development Index (IHDI) of 0.585 (Boutayeb & Helmert, 2011; World Bank, 2020).

### Aspects of Health Inequities in Tunisia

Some argue that the disparities in health outcomes between groups and individuals across the country are the noticeable effect of the unequal distribution of health care resources and services. However, they forget that this unbalanced distribution is due to a continuous misguided government policy resulting into a systematic unfair pre-disposition of power, income and goods (Boutayeb & Helmert, 2011; López & Gadsden, 2016). For instance, official statistics show an evidence of massive healthcare services inequality in Tunisia (Institut national de statistiques, 2018). The data shows a pattern of regional and rural/urban inequality in the distribution of key health institutions, well-equipped hospitals and high-quality healthcare are concentrated in the Coastal (Eastern) regions and around big cities like the District of Tunis, Sfax and Sousse. Moreover, unemployment is very high in Western regions reaching 35.65 % in the North West and 36.56 % in the South West. However, the unemployment rates drop to the lowest levels in the Eastern parts of the country reaching 18.55% in the Center East (Sfax, Sousse, Monastir and Mahdia).

**Table 1. Key Demographic, Socio-Economic and Health Indicators by Regions in Tunisia**

	Geographical Regions						
	District of Tunis	North East	North West	Center East	Center West	South East	South West
Population <sup>1</sup>	2 738.7	1 581.3	1 181.7	2 682.9	1 470.7	1 031.6	617.5
ICU* beds <sup>2</sup>	184	26	0	121	0	0	0
HDI** <sup>3</sup>	0.787	0.744	0.685	0.747	0.657	0.724	0.734
Unemployment <sup>1</sup> (%)	24.87	22.16	35.65	18.55	30.11	34.16	36.56
TEA*** <sup>1</sup> (%)	20	10	8	13	8	11	12
University hospitals <sup>2</sup>	17	3	0	6	1	1	0
Child mortality <sup>2</sup>	696	251	87	615	435	221	170

**Note.** Data collected from multiple sources.

The geographical territorial division is the same proposed by the NIS and the NIH.

\*Intensive Care Unit \*\*Human Development Index \*\*\*Tertiary Education Attainment

<sup>1</sup>(Institut national de statistiques, 2018)

<sup>2</sup>(Santé Tunisie en chiffres 2017 [Tunisia health in figures 2017], 2019)

<sup>3</sup>(Subnational Human Development Index, 2020)

The data from Table 1 show that these patterns of inequality are affecting the population not only on the sanitary level, but also the social and economic level, where the tertiary education attainment drop to 8 % in the Western regions against 20 % in the District of Tunis and 13 % in the Center East (see Table1).

The information in table 1 above also indicates a concentration of government services like public health care and public education in the Eastern Coastal part of Tunisia.

Also, Rural/Urban disparities are problematic in Tunisia. Since its creation after the independence in 1956, the national state launched a series of development plans where rural residential areas weren't included. This can be seen in a variety of indicators; poverty and extreme poverty are three times high in rural areas, the growing number of suicide attempts is becoming a big concern of people's mental health.

The figures shown above in Table 2 are a concrete evidence of marginalization policy the rural population has been suffering from for decades. On the other hand, the luxurious yet stressful urban lifestyle is responsible of high prevalence of obesity and depression (see Table2).

**Table 2. Key Social, Economic and Health Indicators by Area of Residence in Tunisia**

	Area of residence	
	Urban	Rural
Illiteracy <sup>1</sup> (%)	12.5	32.2
Social security <sup>1</sup> (%)	72	47.2
Poverty <sup>1</sup> (%)	10.1	26
Extreme poverty <sup>1</sup> (%)	1.2	6.6
Average annual expenditure per person (TND*) <sup>1</sup>	4465	2585
Prevalence of obesity <sup>2</sup> (%)	28.8	20.6
Prevalence of depression <sup>2</sup> (%)	4.8	4.6
Suicide attempt <sup>2</sup> (%)	3.1	5.4

**Note.** Data collected from multiple sources.

\*Tunisian Dinar

<sup>1</sup> (National Institute of Statistics, 2019)    <sup>2</sup> (National Institute of Health, 2019)

Another aspect of inequality that needs to be addressed, is that one concerning the stark differences between men and women in economic and social positions and in health in conclusion. The data suggests that although women have a higher life expectancy as highlighted in Table 3 below, various studies insist that women experience a greater amount of morbidity than men (Benoit et al., 2009). For example, the prevalence of obesity for women in Tunisia is double that of men, besides women also are more prone to encounter stressful events in their life course, which results in a higher prevalence of depression (see Table 3). From another point of view, men are more likely to be exposed to various health-threatening behaviors, as seen in Table 3, the prevalence of smoking among men is extremely high compared to women (48.3% among men against 2.6% among women), this pattern is also seen in alcohol consumption (see table 3). These numbers can be explained by the fact that it's considered male to smoke and drink alcohol. Furthermore, in oriental culture, masculinity is associated with not showing sad

emotions resulting in a decrease presentation to mental health services among men followed by an increase in suicide rates reaching 4.66 per 100000 persons among men, against 1.93 per 100000 persons among women (see Table 3).

**Table 3. Key Social, Economic and Health Indicators by Gender in Tunisia**

	Gender	
	MEN	WOMEN
Unemployment <sup>1</sup> (%)	12.1	21.7
Illiteracy <sup>1</sup> (%)	12.4	25
Life expectancy <sup>1</sup>	74.5	78.1
Suicide Rate per 100000 <sup>2</sup>	4.66	1.93
Prevalence of obesity <sup>3</sup> (%)	17.6	34.6
Prevalence of depression <sup>3</sup> (%)	4.0	5.4
Prevalence of smoking <sup>3</sup> (%)	48.3	2.6
Alcohol consumption <sup>3</sup> (%)	19.5	1.3

**Note.** Data collected from multiple sources.

<sup>1</sup> (National Institute of Statistics, 2019)      <sup>3</sup> (National Institute of Health, 2019)

<sup>2</sup> (Studies and Planning Directorate-Statistics Directorate, 2019)

## MATERIALS AND METHODS

This study aims to investigate the relation between the SDH and individual health outcomes in Tunisia. Besides, our ambitious objective is to provide an evidence that this relation explains the status-quo of health disparities in Tunisia.

Public health research and especially health equity research require a vast amount of data that is why data from national and cross-sectional surveys are considered best reliable sources for this kind of analysis (Murray et al., 1999). Furthermore, to ensure that the rest of the population will behave the same way as the chosen sample, health equity analysis requires a broad population and a representative large random sample large enough (O'Donnell et al., 2008).

Thus, this analysis was performed through a literature review of relevant reports from the National Institute of Statistics (NIS), national census, health surveys and official statistics. A secondary data analysis of the Tunisian health Examination Survey (THES) 2016 was also performed after an agreement and a consent from the National Institute of Health (NIH).

The cross-sectional design of the THES-2016 was very useful for the examination and testing of our research questions. Many have noted that the cross-sectional design is a popular and reliable research design used in the social sciences and, that being non experiment enables the studying of subjects in their natural setting (Bickman & Rog, 2008; Bryman, 2016).

### Data: Tunisian Health Examination Survey - 2016

The national survey THES-2016, was conducted by the National Institute of Health with the support of the Ministry of Health and the World Health Organization (WHO) and in collaboration with the research laboratory in Epidemiology and Prevention of Cardiovascular Diseases, the Tunisian Society of 'Diabetes and Metabolic Diseases Endocrinology and the

National Office for Family and Population. The fieldwork took place between March 09 and June 30, 2016. It contained information assembled from a field national survey that used a standard questionnaire. The survey involved face to face interviews. Only adults were interviewed during the survey.

The survey was conducted with a representative sample of the Tunisian population. The sample was drawn from each of the 7 major regions of the Tunisian territory (District of Tunis, North-East, North-West, Center-East, Center-West, South-East, South-West), i.e., 750 households per region. For each household, two people (a man and a woman) aged 15 and over were randomly selected.

A total of 5079 households agreed to participate. The response rate has been estimated at 97% nationally. The THES concerned 9212 individuals.

### **Data Analysis**

Following the WHO's framework on the SDH along with a review of local social indicators that could eventually influence health led to the selection of gender, age, geographical information, education and socio-economic status represented in a poverty index as the key social determinants of health for this analysis. Health perception is a theme that is very often addressed in health surveys. Indeed, the individual's appreciation of his own state of health is considered to be one of the best indicators of morbidity, mortality and consumption of care. It is a comprehensive measure incorporating several physical, mental and social dimensions. Thus, we used personal health perception as an indicator of the health status of the studied population. Subjective health perception was defined by the answer to the question A2001 in section 2000 (Health State Descriptions): "In general, how would you describe your state of health today?". This question contains 5 propositions: very good, good, poor, bad and very bad. The first two responses are grouped under the heading "Good" and the last two under the heading "Bad".

A poverty index was constructed from information on the characteristics of the habitat as well as the capital goods of the household via a "principal component analysis" (PCA) and a classification of households in quintiles in such a way that:

The 1<sup>st</sup> quintile: is the most disadvantaged class

The 5<sup>th</sup> quintile: the most advantaged class

The data management and analysis in this study was done by the programming language and free software environment for statistical computing and graphics R 3.3.2. The results were weighted using the "svydesign" function of the R software.

Through this analysis, we aimed to examine how inequality and variations in the SDHs harms the health of populations.

As we undertook the examination of the impact of the variables (SDHs) on health status, we had to examine the social mechanisms through which health is damaged by income inequality such as low socioeconomic and educational attainment, limitation of access to health care and environmental goods, and poor nutrition. The survey's design allowed us to engage in an exercise that contrasted the lives of disadvantaged and advantaged populations. Like

Gustafsson & al (2020) and Odekina (2015), we will use statistical analysis to provide a clearer view of the role of confounding factors in the final determination of the health outcomes.

## RESULTS

This study focused on analyzing health equity in Tunisia, through looking into correlations between the SDH and self-rated health status of the Tunisian population. The variables used to evaluate the association of self-rated health status and the social determinants are *Age, poverty index as an indicator of SES, geographical region, area of residence (rural/urban) and educational attainment/literacy*.

Research suggests that health status and life expectancy are outcomes of pathological processes as well as environmental, social, and economic inequities (Braveman & Gottlieb, 2014; Cox, 2016; Marmot, 2015).

Research also suggests that these factors of health and life expectancy have unequal distribution in the society and have produced health disparities (Veenstra, 2013). The suggestion that these health determinants affect the health status and life expectancy of individuals has created a compelling ground for this study. Through assessing social and - economic inequalities.

Tunisia is located in North Africa, with a population of around eleven million (Institut national de statistique, 2019). It has a gross domestic product per capita of US \$ 10,249. In 2015, with a human development index estimated at 0.725, Tunisia is ranked 97<sup>th</sup> (United Nations Statistics Division, 2017; World Bank, 2020).

Demographically, Tunisia has experienced a transition marked by a rapid reduction in the total fertility rate, which fell from 7 in the 1960s to 2 in the 2000s. And although the population is still young, 24% are aged under 15, the share of the population aged over 65 has increased rapidly and reached 7% in 2015 (World Bank, 2020). In addition, life expectancy has improved over time to reach 75.1 years in 2015, 74.5 years among men and 77.8 years among women (Institut national de statistiques, 2018).

On the other hand, like the countries of the Eastern Mediterranean Region, Tunisia has entered the epidemiological transition characterized by a considerable increase in non-communicable diseases. The burden of these transitional diseases poses a challenge to the Tunisian health system. Non-communicable diseases, the main burden of disease, are the cause of 86% of deaths recorded in 2013 in Tunisia (Institut national de la santé, 2019).

At the root of this increase in non-communicable diseases are the adoption of new eating habits, a sedentary lifestyle, urbanization and a change in living conditions. Furthermore, regional disparities and social inequalities in health are very little documented and are now at the heart of the current debate in Tunisia.

Thus, knowledge relating to the state of health of the Tunisian population as well as that on the relationships between lifestyles as determinants of health and health status, on the one hand, and the use of benefits from the health system, on the other hand, are of great importance for health and social policy (Bauer & Scheim, 2019; Kwon et al., 2017).

### Response Rate

A total of 5079 households out of 5250 were surveyed. The response rate was satisfactory: 97% nationally. Only 3% of households refused to participate in the survey (see table 4).

Within the households surveyed, the response rate was 98.9% among people aged 15 and over. Regarding biological examinations, 3% of women and 4% of men refused to participate.

A total of 9,212 individuals were surveyed, i.e., 4,362 men and 4,850 women. It appears that the age distribution of the individuals surveyed resembles that of the Tunisian population. The average age of the population studied was  $41.4 \pm 17.4$  years, that is  $41.3 \pm 17.5$  years for men and  $41.5 \pm 17.4$  years for women.

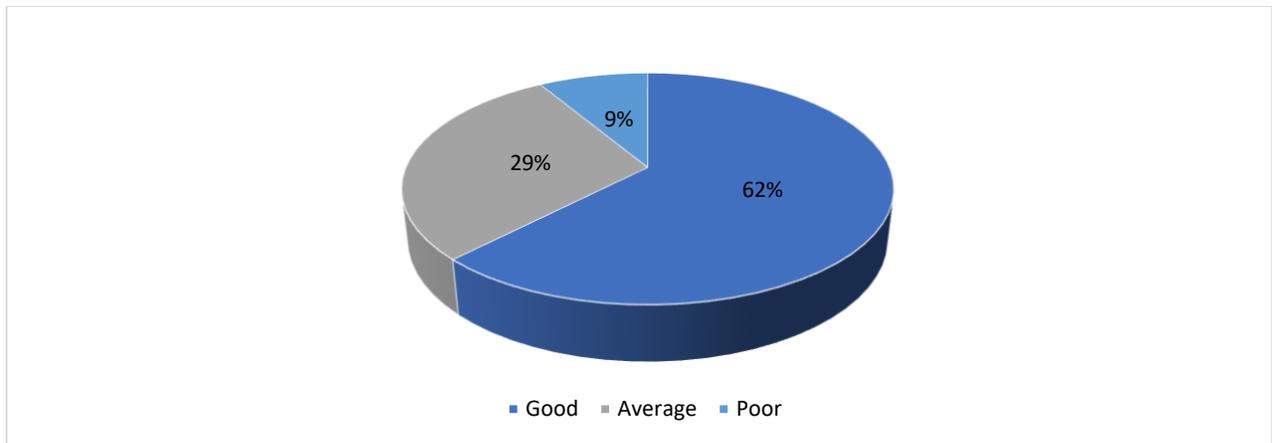
**Table 4. Response Rate Per Region**

Regions	Household		Individual	
	Acceptation	Refusal	Acceptation	Refusal
District of Tunis	709	41	1248	9
North East	732	18	1324	27
North West	735	15	1358	12
Center East	715	35	1312	23
Center West	733	17	1348	10
South East	722	28	1295	17
South West	733	17	1327	17
Total	5079	171	9212	115

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### Relationship between the variables

The figure (2) below illustrates the perception of the health by Tunisians aged 15 and over. It appears that 62.3% [61.0-63.5] of the population studied rated their health as good, 29.1% [28-30.3] considered it to be average and 8.6 % [7.9-9.3] said it was bad.



**Figure 2. Distribution of the perception of health of Tunisians aged 15 and over**

***Gender related health inequity:***

Analysis of the perception of health among women showed that 55.1% [53.4-56.9] of them qualified their state of health as good, 35.5% [33.9-37, 2] thought it was average and 9.3% [8.5-10.2] said it was bad. Otherwise, 69.6% [67.9-71.4] of men aged 15 and over rated their health as good, 22.5% [20.9-24.1] rated it as average and only 7, 9% [6.8-8.9] said it was bad (Table5).

9.3% of women rate their health status as bad against 7.9% of men. Even though the difference is minor, yet, the statistical significance of the following data suggests a link between gender and health status.

The self-rated health among women varied according to the poverty index. Indeed, the percentage of women who considered that their health was poor decreased according to the poverty index. This proportion went from 15.5% [12.9-18.0] among those belonging to the most disadvantaged class to 5.2% [3.6-6.7] among those in the most advantaged class. Also, the self-rated health status among women varied by age. In fact, 80.1% [7.3-87.8] of girls aged 15 to 18 years considered that they were in good health. This proportion gradually decreased with age: it went from 72.3% [66.9-77.6] among women aged 19-25 years to 52.5% [49.0-55.9] among those aged 40-49 years and 31.2% [27.1-35.3] in the 60-69 age group, reaching only 18.2% [14.3-22.1] in those aged 70 and over.

**Table 5. Distribution of health-status perception by gender**

	Good 95% CI	Average 95% CI	Bad 95% CI
<b>p&lt;10<sup>-3</sup></b>			
Women	55.1%	35.5%	9.3%
Men	69.6%	22.5%	7.9%

**Note. CI: Confidence Interval (P=0.05)**

**p: Statistical Significance Degree**

Furthermore, 11.9% [10.4-13.5] of women living in rural areas declared that they were in poor health compared to 8.1% [7.1-9.2] in urban areas (p <10<sup>-3</sup>). In addition, uneducated women more often complained about their health than those with higher education (22.9% [20.5-25.3])

Versus 3.1% [1.5-4,6]). The difference was statistically significant ( $p < 10^{-3}$ ). The same pattern was also observed among men with a high statistical significance.

### **Health equity assessment by Geographical location:**

As obvious in Table 6 individuals in rural remote areas perceived their health status as bad in comparison with people living in urban locations (10.55% against 7.3%).

Furthermore, we noticed that individuals who lives in the Center West and North East perceived their health to be poorer (11.6% and 9.71%) than those from the South East (4.5% [2.8- 6.1]).

80.9% from individuals living in the south eastern region perceived their health as good.

**Table 6. Self-rated health status among individuals aged 15 and over by geographical determinants**

	Good	Average	Bad
<b>Area of Residence</b>	<b><math>p &lt; 10^{-3}</math></b>		
Urban	63.35%	29%	7.3%
Rural	60.3%	29.15%	10.55%
<b>Region</b>	<b><math>p &lt; 10^{-3}</math></b>		
District of Tunis	58.45%	33%	8.6%
North East	53.35%	35.1%	11.6%
North West	58.65%	31.7%	9.65%
Center East	63.65%	28.9%	7.45%
Center West	67.1%	23.15%	9.71%
South East	80.9%	14.65%	4.5%
South West	63.85%	28.3%	7.7%

**Note. p: statistical significance**

### **Implications of Socio-Economic status:**

Data from the survey show that 15.35% of people belonging to the most disadvantaged group perceive their health as bad, while, only 4.05 % from individuals whom belong to the most advantaged population group rate their health status as bad.

**Table 7. Self-perception of health among adults by SES**

	Good	Average	Bad
<b>Poverty Index</b>	<b><math>p &lt; 10^{-3}</math></b>		
The most disadvantaged	53.57%	30.95%	15.35%
2 <sup>nd</sup> quintile	59.7%	29.3%	11%
3 <sup>rd</sup> quintile	60.6%	29.9%	9.55%
4 <sup>th</sup> quintile	65%	29.1%	5.9%
The most advantaged	69.1%	30.9%	4.05%

**Note. p: Statistical significance degree**

It is very obvious according to the data presented in table 7 above that the percentage of individuals perceiving their health as bad decrease proportionally with the poverty index. These data are statistically significant proving the existence of a correlation between health status and SES.

**Education attainment and self-rated health status**

The data from the survey as presented in table 8 suggests that the bad perception of health status is correlated with educational attainment. With a high rate among illiterate individuals at 22.85%, dropping to 9.3% among individuals with primary education, 4.5% among individuals with secondary education and reaching 2.6% among individuals with higher education.

As hypothesized above there is a significant correlation between education and health outcome. Individuals with low health knowledge that provide education are more prone to be in poor health and shape. The data also indicates a state of inequality in educational institutions distribution highlighting again regional disparities between governorates. However, the state of marginalization that big cities reached is alarming, suggesting that also the state’s preferred geographical locations are also suffering from within a great share of inequality on a multi-level.

**Table 8. Self-perception of health status by educational attainment**

	Good	Average	Bad
Education attainment	<b>p&lt;10<sup>-3</sup></b>		
Illiterate	35.9%	40.75%	22.85%
Primary Education	59.1%	31.6%	9.3%
Secondary Education	70.35%	25.1%	4.5%
Higher Education	74.2%	23.25%	2.6%

**Note. p: statistical significance**

**Health inequity: SDH interaction and intersection**

The subjective health of men similar to that of women varied according to the poverty index. Indeed, the percentage of men who considered their health to be poor fell according to the poverty index. This proportion went from 15.2% [12.1-18.4] among men from the most disadvantaged households to 2.9% [1.0-4.8] among those in an advantaged situation.

In addition, 9.2% [7.6-10.7] of men who lived in rural areas declared that they were in poor health compared to 7.3% [5.9-8.6] in urban areas. The difference was statistically significant (p <10-3). In addition, uneducated men complained more often about their state of health than those with a higher level of education (23.8% [19.9-27.8] and 2.1% [0.5-3,6] respectively). The difference was statistically significant (p<10-3).

Finally, 11.8% [9.2-14.5] of men from the North East region declared that they were in poor health compared to only 4.5% [2.8-6.2] of those in the South East, while among women, the health of women who lived in the Center West seemed to be poorer (13.2% [10.8-15.7]) than those from the South East (4.5% [2.8-6.1]).

## DISCUSSION

The secondary analysis of THES-2016 data process indicates a strong association between SDHs and inequity in health status. Indeed, the data has provided several proofs that certain SDH is causing health inequity in Tunisia as proposed in the case analysis in Ariana by Ben Romdhane and Grenier (2009).

This association has been already proven in many countries according to the findings of the academic research (Gustafsson et al., 2020; Hankivsky et al., 2017). The relation between SDHs and health inequities in Tunisia is present on many levels. The socio-economic inequality and the unjust distribution of wealth between regions is hugely affecting the health of the population.

Few studies in Tunisia if none has explored the effect of the SDHs on the overall health status of the population. Our study proved the existence of a link between health disadvantage and social inequalities. Geographical and Regional inequalities is the most obvious form of social inequality and it is having a big effect on the health status of individuals. The SES can also be considered as a key determinants of health outcome. The patterns of inequality in health status between different social classes has been proven by the findings of the following study.

Education has long been perceived as a social elevator in Tunisia, since it has a great impact on the SES of individuals. That is why we saw that a big portion of illiterate individuals belonging to the most disadvantaged group in society and perceiving their health as bad. While, individuals with higher education and aged over 40 belong to the most advantaged class and perceive their health as good. Not only that education has an impact on SES but also it has an impact on people's culture and knowledge which lead them to a higher attendance to healthcare facilities.

Age wasn't with big relevance to the study since its effect was minor compared to other variables like geographical location, gender, education and SES.

As noted by Boutayeb and Helmert (2011), we found that regional disparities have a great impact on creating social inequality which results eventually in deepening the health equity gap in Tunisia.

The World Bank 's 2020 report indicated that the national State in Tunisia always prioritized the coastal governorates in implementing development plans. Furthermore, the rural areas have been always excluded from any development intervention by the state throughout its history.

Masculinity and femininity as a social construct, also known as the set of attributes, behaviors, and roles associated with gender, remains a key source and ground for health inequity in Tunisia affecting both genders. This correlation is based on the social expectations from both genders, resulting in high morbidity and affecting life expectancy and overall health (Hankivsky, 2012).

According to Asada (2005) quantifying health is the main problematic issue confronting health equity analysis and the influence of SDHs on it. Some scholars depend solely on self-rated health

as an indicator of the overall health status. However, there is a general consensus that self-rated health is not always true. The perception of a person on his own health could be influenced by many factors, mainly social and psychological. Thus, an ambitious effort is underway by several scholars to propose better models to quantify health taking into account biomedical markers such as the work of Hankivsky & al (2017) and O'Donnell & al (2008).

The social determinants don't affect health separately, but rather their collective influence is the reason behind creating health inequity. That collective influence is called in social sciences "Intersectionality theory". Although academic research has made substantial progress in understanding the 'social determinants of health', unfortunately, the traditional approach results in problems related to poor understanding of the structural and systematic nature of health inequities (Marmot, 2015).

That is why Bowleg (2012) point out the need of an intersectional and interdisciplinary theoretical framework to provide a critical, insightful and a unified understanding of the nature of health equity and how multiple social identities contribute in its implementation.

### **CONCLUSION**

In order to improve health equity in Tunisia given the spread and emergence of non-communicable and chronic diseases that affect a big portion of the population, government health policies should urgently include, in addition to a profound reform of the health system, several measures to improve the health of the vulnerable and disadvantaged portion of society especially after the political and constitutional reforms that made healthcare access and the right to life a constitutional right. These measures should be taken through addressing key SDHs relevant to the social context in Tunisia.

The current body of knowledge holds the social determinants to account for its impact on population' health. So much work has gone into exploring the associations of social determinants with physical and psychological health around the world. However, in Tunisia not much work has been reported in respect of the social determinants of health and their contribution to population's health, instead, an academic and political focus on healthcare and healthcare delivery. A reality that reflects a diseased-centered paradigm with regard to public health in Tunisia rather than a patient-centered paradigm. The central message that emerged from this preliminary work is that societal and economic variables that were hitherto considered as influential determinants of health outcomes in the developing countries were found to be also significant in determining the health status of Tunisians and are also culpable of the status-quo of health inequity in Tunisia. This supports the fact that evaluating the social determinants of health is salient for research as every life lived and lost is influenced in part by the social factors and in part by other factors.

The findings from this study are considered to be only preliminary findings from a secondary data analysis of the THES-2016, building upon this work and exploring the intersectional pattern of SDHs and its impact on health equity is our main task. A health status that should be measured using multiple variables that could reflect the real health status in a more objective manner using a principal components analysis.

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