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# Social class: concepts and operationalization models in health research

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## ABSTRACT

This article discusses the use of the concept of class in health research, different sociological approaches to social stratification and class structure, and the explanatory potential of the class concept in studies on social determinants and health inequalities. It also elaborates on the operationalization models that have been developed for use in sociological, demographic, or health research, as well as the limitations and scope of these models. Four main operationalization models were highlighted: the model developed by Singer for studies on income distribution in Brazil and adapted by Barros for use in epidemiological research, the model of Bronfman and Tuirán to study the Mexican demographics census and adapted by Lombardi for epidemiological research, the model proposed by Goldthorpe for socioeconomic studies in the UK and adapted by the Spanish Society of Epidemiology, and the model proposed by Wright for research in sociology and political science, which has also been used in population surveys in health. In conclusion, each of the models presented is consistent with their underlying theoretical concept, precluding the selection of one model over the others.

**DESCRIPTORS:** Social Class. Social Conditions. Models, Organizational. Social Sciences. Health Surveys.

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## INTRODUCTION

In the 1970s, in view of the economic processes that led to the rapid growth of income inequality and new forms of social exclusion, social scientists sought to formulate operationalization models for the concept of social class that could be used in empirical research aimed at accurate documentation of these phenomena.<sup>9,20,26,27</sup>

The operationalization of the concept of social class has gained prominence in Latin America and has led many researchers to develop operationalization models for use in empirical research in the field of health care.<sup>1,11</sup> However, in the 90s, conceptual and methodological difficulties decreased interest in the topic.<sup>21</sup>

Social dynamics has itself reestablished the importance of social class analysis. Factors such as globalization, increase in risk situations due to the erosion of welfare protection and restrictions imposed on social policies such as job security, minimum wages, social security, universal health systems, and others eventually reintroduced concern on social inequalities. In the last decade, an interest in the study of social determinants and formulation of public policies that can effectively decrease social inequalities in health reopened the discussion on the use of social class concepts as one of the key elements in the process of social reproduction.

Despite the general improvement in health status in high- and middle-income nations and the increase in public and private spending on health, social inequalities have apparently not decreased.

Social class is a key category for studies on social determinants of health-disease processes, considering that health risks tend to accumulate at different rates according to social class and position in the social structure. The better the class position in the social scheme, the greater the likelihood that class members will enjoy longer and healthier lives.<sup>22</sup> On the other hand, socially disadvantaged groups in the social structure face a disproportionate burden of injuries, illnesses, and death compared with better positioned groups.<sup>2</sup>

Undeniably, class position determines many aspects of material life by defining access to and possession of material resources, everyday life activities, and vulnerability to numerous determinants of health and disease. Furthermore, class position influences the perception of health problems and the search for solutions.

This article aims to highlight the relevance of the concept of class to epidemiological studies. It analyzes differences between social stratification (functionalist approach) and class structure (comprehensive or dialectic approach), discusses the theoretical density of empirical health research concepts, lists the main

operationalization models available, and indicates the limitations and scopes of the empirical use of the concept in health research.

## ARGUMENTS IN FAVOR OF THE USE OF SOCIAL CLASS CONCEPTS IN EMPIRICAL RESEARCH

The sociologists Wright and Goldthorpe developed the most renowned conceptual and operationalization models of social class in contemporary sociology for use in empirical research.<sup>18</sup>

According to Wright,<sup>29</sup> perhaps the most important issue in contemporary sociological research, for which class analysis can provide relevant answers, is related to inequalities in opportunity and material living standards. According to him, almost all current sociological schools of thought have explored class analysis, although the concepts may be different in each of these traditions of thought.

Wright<sup>27</sup> emphasizes the need for empirical research as a valuable resource to explain social phenomena and argues that quantitative research may be useful outside the tradition of functionalist sociology. He also claims that the Marxist theory can generate real world propositions that can be studied empirically using both quantitative and qualitative approaches.

For Wright,<sup>27</sup> there are several modes of determination, such as concepts or theoretical categories, and empirical phenomena, which can be organized into models. These models are schematic representations of the interactions between modes of determination in a given structural process. Moreover, these models can be viewed as symbolic maps or structured wholes used to mediate the knowledge of reality. In later work, Wright<sup>28</sup> returned to this topic, using Bhaskar formulations to emphasize the importance of empirical research. Bhaskar had established an epistemological position that was intermediate between naive realism and idealism and had proposed a distinction between three domains of reality, namely the real, the actual, and the empirical, and these corresponded to three ontological categories, namely mechanisms, events, and experiences, respectively. Mechanisms generate events, and together with specific conditions of perception and observation, create experiences. Therefore, theories are regarded as preconditions to understand empirical regularities and reveal the importance given to the formulation and operationalization of concepts.

Wright restates his goal to formulate a class structure concept that can be used in the analysis of microsocial processes, i.e., processes applicable to the study of

everyday life. The operationalization model is designed so as to comprehend class structure, which is a real mechanism that exists independently of the theory used to study it.

Goldthorpe and Marshall<sup>6</sup> start from a Weberian conception of social class, and stress the importance of class analysis in the study of the relationship between class structure and social mobility, social inequalities, and social action. For these authors, class analysis is a research program that can perfectly incorporate distinct sociological theories.

Class conditions affect material interests, life experiences, and the capacity for collective action. It allows access to productive resources and shapes work and consumption experiences, leading to second-order effects on health, attitudes, tastes, etc.<sup>18</sup> Clearly, social inequalities cannot be reduced to class inequalities, but class relations play a decisive role in the modulation of other forms of inequality such as ethnic and gender inequalities.<sup>19</sup>

It is precisely in this perspective that class concepts can be useful in epidemiological studies, in which one attempts to explain the social inequalities and identify the effects that class position can have on different health-disease aspects at the population level.

### DIFFERENT SOCIOLOGICAL APPROACHES IN CLASS ANALYSIS: STRATIFICATION VS. CLASS STRUCTURE

All forms of social class analysis can potentially contribute to a better understanding of the microsocial and macrosocial processes involved in the production of social inequalities.<sup>30</sup> Social inequalities can be studied in attributive or relational terms, focusing predominantly on attribute distributions or structural processes of social reproduction.<sup>7</sup>

Many class analysis theorists make distinctions between stratification and structure concepts, reserving the term stratification to approaches that identify classes on the basis of attribute distribution and material conditions and defining the boundaries of the strata more or less arbitrarily or through statistical measures of distribution. That way, the class concept would correspond to a cluster of economic and social attributes. The terminology used in stratification models usually differentiates between upper, middle, and lower classes in line with the method of cluster construction and on the basis of the position of individuals in a rank of continuous values. From a theoretical standpoint, these approaches are most useful for descriptive purposes.<sup>7,13,30</sup>

A variant of the stratification concept is the classification based on occupational clustering. This type of

class analysis is based on Durkheim's concept of labor division. The occupational groupings correspond to certain lifestyles, consumption practices, group associations to fight for common interests, and subjective perceptions, among others. The classification is based on the identification of "units of occupation", i.e., a set of technically similar activities institutionalized in the labor market through trade unions or associations. The classification is also based on the requirement of certain licenses or credentials (titles), skills, and other characteristics.<sup>8</sup> In this sense, the choice of occupational groups as a classification category would have more explanatory power compared with variables such as income, education, wealth, and material possessions.

The approaches by Weber and Marx analyze classes as a result of structural social relations, i.e., the position of individuals in the class structure is inherent to institutionalized social relations and does not correspond to grading on a scale. In these approaches, classes are qualitatively distinct groups.

Weber<sup>4,7,30</sup> believes that the market is the main determinant of economic and social opportunities for individuals. Labor market relations define the class structure, whereas other social relations, which distinguish individuals on the basis of educational credentials, ethnicity, gender, and religion, define the hierarchy of status.

Weber<sup>4,7,30</sup> suggested that four basic classes can be empirically identified in Western capitalist societies. The first distinction is between those who own the means of production and those who do not. The second division depends on the property type and the service type offered in the market. The resulting scheme comprises entrepreneurs (major owners of the means of production), the small bourgeoisie (smallholders), workers with academic credentials, and individuals whose only asset is their own labor. These positions in the class structure are added to those arising from status hierarchies and can shape the social structure, which determines the set of economic and social opportunities for the class occupants.

In the Marxist tradition of class analysis, the mechanisms of domination and economic exploitation are considered to be the main determinants of the resulting social structure. Exploitative relations establish a bond of mutual dependence between the exploiters and the exploited, which is the basis of class relations. Exploitative relations are fundamental to the social reproduction process, determining not only the position of individuals in the production process but also the rules of product distribution and consumption patterns. Therefore, the social relations of production comprise the sum of the rights and authorities that individuals have on the basis of their form of participation in the productive process.<sup>14,29,30</sup>

Bourdieu<sup>3</sup> disagrees with the Weberian formulation by considering that status differences are manifestations of class positions and, from the structural standpoint, are not derived from these positions. He believes that the social world can be described as a space constructed by principles of differentiation and distribution in which agents are defined by their relative positions in that space.

The social field or space can be described as a multi-dimensional space of positions defined according to a set of coordinates. In the first dimension, the positions are defined by the volume of economic and cultural capital of the agents; in the second dimension, they are defined by the composition of capital (relative weight of each type of capital); in the third dimension, they are defined by the trajectories followed by the agents according to the stability or change in capital volume and composition that they experiment over time.<sup>25</sup>

Bourdieu postulated an intrinsic and necessary relationship between class location and habitus, which is a set of socially established provisions that the agents incorporate as a result of the experience of belonging to a certain class. The relationship between habitus and everyday practices configures lifestyles that, in turn, constitute social collectives or status groups differentiated by the symbolic boundaries between the different positions in the class structure occupied by the agents.<sup>25</sup> Based on the positions of agents in the social space, it is possible to delineate classes, i.e., sets of agents who occupy similar positions and who, when subjected to similar material limitations, must share similar interests, attitudes, and social practices.<sup>3</sup>

In health research, class position is a key element in determining access to social resources that are available for promotion, protection, and recovery of health. Class relations have direct and indirect consequences on health. Relations between classes and health outcomes are mediated by complex mechanisms of differential exposure to stressors, control and autonomy in labor processes, participation in wealth distribution, consumption patterns, behaviors, symbolic elaborations, and other social processes present in everyday life.<sup>23,24</sup>

In the public health literature, three main approaches to the social class concept have been observed: stratification according to economic or social variables, social class according to the Marxist approach, or social class according to the conception of Bourdieu.<sup>3</sup> In social epidemiology studies, the use of social stratification is more frequent, wherein the socioeconomic position is indicated by several variables without any explicit reference to the theoretical model or the sociological school of thought. Although less common, there are examples of relational approaches to class structures.<sup>13</sup>

## EXPLANATORY POTENTIAL OF THE SOCIAL CLASS CONCEPT

Although social stratification measures are very useful in describing and predicting the distribution of events and health problems, they have been less suitable to explain the social mechanisms that determine the position of social agents in the different gradients analyzed. Therefore, these measures have contributed little to the understanding of the social determinants of the health-disease processes.

The relational concepts of class, in any of their theoretical approaches, have greater explanatory potential. Studies show that stratification and class structure capture various aspects of social inequality in health and are not completely similar to each other.

Analyses based on social stratification are more consistent with the notion that health behaviors depend fundamentally on knowledge of the risks and benefits associated with particular courses of action. The explanations derived from relational approaches establish a connection between socioeconomic behaviors and circumstances, considering that behaviors of individual agents are determined by structural conditions. In the Weberian version, the explanatory emphasis is placed on the idea of different opportunities associated with different forms of agent participation in the market.<sup>10</sup>

In the Marxist version and in Bourdieu's perspective,<sup>3</sup> the material and symbolic conditions inherent to social relations and related to the agent's position in the social structure or social space are determinants of attitudes, preferences, resources, courses of action, and, consequently, health outcomes. Social classes exert pervasive psychological effects on their members, shaping the way individuals construct their social environment and behavior in relation to others.<sup>15</sup>

The notion of habitus is useful to overcome the macro-micro and objective-subjective dualities in the analysis of class and its impact on health because it mediates social structure (macrosocial organization) and the behavior of groups or individuals (micro-organization). On the other hand, by connecting the economic capital (material conditions) with the social and cultural capital, the subjective-objective duality in the analysis of social phenomena in everyday life is overcome.<sup>3</sup>

The explanatory capacity of class concepts in health research can be demonstrated by their interaction with predictors such as age, gender, and ethnicity, all of which are modified or subsumed by social class determinants.

Social classes explain how social inequalities are generated and are the basis for the distribution of social determinants of health, such as income, working

conditions, and access to health services. The relational concepts have a potentially greater explanatory power and higher theoretical density in health-related empirical analyses compared with conventional approaches focused on social stratification.<sup>12</sup>

Class analysis can be useful in explaining disparities in health status and epidemiological profile as well as in explaining distinct patterns of access and use of health services and resources in general.

## OPERATIONALIZATION MODELS OF SOCIAL CLASS

In addition to the two models embodied in the sociological literature and proposed by Goldthorpe<sup>7</sup> and Wright<sup>27</sup>, other models have been reviewed, such as the one proposed by Singer<sup>20</sup> and adapted by Barros<sup>1</sup> for health research and the one developed by Bronfman and Tuirán<sup>5</sup> and adapted by Lombardi et al.<sup>11</sup>

The model developed by Goldthorpe<sup>7</sup> is extensively used for the empirical analyses of social class, particularly in sociological research on social mobility. From the theoretical point of view, this model agrees with the Weberian conception of social class and seeks to establish the classification of individuals based on different characteristics of integration in the labor market. The scheme is constructed after considering, at a first level, the situation in the market, i.e., by grouping occupations that are similar in terms of employment conditions, source and level of income, financial security, and career prospects. A second level of differentiation takes into account the labor situation with regard to the position within the authority hierarchy and the level of control over the labor process. A third level of differentiation corresponds to employment, which considers the type of contract, number of employees, and other factors.<sup>4,7,17,18</sup> The resulting scheme defines three categories and seven classes (Table 1).

It is possible to adopt a summarized structure containing four classes: service class (I + II), intermediate classes (IIIa + V), manual workers (IIIb + VI + VII), and petite bourgeoisie (IV).

The Spanish Society of Epidemiology<sup>17</sup> has adapted this model for use in health research and proposed a scheme with five classes (Table 2).

Wright<sup>27</sup> started from Poulantzas's formulation,<sup>16</sup> which considers three determination axes for classes: economic, political, and ideological. The economic axis is defined by its polarity in the relation of exploitation and the distinction between productive and unproductive labor. In both the political and ideological axes, distinctions are made on the basis of the concepts of domination and subordination. A theoretical-methodological difficulty, i.e., the

**Table 1.** Goldthorpe class diagram<sup>7</sup> (2010).

Classes of service
I - Professionals with higher education, executives, and managers of large companies and major employers;
II - Professionals, managers, and administrators of small businesses or in positions of authority in a low hierarchy, such as supervisors of non-manual workers;
Middle Class
III - a) Workers in non-manual activities in administration or in commerce; b) non-manual workers in security activities or personal services;
IV - a) Small landowners and craftsmen with less than 25 employees; b) small owners and craftsmen without employees; c) farmers and self-employed extractivists;
V - Supervisors of manual workers;
Working Class:
VI - Skilled manual workers;
VII - a) Non-skilled manual workers in the secondary or tertiary sectors; b) non-skilled manual workers in the primary sector.

conceptualization and operationalization of productive and unproductive labor as well as the empirical observation that more than 85% of the economically active North American population had been categorized as proletariat, led Wright<sup>27</sup> to develop an alternative proposal within the framework of the Marxist theory of class analysis.

Wright<sup>27</sup> identified three distinct locations in the class structure, derived from exploitation relations in the capitalist production system: the bourgeoisie (investment controls, accumulation processes, means of production, and employed workforce), the proletariat (no control over the means of production), and the petite bourgeoisie (investment control over the means of production but no control over the workforce). He also proposed three other locations, which are considered contradictory, in order to solve the "middle class problem" in modern societies. He also claims the existence of contradictory locations

**Table 2.** Goldthorpe<sup>7</sup> (2010) diagram adapted by the Spanish Society of Epidemiology.

I - Executives in the public administration or in companies with 10 or more employees and professionals with academic credentials or postgraduate degrees;
II - Executives in companies with less than 10 employees, professionals with academic credentials, senior technicians, artists, and sportsmen;
III - a) Administrative staff, administrative or financial management support staff, and personal services or security workers; b) self-employed workers; c) supervisors;
IV - a) Skilled manual workers, b) semi-skilled manual workers;
V - Unskilled workers.

between the proletariat and the bourgeoisie (occupations with varying degrees of control over the means of production exercised by waged employees), between the proletariat and the petite bourgeoisie (semiautonomous employees), and between the petite bourgeoisie and the bourgeoisie (small employers).

Reviewing his proposition, Wright<sup>28,29</sup> reformulated his model and put greater emphasis on the concept of exploitation. In this perspective, the unequal distribution of the means of production constitutes the material basis for the exploitation system and capitalist accumulation. The social relations of production determine social class configurations, and fundamental disparity occurs between owners and non-owners of the means of production. Among the owners, he proposes stratification into bourgeoisie, small employers, and petite bourgeoisie according to the number of employees.

Non-owners of the means of production correspond to waged workers whose location can be created from two axes: domination/subordination relations in the production process and the possession of qualifications or expertise. Wright<sup>27,28</sup> considers that domination relations are also constitutive of the accumulation process because waged workers with domination positions act as delegates of capitalists and guarantors of the process of appropriation of the surplus value in addition to taking a portion of the surplus value through their wages. The possession of educational credentials or expertise distinguishes part of the waged workers because of their scarcity in the labor market. This is a mechanism that also allows these workers to be an appropriate part of the surplus value. Therefore, a scheme with 12 classes defined by the combination of the three axes would be possible (Table 3).

Santos<sup>18</sup> used this classification to define social classes in the Brazilian population using data from the National Research by Household Sampling (NRHS), and he showed the possibility of operationalization with Brazilian data.

In Brazil, two operationalization models have been used in health research. One was developed by Singer<sup>20</sup> to study the distribution of income in Brazil and adapted by Barros<sup>1</sup> for household health surveys, while the other was developed by Bronfman & Tuirán<sup>5</sup> for demographic

studies and was adapted by Lombardi et al<sup>11</sup> for use in epidemiological research.

Singer<sup>20</sup> formulated a class operationalization model from data available in the demographic census and the NRHS. He proposed a scheme of five classes defined on the basis of the occupied position, income level, activity sector, and occupation. Moreover, he considered the existence of two strata for the bourgeoisie: the entrepreneurial bourgeoisie, formed by legal owners of productive enterprises, and the managerial bourgeoisie, composed of executives and technicians in charge of corporate administration and administrators of the State apparatus (public administration, universities, foundations, research agencies, and others).

The petite bourgeoisie comprises the self-employed and small employers. The proletariat is a group of waged workers from all sectors of the economy, with the exception of those from the managerial bourgeoisie. Finally, individuals with precarious positions in the labor market, such as rural migrants, squatters, independent workers without a business, the unemployed, and the disabled, form the sub-proletariat. The operationalization strategy adopted by Barros<sup>1</sup> as an adaptation of the proposal by Singer is presented in Table 4.

Bronfman & Tuirán<sup>5</sup> developed an operationalization model for the *Encuesta Nacional Demográfica de Mexico* (National Demographic Survey of Mexico). The first dimension of the classification is the place or position in the production system (activity status, occupational position, sector and branch of activity, occupation, and number of employees). The second dimension is ownership of the means of production. The third dimension is the role in the social organization of labor (schooling and skills), and the fourth dimension is participation in wealth (salary and other income sources). From the combination of these dimensions, the authors arrive at a model of six classes: bourgeoisie, new petite bourgeoisie, traditional petite bourgeoisie, atypical proletariat, typical proletariat, and sub-proletariat<sup>5</sup> (Table 5).

Lombardi et al<sup>11</sup> compared the class structure of the population of Pelotas, RS, as classified according to the model of Bronfman & Tuirán<sup>5</sup> and as classified

**Table 3.** Diagram of 12 classes proposed by Wright<sup>27</sup> (1978).

Owners		Non-owners (workers)		
<i>Bourgeoisie</i>	Executives	Managers	Non-specialized managers	Control over the work process
Smallholders	Supervisors specialists	Supervisors	Non-specialized supervisors	Some control over the work process
<i>Petite bourgeoisie</i>	Experts	Skilled workers	Unskilled workers	Without control over the work process
Expertise and educational credentials				

**Table 4.** Strategy to operationalize the model of Singer<sup>19</sup> (1981) adopted by Barros<sup>1</sup> (1986).

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- a) Business *bourgeoisie* – including employers with five or more employees and an income equal to or greater than 9 minimum wages;
  - b) Managerial *bourgeoisie* – technical workers, professionals with higher education, and executives;
  - c) *Petite bourgeoisie* – employers with up to four employees, an income of less than 9 minimum wages, and an established independent business;
  - d) Proletariat – employees in the field of commerce, services, or industry except civil construction;
  - e) Subproletariat – workers in the agricultural sector, civil construction or domestic services, self-employed workers without a business, and those not included in the economically active population.
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according to that model used by Barros and observed that major discrepancies occurred in relation to: a) the reduction of the subproletariat as a result of the reclassification of agriculture and civil construction workers, skilled workers or administrative workers, as well as of the self-employed without a business but with specific skills; b) the increase of the proletariat as a result of the incorporation of the reclassified workers from the subproletariat; c) the reclassification of the managerial bourgeoisie as new petite bourgeoisie.

In general, these are the schemes that are currently available for the operationalization of class concept from a relational perspective. They are distinct from social stratifications based on the use of isolated socioeconomic variables or on the composition or synthesis of a set of socioeconomic variables.

#### LIMITATIONS AND SCOPES OF OPERATIONALIZATION MODELS

The operationalization process of any concept presents a number of conceptual, methodological, and technical challenges. In the case of a complex concept such as social class, these difficulties are even greater.

With regard to the conceptual dimension, the limitations noted by the authors or critics of these models are associated with three main problems: greater difficulty in operationalizing the political aspects of the concept rather than economic aspects, definition of the boundaries between the proletariat and the so-called “middle classes,” and difficulty in selecting empirical variables capable of describing the relational nature of certain processes to avoid reduction to mere stratification.<sup>22</sup>

With regard to the first problem stated above, there are critics who simply consider it impossible to operationalize social class concepts. They claim that it only makes sense as a theoretical tool in macrosocial analyses

developed by Marx and as an explanatory category in historical materialism. Others acknowledge operationalization, but they believe that only the economic aspects of translation into empirical approaches are amenable. Authors such as Wright<sup>27</sup> and Goldthorpe<sup>7</sup> are of the opinion that economic and political aspects are inseparable, and they believe in the possibility of translating any theoretical concept into a series of mechanisms, events, and empirical experiences susceptible of being observed in reality.<sup>22</sup>

With regard to class definitions, problems arise in the conceptualization of the proletariat, in the configuration of middle classes, and in the definition of strata within the bourgeoisie.<sup>22</sup> Poulantzas<sup>16</sup> proposed that only productive workers should be classified as workers. Goldthorpe<sup>7</sup> and Wright<sup>27,28</sup> classified waged workers who have no control over the labor process as proletariat, and found it difficult to empirically separate productive from unproductive labor. According to Wright<sup>28</sup>, authors' views on the boundaries of the middle class vary considerably and include the denial of their existence, the definition as a relation between two polar classes, conceptualization as new phenomena not previously theorized in the tradition of Marxist sociology or comprehensive sociology, and the concept of contradictory locations formulated by Marx to solve the problem.

The third problem within the conceptual domain refers to the translation of certain analysis categories into empirical variables. Concepts such as appropriation of

**Table 5.** Diagram of operationalization of Bronfman & Tuiran<sup>5</sup> (1984).

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- I – *Bourgeoisie* – Employers with five or more employees and income 15 minimum wages;
  - II – New *petit bourgeoisie* – employer with university training, with up to four employees and/or an income of <15 minimum wages; self-employed workers in the industrial sector, commerce field, or services, with university training; and workers with university training or in managerial positions in the industrial sector, commerce field, or services;
  - III – Traditional *petit bourgeoisie* – employer without university training, with up to four employees and/or an income of <15 minimum wages; self-employed worker without university training, business owner or skilled worker;
  - IV – Atypical proletariat – employee without university training and worker in managerial positions in the industrial sector, in activities not directly related to production, commerce field, and services;
  - V – Typical proletariat – self-employed worker in civil construction; skilled worker without university training and in a managerial position in the civil construction or other industrial areas;
  - VI – Subproletariat – self-employed worker or unskilled employee without university training and without a business.
-

surplus value, autonomy and control over production, and educational qualifications and credentials present challenges in the identification and articulation of empirical variables capable of translating them adequately.<sup>22</sup>

From a methodological point of view, the main problems encountered are as follows: classification of population segments that are not included in the production process, classification of individuals or family groups, and specificities of particular social formations.

Various authors recognize the need to adjust the models to the characteristics of each social formation and the goals of the empirical research. All models presuppose the possibility of grouping individuals in more or less classes, depending on the object of the research.<sup>7,22,29</sup>

Individuals not included directly in the production process, such as students and housewives, can be classified by their family relationships (class location mediated by family ties). Those individuals who are permanently excluded from the labor market can be grouped in the “oppressed” class, i.e., individuals excluded from the capitalist relations of production.<sup>7,27,30</sup> These solutions are not equally satisfactory and may pose new problems when applied empirically.

Other important methodological problems are associated with the class trajectory of individuals or simply their current situation, e.g., assigning the most adequate trajectory to an individual with different insertions in the production process, either choosing a family member who will determine the classification of the group or create a classification structure based on the different insertions of its members, and addressing the class situation of women.<sup>29</sup> These aspects depend on choices made by the researchers and will influence the final empirical results.

For statistical purposes, the operationalization models require large samples capable of providing a minimum number of individuals from all classes as well as databases with variables that are sufficient and appropriate to the construction of the proposed models.<sup>13,22</sup> This is one of the aspects that hinders the widespread use of these operationalization models.

It is necessary to establish relatively arbitrary cutoffs for some of the variables used, such as the number

of employees and income, even if fully convincing arguments for the values chosen are not available.<sup>17,20</sup>

The major problem may arise from the fact that social class is a distal determinant, the action of which is mediated by several more or less independent variables, and that its strength is relatively weakened after controlling these intervening variables in the regression models used in health research.<sup>13,17,22</sup> Although regression models are useful tools, they are rudimentary instruments while dealing with the complexity of social reality. In these models, social classes are included as another independent variable, and the relations of determination and mediation between the social class and the other intervening variables are not included in the model.

Despite all the limitations listed above, operationalization of the concept of social class has a greater explanatory power because stratified analyses are fragmented. The more widespread use of these models will allow assessment of the extent to which this theoretical expectation can be confirmed as well as the accumulation of experiences and practical solutions.

## FINAL CONSIDERATIONS

There are different theoretical perspectives and various operational models that can be used for the operationalization of social class concepts that can be used in empirical research.

From the theoretical point of view, all approaches are valuable for the study of social inequalities in health depending on the authors of the research. Therefore, none of the theories presented can be considered false, and all are useful to describe the phenomena; however, some theories have a greater explanatory power compared with others.

Conceptually, each of the models presented is consistent with the theoretical concept that underlies it, precluding the selection of one model over the others.

From an empirical point of view, it may be possible to differentiate the models at a later phase of the research, with the purpose of making empirical comparisons of the models presented.

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