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# Measuring health inequalities: Some application in Marche region

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## 1. Introduction

The term “health inequality” generically refers to differences in the health of individuals or groups. Any measurable aspect of health that varies between individuals or social-relevant groupings can be called a health inequality. Absent from the definition of health inequality is any moral judgement on whether observed differences are fair or just. By contrast, a health inequity or disparity is a specific type of health inequality that denotes an unjust difference in health. It is arguable that when health differences are preventable and/or unnecessary, allowing them to persist is unjust.

The monitoring of inequalities in health is an important public health task. Interest in health inequalities amongst EU countries and their regions, as well as amongst the various social clusters in the EU population, is growing.

As a consequence, the search for the best appropriate “summary measure” of health inequalities, that can be observed individually or in terms of groups of individuals, is a task that occupies a lot the researchers involved in related fields.

Lately, in the EU, it has been recognized that a more focused effort is required. Of course, it is natural to suggest and construct methodologies, or indices, that are suitable for assessing trends in mortality, morbidity and self-perceived health. However, the selection of an appropriate indicator or measurement methodology to evaluate and monitor health inequality across the EU-27 countries is a demanding task. This is because each available indicator has advantages and disadvantages. Simple indicators are usually comprehensive but may not have some specific desirable characteristics. Other indicators are more technical and difficult to understand, apply and/or interpret; but can be of more assistance in explaining significant components of the concept of “health inequality”. Complex indicators can also be very useful for breaking down the factors and issues relating to inequality. Based on the above, it is reasonable to state that the main goals of our study are the following:

- to present the principal models depicting the wider determinants of health;
- to propose appropriate measurement methods in the form of indicators that can estimate and capture the level of inequality in a population.
- to present some important results of the measures proposed to assess health inequalities in the Marche region, and in other contexts, using existing and available data.

## 2. Principal models able to explain the social determinants of health

The primary social determinants of health are the circumstances in which people are born, grow up, live, work and age; and the systems that are in place to deal with and prevent illness.

The concept of social determinants of health may be useful to explain how social inequalities can be transformed into health inequalities. Age, sex and inheritance are clearly important factors, but researchers have highlighted that other such determinants include: socioeconomic factors (i.e. education, job status, family/social support, income, community safety...); physical environment; health behaviours (i.e. tobacco use, diet and exercise, alcohol use, sexual activity...); access to care; and quality of care.

The most important models that present the determinants of health are the following:

- Whitehead and Dahlgren model (1991);

- Pathway model (or of the causes of the causes) by WHO Commission of social determinants of health (2008);
- Duran and Pérez-Stable titled of “Relationship between health determinants and health disparity outcomes” (2019).

### 3. Presentation of the most suitable summary measures for monitoring health inequalities

The distribution of a health variable can be described in terms of various statistical measures: its central tendency, dispersion, range, etc. This are univariate measures. Frequently, the term “health inequality” is use incorrectly from a statistical point of view, as the objective is to quantify the relationship between a variable (e.g. gender, race, a socioeconomic characteristic etc) and health, to determine the projected impact of the distribution of this variable on the health of the population. This, therefore involves bivariate measures.

To better identify the main measures, we can take into consideration the following schemas:

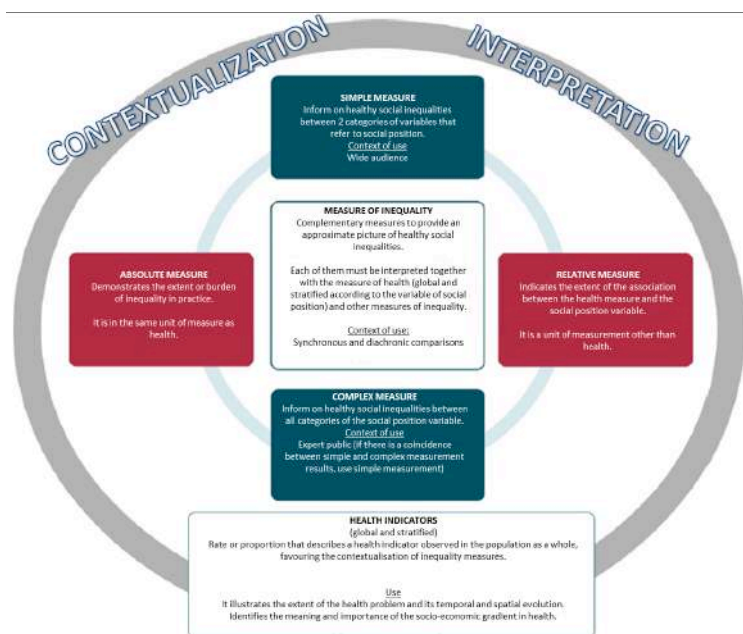


Figure 1: Institut national de santé publique di Québec (2017) - How to use SSISSQ to study social inequalities in health, Version 1, Bureau d'information et d'études en santé des populations

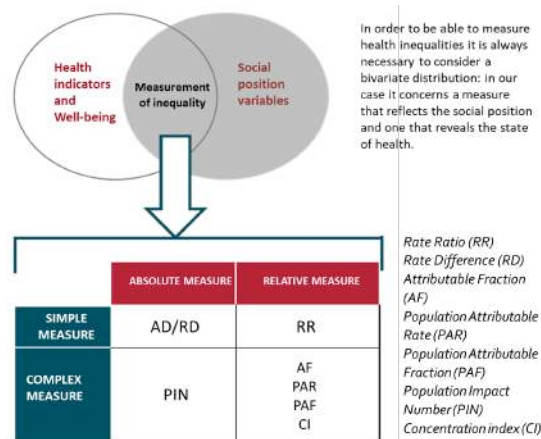


Figure 2: Institut national de santé publique di Québec (2017) - How to use SSISSQ to study social inequalities in health, Version 1, Bureau d'information et d'études en santé des populations

## 4. Methodology

Data to populate the model were derived from the following sources: Health for all (WHO, 2018); the Italian National Institute of Statistics (ISTAT) (2019), which is the main producer of official statistics in Italy, provided national mortality, life-expectancy and cause of death statistics; Passi (Progress of Health Companies in Italy; 2018), Passi d'Argento Population Surveillance System (2018); sentinel events using physician databases; hospital discharge forms; CENSIS (2018) databases; and databases of the Local Health Authority investigated. The data used was for primarily 2017.

As it can be seen in Table 1 and Figure 3 the measures used in our research are absolute difference and rate ratio for some of the data collected, because they are more useful for wide audience, while concentration index was used to compare health status between the higher and the lower socioeconomic categories because the context of use is for a expert public.

## 5. Results

	Regional value	Value in lowest social group (low educational level)	Value in highest social group (high educational level)	Absolute/Rate difference
<b>General health status</b>				
Life expectancy in men (years)	81,1	80,3	83,4	3,1
Life expectancy in women (years)	87,1	86,6	89,8	3,3
Healthy life years in men	40,5			
Healthy life years in women	38,27			
% of the population that assess their health as good or very good	70%	65,9%	74,7%	8,8%
<b>Accessibility of care</b>				
Breast cancer screening (% women aged 50–69)	71,8%	65,90%	77,80%	11,90%
Autonomous breast cancer screening	29%			
Organized breast cancer screening	51,60%			
Cervix cancer screening (% women aged 25–64)	79,7%	76%	83,4%	7,4%
Autonomous cervix cancer screening	27%			
Organized cervix cancer screening	56,20%			
Delayed contacts with health services because of financial reasons	15,3% - 7,6%*			

\* divided into people with limitations and without limitations

Table 1a: Summary of socioeconomic inequalities for selected indicators in the Marche region

	Regional value	Value in lowest social group (low educational level)	Value in highest social group (high educational level)	Rate difference
<b>Appropriateness</b>				
% of adult diabetes patients (aged 25+)	3,8%	5,4%	2,3%	3,1%
<b>Health promotion</b>				
% of the population that reports to smoke daily	19%	17,4%	20,5%	3,1%
% of the adult population considered as being obese (BMI ≥30)	9,5%	15,2%	10,1%	5,1%
% of the adult population considered as being overweight or obese (BMI ≥25)	31,5%	35,8%	25,8%	10%
% of the population reporting to eat at least 200 g vegetables and 2 fruits per day	77,3%			
% of the population reporting to practice at least 30 min of physical activity per day	9,1%	7,5%	16,6%	9,1%

Table 1b: Summary of socioeconomic inequalities for selected indicators in the Marche region

Through the use of simple measures, social disparities are observed in general health status, accessibility and appropriateness of care, and health promotion (See Table 1).

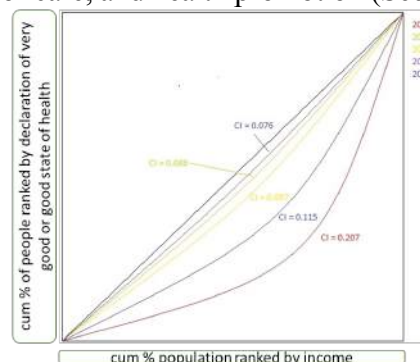


Figure 3: Concentration index: application in the Marche region

Figure 3 shows the Concentration Curves for the Marche region relating to the 5 years where there was a statistical significance in the results of 95% or higher. It suggests that the Concentration Index calculated for the region is relatively stable. It is therefore inferred that perceived good and very good health in Marche tends to be concentrated among those who have a higher socioeconomic status. This serves to emphasise that tackling health inequalities remains a very important issue.

## 6. Conclusions

The issue of social inequalities and health is a key public health issue. Its inclusion is essential for health policies to be effective at different levels (national, regional, local), as well as for the implementation of health improvement programmes and action for health education among the population. The approach and use of models and principal indices, described in this paper, have been successfully applied to estimate (the significant) health inequalities in the Marche region, particularly in relation to rate ratios and the concentration index.

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