



# Overweight trends among Polish schoolchildren before and after the transition from communism to capitalism



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## ABSTRACT

This study aims to reveal the secular trends in body mass index (BMI) and the prevalence of overweight and obesity among Polish schoolchildren between the years 1966–2012, during which intense socio-political changes took place. Four surveys were conducted in several districts of Poland looking at 69,746 schoolchildren aged 7–18. Significant increase in mean BMI as well as in the prevalence of overweight and obesity was observed. During this time the highest increase in both mean BMI and excess weight was observed between 1988 and 2012, i.e. after the political transformation, resulting in the improvement of living conditions. However, with respect to girls in late adolescence, between these years, the mean BMI as well as the prevalence of overweight were leveling off, while the percentage of boys with excess body fat in the same developmental category significantly increased in 2012. In the years 1966–1978 and 1978–1988 the pattern of changes in the prevalence of overweight and obesity reflected the social and economic circumstances, i.e. temporary economic improvements, or deepening political crises and food shortage. In conclusion, the weight status of schoolchildren strongly reflects socio-political changes that took place in Poland, as well as in most of the Central European countries in the last half century.

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## 1. Introduction

Secular trend in body size is a biological result of changes in environmental conditions. During the last 150 years, among the human population, the progress of civilization, related to the technological development within the areas rising the quality of life (e.g. advanced health-care and food technology) has significantly influenced the rate and direction of secular changes (Cole, 2003; Eveleth, 2001). One particular example in which this phenomenon may be observed is body mass index (BMI). Although it does not measure adiposity directly (compare: e.g. Burkhauser and

Cawley, 2008; Ellis et al., 1999), the standardized classification of overweight and obesity, based on this index, is commonly recommended and widely used for a worldwide comparison of its rising prevalence rate (James, 2004). A constantly increasing prevalence of excess body fat has become a serious problem in both Western and Westernizing countries. Economic growth, related to intensified industrialization and market globalization, by its association with a higher standard of living and greater availability of food, has influenced the dietary and lifestyle trends in both developed and developing parts of the world. Studies on adults have revealed a global tendency toward a significant increase in overweight and obesity since 1960s (Freedman et al., 2010; see also Stevens et al., 2012). A secular trend in higher levels of BMI and a vast prevalence of obesity have been observed especially in the USA

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(Komlos and Baur, 2004; Komlos and Brabec, 2010, 2011; Ogden et al., 2014) and Europe (e.g. Gutiérrez-Fisac et al., 2012; Lahti-Koski et al., 2010; Midthjell et al., 2013; Zaninotto et al., 2009; but compare: van Jaarsveld and Gulliford, 2015, where stabilization in the childhood overweight and obesity rates were observed between 2004 and 2013). However, recent research has shown that the secular increase in BMI over a relatively short period of time is observed also in adult citizens of developing countries, such as China (Jin et al., 2013), Mexico (Ferrer et al., 2013) or India (Chopra et al., 2013). Moreover, this problem also refers to children and adolescents in many countries, where secular trends in overweight and obesity have significantly accelerated between the 1980s and late 1990s (Freedman et al., 2010). This phenomenon has been observed particularly among schoolchildren in the USA (e.g. Fels Longitudinal Study, Sun et al., 2012), many European countries (e.g. de Castro et al., 1998; Decelis et al., 2013; Lissner et al., 2013; Parrino et al., 2012; Stamatakis et al., 2010; Vignerová et al., 2007; Zellner et al., 2007), but also in different parts of the world, such as India (Chhatwal et al., 2004; Gupta et al., 2011) and China (Ji et al., 2013; Ying-Xiu and Shu-Rong, 2012; Yu et al., 2012).

In Poland (Central Europe) the obesity rate has been relatively low in the past, however its prevalence has increased from the 1960s through to the 1980s (Rogucka and Bielicki, 1999). One of the most specific features of the communism in Poland was incessant economic crises that threaten economic development. Usually they took place in the middle of the Five-Year Plans (periodic plans of economic improvement). Despite the accelerated economic development strategy, implemented in 1959, and increase of capital expenditures by 80%, national official statistics reported a decline in GDP. At the end of the 1960s and the beginning of the 1970s the deterioration in living conditions was observed. These issues have led to the outbreak of the economic and political crisis in 1970 and the violent suppression of the workers' protests by the police and the army. As a consequence of these events, the leadership in government has been changed as well as a new strategy for economic growth has been established. The government abstained from the increment in prices for food products and increased the minimum salary and, as a result, GDP has grown by 10% in the first half of the 1970s. Consequently, improvement of living conditions has affected the change in consumption patterns. However, in the mid-1970s economic collapse occurred. After 1978 there was a decrease in real income in approximately 50% of the households, while the foreign trade deficit caused a further increase in debt of the country. That caused long-term economic crisis, which has led to the political and social crisis in the mid-1980s. Since the debt was not paid the country's financial liabilities were constantly increasing. First, the inflation, and then – hyperinflation appeared. Moreover, inadequately prepared necessary reforms have not produced the expected effects. The sustained growth of GDP did not come until the political transformation from a centrally planned to a free market economy, which began in 1989. The rapid changes that took place after this event, have contributed to a major

shift toward a Western lifestyle, dietary habits (changes in diversity, quality and availability of food, resulting in its increased intake) and leisure-time activities (an increased popularity of television and computer games, especially among children, resulting in a decrease of active leisure).

Moreover, the proportion of overweight young male adults gradually increased according to nationwide research in all socio-economic groups between 1965 and 2010 (Kołodziej et al., 2015; Koziel et al., 2004; Koziel et al., 2006; Lipowicz et al., 2014) as well as in the south-eastern Poland between 2000 and 2010 (Binkowska-Bury et al., 2013). Regarding Polish children and adolescents, the prevalence of obesity among boys from Wrocław (South-West Poland) was higher in 1997 by more than one percent in comparison with the 1987 sample, whereas overweight was slightly lower in the 1997 sample (Koziel et al., 2000). Referring to young inhabitants of Kraków (South-Central Poland), the rate of overweight and obesity doubled within 30 years (1971–2000) in both sexes, however, there was no positive secular trend in BMI among adolescent girls (Chrzanowska et al., 2007). Based on the above results, estimations of obesity prevalence in various parts of Poland seem to be regionally dependent (Milewicz et al., 2005). Nevertheless, there is a lack of cross-sectional results concerning the secular trend in BMI as well as the prevalence of excess weight in children and adolescents in Poland during last few decades.

Moreover, it is particularly interesting to investigate this issue not only with respect to overall trend in BMI throughout this period, but also within the context of gradual socioeconomic changes, which may be reflected in subtle variations in fatness in subsequent years, depending on the political circumstances. Such linkage between political as well as economic changes and adiposity was found, for instance, in Cuba: at first, adiposity was affected by economic blockade followed by food shortage and increased physical activity caused by fuel shortage, and after economic recovery by improvement in food availability and transportation as well as by rising popularity of computer games, related to rise in nutritional intake and decline in physical activity (Esquivel and González, 2010). Accordingly, this paper aims to describe trends in the weight status of the Polish population of children and adolescents during the last nearly 50 years. These changes in weight (BMI and both overweight and obesity) may reflect social, economic and political transformation, as the sample includes individuals born just after World War II, during long-lasting period of socialism and communism, as well as those who were born after the economic transition from a centrally planned to free-market economy.

## 2. Materials and methods

### 2.1. Survey methods and participants

From 1966 to 1988 three cross-sectional anthropometric surveys were conducted in Poland. Parts of these surveys were previously analyzed and described in other publications (Bielecki et al., 2012; Bielicki and Welon, 1982; Hulanicka and Waliszko, 1991; Lipowicz, 1999). However, analyses concerning these studies in the context

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