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## Secular trends in social class differences of height, weight and BMI of boys from two schools in Lisbon, Portugal (1910–2000)

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## ABSTRACT

Data on the physical growth of children can provide useful information about the temporal changes in the economic conditions of the society in which they live and the extent of social inequalities within that society as well. Several studies have documented secular changes in the physical growth of children or of adult height, but seldom have the socioeconomic differences in secular trend been reported. The aim of this study is to examine differences in the secular trend of height, weight and BMI of 10–16-year-old boys enrolled in two schools of opposite socioeconomic makeup in Lisbon, Portugal, in the early and late 20th century. The samples from the upper-middle class come from the *Colégio Militar*, a military boarding school, and the lower-class samples come from the *Casa Pia de Lisboa*, a residential school for underprivileged boys. While boys from both schools show an approximate increase of 13.6 cm in height, 13.5 kg in weight and 2.4 kg/m<sup>2</sup> in BMI, the *Casa Pia* students were shorter and lighter than their *Colégio Militar* counterparts throughout the 90-year period. Social class differences in mean height, weight and BMI tend to be greater in 1910 than in 2000, but results are statistically significant for height alone. When the two periods are taken together, *Colégio Militar* boys differ from their *Casa Pia* counterparts by approximately 6.4 cm in height, 4.8 kg in weight and 0.4 kg/m<sup>2</sup> in BMI. Both samples show a considerable increase in height, weight and BMI but class differences in height, weight and BMI decreased slightly if at all, throughout the 90-year period. This suggests that socioeconomic disparities are persistent, having diminished only slightly since the early 20th century.

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### 1. Introduction

Although health status has been improving for most nations, vast socioeconomic inequalities persist both between and within countries. The elimination or reduction of health inequalities has become an urgent priority for public-health policy, and some governments and

international agencies have made the reduction of these inequalities their primary objective. There is evidence that in the more developed countries such inequalities are increasing, despite an improvement in the health status of the population as a whole. A recent cross-national comparison among European countries concludes that socioeconomic inequalities in health are widening (Menke et al., 2003). Portugal is one of the EU countries with the greatest socioeconomic disparities in health (Santana, 2002; Mackenbach et al., 2008).

These health inequalities are related to social and economic inequities within each nation and are embedded in its wider cultural and historical context. In Portugal,

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these inequalities are the product of a long political history. Portugal entered the 20th century as a declining world political power, with the efforts at industrialization occurring too late and too little, with a heavy primary sector based on a poor and rudimentary agriculture, and incapable of mastering market mechanisms. In 1910, Portugal was established as a republican state, and then in 1926, it gave rise to what turned out to be the longest-standing dictatorship Europe has known (Baião et al., 2003). It was not until 1974 that a military coup overthrew the dictatorship and set up the basis for a pluralist democratic system, which achieved major improvements in economic and social welfare. Therefore, during most of the 20th century, Portugal experienced only very slow changes, but in a few decades, particularly since the country's union with the EFTA (European Free Trade Association), in 1960, the country has accomplished what other nations have taken far longer to achieve. Portugal experienced a rapid growth and rapid change from a mostly agrarian society to one firmly oriented towards the service sector, but it was not until quite recently that the Portuguese have benefited from a very rapid increase in per capita GDP, reform of the educational system, increased accessibility to health services, improved social security, which covers almost the whole population, and better housing and working conditions. In 1986, Portugal became a member of the European Economic Community, an event that brought further progress, with the consolidation of social-organization models and major improvements in basic infrastructures. The military coup, in 1974, and entrance into the EU, in 1986, were responsible for a new stage of national modernization. These events were fuelled by a need to bring the Portuguese standards of living and development close to those of the rest of Western Europe and also aimed at a reduction of the gross inequalities and social injustices that had endured for centuries. However, Portugal remained one of the EU countries with the highest level of income inequality, and with the lowest rate of reduction in this inequality, during the last few decades (Cardoso, 1998; United Nations Development Programme, 2004; Domínguez-Domínguez and Núñez-Velázquez, 2005; Alvaredo, 2008; Lains et al., 2008).

Although Portugal witnessed dramatic improvements in living standards, has the country been able to reduce socioeconomic inequalities since the early 20th century? Is the country now more equal in terms of health conditions? Available data suggest that income inequality actually declined during the later dictatorship years (1960s–1970s), but then reversed course (Cardoso, 1998; Alvaredo, 2008; Lains et al., 2008). There is, however, no information on late-19th- or early-20th-century inequality. Thus, the anthropometric data collected for this study, on Portuguese boys from opposite ends of the class spectrum, provide a unique window on this extensive and important period. The use of anthropometric data to analyse the effects of socioeconomic change in health within, and between, societies is based on the assumption that human growth is responsive to changes in the environment. In other words, this kind of study relies on the notion that a child's growth rate reflects his/hers state of health and nutrition, amount of energy expenditure, and overall

sanitary conditions (Tanner, 1982; Susanne, 1984; Fogel, 1986; Schell, 1989; Bogin, 1999). Thus, data on the physical growth of children can provide useful information not only about the extent of social inequalities within a society as a whole but also about changes over time in the economic conditions of its various sub-groups (Bielicki, 1998).

The historic data used in this study refer to the heights and weights of boys from two schools in Lisbon during the early 20th century. Students from the *Colégio Militar*, a military boarding school, make up the middle-to-upper-class sample, and students from the *Casa Pia de Lisboa*, a residential school for underprivileged boys, comprise the lower-class sample. These data were compared with the heights and weights of boys from the same schools in the late 20th century, in order to infer changes in socioeconomic inequalities over time. Although the growth of children in these samples may not necessarily represent the growth of Portuguese children near the extremes of the socioeconomic spectrum, a comparison of these two groups should provide important insights into the social dynamics of the 20th century in Portugal.

## 2. Material and methods

### 2.1. Background of samples

Founded in 1803, the *Colégio Militar* is a military boarding school whose prime purpose has been to provide education to the sons of military officers. It is a preparatory, secondary, military and residential school for boys and young men between the ages of 10 and 17. The mission of the *Colégio Militar* is to develop the 'whole man' in that he is not only prepared academically, but also physically and morally, to lead a life of service and excellence in the military (Matos, 2003). Development of physical fitness, academic grades and moral character are important goals for each cadet. In contrast, *Casa Pia* is a public institution, founded in 1780, to provide shelter, food, assistance and education to orphaned, poor and homeless boys of the Lisbon area (*Casa Pia de Lisboa*, 1904). This residential institution is committed to giving these boys, who have been denied a normal family life, not only an equal education in a special setting, but also a good understanding of their social condition, and to do so totally separate from the family (Camilo, 1984).

In the early 20th century, the *Casa Pia* admitted only abandoned boys, orphaned boys, and boys who had lost one parent and whose surviving parent could not support the family. Illegitimate sons were accepted only in cases of extreme poverty. At present, the admissions policy is not so restrictive, but the institution's mission remains to provide for the most underprivileged families and children. In the early 20th century, *Casa Pia* boys were almost exclusively from working-class and poor single-parent families. In contrast, the admissions policy of the *Colégio Militar* was to give priority to sons of military officers, particularly sons of those who had been killed or incapacitated in combat. Cadets are also selected on the basis of a series of academic and health examinations. Although sons of civilians have also been allowed to attend, their admission has been very limited and is

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