Unfair inequalities in health and health care: a critical appraisal

Abstract
There are many factors can influence the inequalities in health care, for example is unequal opportunities in education or employment. It is believed the social determinants of health are causal factors for which inequalities are unjust. Measuring causal variables in this context requires measuring unfair inequalities which implies the distinction categories of variables: namely legitimate effort, legitimate circumstance, illegitimate effort, illegitimate circumstance. The lifestyle is a classic example of inequality as legitimate circumstance because the population can choose. Evaluate measures so as unjust inequality measures in health and care delivery is necessary because the distribution of the variables may reflect fairness. The aim of this study therefore was to reflect on the methods of measurement the inequality for health care. It is an analysis of these methods as the persistence of unjust inequalities no longer exclusively the countries of the "third world" or "developing." Our conclude that there are various methods of analysis the unfair inequalities in health and health care but the method of multivariate analysis is more appropriate to allow different ethical positions.

Keywords: Equity in health care delivery; Health inequality; Social welfare

BACKGROUND

Even though inequality measurement *per se* is a multivariable phenomena (Fleurbaey & Schokkaert, 2012), the methods commonly applied to health and health care consist of partial approaches, that is, approaches that select the most relevant variables to be considered and frame them for comparison purposes in uni- or bivariate models[1]. The partiality of the approaches is exactly one of the shortfalls presented by Fleurbaey and Schokkaert in their paper "Unfair inequalities in health and health care" (2009). In the paper, the authors aim to present a new (and somewhat novel) multivariate framework. They clearly draw inspiration from the inequality of opportunity literature, although, as discussed in this essay, some adaptations may be required, especially for the case of health care. This essay discusses not only the framework as proposed by Fleurbaey and Schokkaert, but also some implications of its application and possible shortfalls of the method.

Inequality of Opportunity Framework

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[1] By no means multivariate approaches can be considered all-encompassing and final. They do, however, take into consideration more variables and, by consequence, more sources of inequalities.

Amongst others, the literature on inequality of opportunity aims to build models that take into consideration several sources of inequality. When applied to Health Economics, the basic idea behind inequality of opportunity is that amongst the factors that influence people's health status or health care use, some derive from personal choice, and can, thus, be considered fair, while other are beyond an individual's scope of action. These later factors can be considered unfair. That is to say, if a person has a poorer health status due to the fact that he or she smokes, for example, that should not be cause for concern as smoking is a personal choice and the not-as-healthy status is then only fair. On the other hand, someone whose health status is very good due to a very wealth parental endowment has a clear unfair advantage, once no child chooses the family in which he or she is born.

The earliest approach in for modelling inequality of opportunity was proposed by Roemer (1993, 1998, 2002) and considers that a person's advantage or success (y_i) is determined by a vector of illegitimate factors, the circumstances (c_i) and a vector of legitimate factors, the effort (e_i). Note that this framework already incorporates the level of productive technology as well as any redistribution that is brought through the existing institutions of the relevant community (Fleurbaey & Schokkaert, 2012).

$$y_i = y\,(c_i,\ e_i)$$

In this terminology, two individuals at the same level of effort should obtain the same degree of success, otherwise inequality of opportunity exists. Even though Roemer's original model establishes a monotonic relationship between health and the variable(s) of interest to define the individual's rank position in the distribution, this is only one possible approach, and several others have emerged in the literature (Fleurbaey & Schokkaert, Op. Cit). Nonetheless, the general framework remains.

An important feature of the framework is the distinction between "effort" and "circumstance" as sources of fair or unfair inequalities. In general terms, inequalities between groups are considered fair or legitimate if they derive from natural circumstances (e.g. demographics) or are a result of choice (e.g.

lifestyle), from which an individual is considered responsible[2]. In opposition, illegitimate or unfair sources of inequality include any circumstance that lies beyond the individual's control, including parental endowments, physical environment, access to health care services, etc (O'Donnell et al., 2012). Despite the importance of knowing, and hence, measuring total inequality, it is unfair inequality that requires greater attention and concern, once they produce a relevant social loss and are ethically objectionable. That is exactly the position of the authors in the paper reviewed.

Fleurbaey and Schokkaert Framework (2009)

Consistent with the economic rationale of utility maximization, Fleurbaey and Schokkaert (2009) have proposed a model in which an individual's health is determined by his/her medical consumption (m_i), consumption goods (c_i), including lifestyle (e.g. smoking), the genetic health endowment (e_i), a stochastic health shock (ε_i), job characteristics (o_i), including leisure and social background (s_i).

$$h_i = H\ (m_i,\ c_i,\ e_i,\ \varepsilon_i,\ o_i,\ s_i)$$

Note that in this model some variables within the categories can be considered circumstances, whereas others may be regarded as effort[3]. Given a budget constraint, the health outcome for the individual *i* will be a result of a multiple equation maximization problem. Dias and Jones (2009) propose an even more general version of this model, in which health is also determined by multiple factors but individuals are not necessarily utility maximizers.

Direct Unfairness and the Fairness Gap

In their framework, one of the central issues addressed is how to move from the measurement of overall inequality to unfair inequality only. Two

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[2] Later in the essay, we discuss whether it is appropriate to consider natural circumstances fair and whether the terminology "circumstance" and "effort" can be transposed to the case of health care.

[3] For example, someone's job is determined by this person's level of education, which might be considered circumstance as a child has no responsibility whether his/her parents send them to school, and the level of desired leisure, which should be considered effort, as some high-profile positions demand less spare time.

methods have been proposed to resolve this issue, namely i) direct unfairness and ii) fairness gap.

In general terms, direct unfairness establishes that "a measure of unfair inequality should not reflect legitimate variation in outcome, i.e. inequalities which are caused by differences in responsibility variables" (Fleurbaey & Schokkaert, 2009, p. 75). In other words, legitimate differences should not influence the inequality outcome. This technique, also known as conditional equality, eliminates the fair sources of inequality by correcting the outcome value (in the case of health, $\tilde{h}_i$). In other words, it builds an artificial distribution, in which the legitimate sources of inequality have no influence.

By contrast, the fairness gap uses the principle of compensation [4] to obtain egalitarian equivalence, that is, when or if a "measure of unfair inequality is zero, there should be no illegitimate differences left" (Fleurbaey & Schokkaert, Op. Cit, p. 75). As a result, two people with the same value for effort (i.e. variables for people can be held accountable) should obtain the same outcome.

Even though both approaches are valid to deal with illegitimate sources of inequality, they do not yield the same results. The picture below illustrates.

Suppose we are looking at two groups of individuals (Group A and B) with different lifestyles. Group A is composed of "healthy lifestyle" individuals (e.g. people who are non-smokers, with a healthy diet etc.) and can be considered healthier overall. Let h^a be the health function for group A and h^b the function for group B, in terms of a variable y deemed to represent an unfair source of health inequality, such as income. The measurement of direct fairness is done by fixing a lifestyle reference value – in this case, setting both Groups equal to the "unhealthy lifestyle" reference value of Group B – which yields a health of x at the mean income value of y*. Comparing the distance between the curve for Group B and the reference line x will then give us a "direct fairness" measure of inequality. In the figure, if we focus on group B, the striped area gives us a "direct fairness" measure of inequality (Fleurbaey & Schokkaert, Op. Cit).

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[4] The principle of compensation defines that all inequality must have been compensated, or accounted for, if the unfair inequality measure is zero.

Figure 1 – Direct Unfairness and Fairness Gap
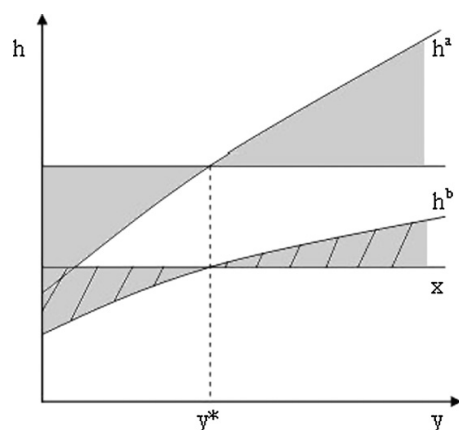
Source: Fleurbaey & Schokkaert, 2009.

This method has the obvious pitfall of completely neglecting the unfairness existing for group A, although it does satisfy the conditional equality principle[5]. In the fairness gap method, on the other hand, we would fix a value *y* – in the case illustrated above, the mean income of y* - and then take into account each individual difference, that is, calculate the gap between the individual's actual health status – a point the curve h^a or h^b - and the health status she or he would achieve if all unfair differences were removed. Here the shaded areas of the chart represent the size of inequality. Nonetheless, the fairness gap method also has the pitfall of taking into consideration the difference in slopes of each group, whereas ideally, we would like to neutralize such effect, at least in the analysis for health, as they represent differences in lifestyle. As both principles of conditional equality and egalitarian equivalence are important in the measurement of unfair inequality, one may consider the direct fairness a lower bound measure and the fairness gap, an upper bound one. As to which method is preferable, it is clear that the fairness gap might be preferable as it satisfies the compensation principle. However, if there is reason to believe that difference in lifestyles impact health differently for different socioeconomic groups, one might consider the direct

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[5] The conditional equality principle determines that inequality derived from different choices (individual conditions) is acceptable, i.e. so long as individuals can be held responsible, inequality between groups may occur and not be a source of concern.

fairness method more adequate, as it places greater weight on personal choice and responsibility.

Transposition of the general framework applied to health care

Although the framework previously explained can be applied to health and health care, due to the nature of the empirical work to be persued, the application for health care deserves better consideration as the terminology might be misleading.

Consider a health care function in the form hc(*il*, *lg*), where *lg* denotes variables that produce legitimate inequalities in health care, and *il* corresponds to illegitimate-type variables, which bring about ethically objectable inequalities. For the purpose of the framework, let *lg* variables stand for need and *il* for everything else. In this case, a general formula for the health care function states:

$$hc(il_i, lg_i) = hc_i = hc\,(hn\,(SES_i,\,d_i,\,P^1_i),\,SES_i,\,d_i,\,P^2_i)$$

In this function *hn* stands for health care needs, which depends on socioeconomic status (SES_i), demographic variables (d_i) and lifestyle preferences (P^1_i). Note that the model establishes that health care is also a function of differences in treatment preferences (P^2_i). The formula above has the interesting feature of allowing for the distinction between the direct effect of socioeconomic variables in health care, and its indirect effect (the one that passes through health care needs).

Traditionally, the socioeconomic inequality literature establishes that *il* = *SES* and *lg* = (*d, P¹, P²*). This approach, however, has the disadvantage of disregarding the effect of socioeconomic variable on health care needs. Thus, as Fleurbaey and Schokkaert (2009) have proposed, it may be more interesting considering *il* = *SES* and *lg* = (*hn, P¹, P²*). The correlation that arises between *il* and *lg* means that a simple "inequality of means" perspective cannot be used, unless properly standardized (Fleurbaey & Schokkaert, 2009). Nonetheless, it is important to highlight that considering *il* = *SES* is only one possible ethical approach, several other normative decisions are possible.

Assuming that there is an ideal level of health care, which does not depend on the socioeconomic status of the individual, we have:

$$h c^* (h n_i, P^2_i, d_i)$$

The advantage (or disadvantage) of individual i is given by the gap between the health care he actually receives and the ideal one.

$$\Delta_i = h c_i - h c^* (h n_i, P^2_i, d_i)$$

The measure of the individual (dis)advantages can be seen as a measure of illegitimate inequality. The same methods of fairness gap and direct unfairness can be calculated for the health care case. For the fairness gap, one needs to establish a reference value for il, in other words, the socioeconomic status that is considered to receive treatment the best possible way, or that is closer to the optimal health care value. In such case, the inequality measure will be given by:

$$h c_i - h c (h n_i, SES_{ref}, d_{ref}, P^2_i)[6]$$

Alternatively, one could evaluate the advantage or disadvantage of individuals given an effort level, that is, fixing all variables that derive from preference and choice. In this case, we would obtain the measure of direct unfairness. Again, once the measure of direct fairness does not satisfy the compensation principle, it cannot provide an adequate measure of horizontal inequality. Indeed, Fleurbaey and Schokkaert argue that for the case of health care, the fairness gap is the most adequate measure of inequality, once it takes into account the slopes of the curves of each individual or group. Whereas we would like to neutralize such slopes for the case of health outcome (because they reflect lifestyle), for health care they illustrate different needs, which must be accounted for in a good measure of horizontal inequality. Figure 2 below demonstrates this argument.

Figure 2 – Slopes: Preferences and Needs

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[6] Note that this measure satisfies horizontal inequality, but not vertical one, which might be of interest when studying the Brazilian reality as equity is vertically defined by the legislation.
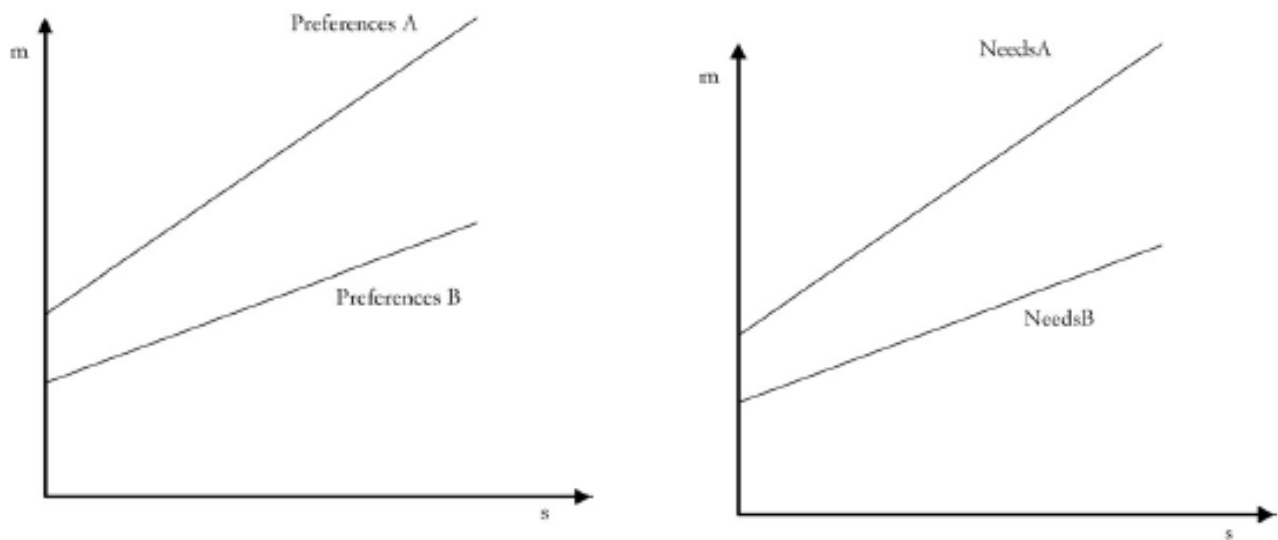
Source: Fleurbaey & Schokkaert, 2009.

Legitimacy and Circumstantiality

The previous section has described how easily the framework proposed by Fleurbaey and Schokkaert can be transposed to the analysis of health care. Nonetheless, in the transposition there was no mention to the original circumstance and effort terminology. The reason for that is that in this latter case, the original terminology may be misleading.

In the inequality of opportunity framework, all circumstantiality is considered unfair. By opposition, every effort variable is defined as fair. In health care, however, one may think of circumstances that are fair, while others are not. In reality, if one wished to categorize all variables of interest within the categories legitimate / illegitimate and effort / circumstance, the end result would be four different categories of variables, namely legitimate effort, legitimate circumstance, illegitimate effort, illegitimate circumstance. The table that follows presents the matrix of this mix. It also provides one example for each of the four subcategories.

Table 1 – Fair/Unfair vs. Circumstance/Effort Matrix

	Fair / Legitimate	Unfair / Illegitimate
Circumstance / Constraint / Non-choice	(1) e.g. Need (Age)	(3) Childhood Income
Effort / Preference / Choice	(2) e.g. preference for treatment for which the individual is held responsible.	(4) e.g. preference for treatment for which the individual is not held responsible - example due to socially entrenched low health expectations

Legitimate *vs.* Illegitimate: where to draw the line

As mentioned earlier in the essay, in general, researchers and policy makers may consider any variable over which an individual has no control a source of unfair inequality. However, the line between legitimate and illegitimate sources of inequality is not always so straightforward. So examples may be enlightening.

Let us consider the variable age. It is obvious that no one has any control over the aging process and, in health care, it is expected that young infants and older people have a greater need for care. Especially in the case of the elderly, it is far from debatable that their health status is, on average, poorer than the ones of their young fellows. Thus, hardly any one would consider placing the variable age in the effort category.

If we all agree that age is a circumstance, we must all admit that it is a source of unfair inequality. However, pure logic would tell us that if we are all subject to aging, we could all expect our health status to deteriorate over time. So, how much is aging really an illegitimate source of inequality? Some may consider it legitimate, as it simply means that the greater the age, the greater the need for health services.

Another interesting variable is smoking. The act of smoking is a choice the individual makes, and therefore, something he or she should be held responsible for. The placement of the smoking variables amongst effort variables is a common practice within researchers. As an effort variable, smoking is considered a legitimate source of inequality, as it is only fair that someone who smokes has a higher probability of falling ill.

Notwithstanding, in economic research we have enough evidence that shows that the smoking habit is one highly influenced by parental decision, over which an individual has no control. Not only that, descriptive statistics also show that a high proportion of smokers start the habit at the early ages of adolescence, a time in which as non-adults they cannot be legally held responsible for many of their actions.

In a nutshell, whether a variable is considered legitimate or illegitimate is a normative decision that falls in the researcher's hands. As in any modelling, the aim is to be as close to the reality as possible. But the perception of the reality may vary in accordance to political, sociological and economic interests. Interestingly enough, the multivariate methods here described allow for different ethical positions and this could be considered one of the greatest advantages of the method proposed by Fleurbaey and Schokkaert. It does not implicitly sets the norm. Rather the reference values must be explicit beforehand and, thus, different normative decisions regarding the placement of variables under fair and unfair are possible.

Conclusion

The aim of this study was to evaluate the methods of measurement of inequality for health care. Note that partial approaches are used, some modeling variables for comparison purposes in uni-or bivariate models, and this method has been criticized because the inequality must be a multivariate measurement.

Therefore, the approach most advantageous according to literature is the multivariate analysis because it allowed different ethical positions and perception of reality of each population, and may vary according to political, sociological and economic.

The analysis of inequality of opportunity it is considered fair and unfair, categorizing the variables of interest within the categories: namely legitimate effort, legitimate circumstance, effort illegitimate, illegitimate circumstance. As seen, four different categories emerge from the merge of the dualities, which may result in a more complex system of equations to measure unfair inequalities in health care.

It is observed that some authors proposing a measure of overall inequality in health and health care, as opposed to a measure of socio-economic inequality and could be more importantly, transposing the analytical framework of the traditional inequality of opportunity framework to the case of health care. The demonstrated through out this essay, some adaptations are required.

Empirically, the measures of fairness gap and direct fairness have not been systematically applied to the reality of developing countries. This could be of particular interest to the author of this essay, as in Brazil the rare measures existing are bivariate and have a socio-economic nature. This justifies the choice of the paper discussed. And as choice, it is fair.

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