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INCOME INEQUALITY AND OBESITY PREVALENCE AMONG OECD COUNTRIES

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Summary. Using recent pooled data from the World Health Organization Global Infobase and the World Factbook compiled by the Central Intelligence Agency of the United States, this study assesses the relation between income inequality and obesity prevalence among 31 OECD countries through a series of bivariate and multivariate linear regressions. The United States and Mexico well lead OECD countries in both obesity prevalence and income inequality. A sensitivity analysis suggests that the inclusion or exclusion of these two extreme cases can fundamentally change the findings. When the two countries are included, the results reveal a positive correlation between income inequality and obesity prevalence. This correlation is more salient among females than among males. Income inequality alone is associated with 16% and 35% of the variations in male and female obesity rates, respectively, across OECD countries in 2010. Higher levels of income inequality in the 2005–2010 period were associated with a more rapid increase in obesity prevalence from 2002 to 2010. These associations, however, virtually disappear when the US and Mexico have been excluded from the analysis. Findings from this study underscore the importance of assessing the impact of extreme cases on the relation between income inequality and health outcomes. The potential pathways from income inequality to the alarmingly high rates of obesity in the cases of the US and Mexico warrant further research.

Introduction

Previous studies have documented an ecological association between income distribution and population health and mortality (e.g. Wilkinson, 1992; Kaplan *et al.*, 1996; Kawachi *et al.*, 1997; Lynch & Kaplan, 1997; Kahn *et al.*, 2000; Rodgers, 2002; Subramanian *et al.*, 2003). Based on a review of 168 analyses on this topic, Wilkinson & Pickett (2006) found that a large majority (78%) of these studies were wholly or partially supportive of the observation that, after adjusting for differences in *per capita* income across countries or regions within the same country, health was worse in countries or regions where income differences were larger. Given that most of these studies used mortality (e.g. life expectancy, infant mortality or adult mortality) as an indicator of population health, relatively little is known about the relation between income

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distribution and the prevalence of specific health conditions such as obesity, malnutrition or particular diseases. An important limitation associated with the use of overall mortality indicators such as life expectancy is that it can mask differences in causes-of-death structure between countries or regions and how income distribution has contributed to these differences (Lynch *et al.*, 2001). Understanding the linkages between income distribution and specific health conditions thus becomes important to unravel the much debated relationship between income distribution and health (Marmot & Wilkinson, 2001; Chang & Christakis, 2005).

Extant literature has suggested several potential pathways through which income inequality can be related to negative health outcomes (e.g. Kawachi *et al.*, 1997; Lynch & Kaplan, 1997; Marmot, 2002; Subramanian & Kawachi, 2004). One of the most fundamental pathways concerns the so-called 'concavity-induced income inequality effect' (Subramanian & Kawachi, 2004). It rests on the premise that the relation between individual income and health status is concave, such that each additional dollar of income improves individual health by a decreasing amount. This also means that the health impact of one additional dollar of income should be more important for the poor than for the rich. Correspondingly, a transfer of income from the rich to the poor should help improve the average health status of the whole society as long as the transfer does not go too far to deter investments, innovations and economic growth.

Subramanian and Kawachi further differentiate this concavity-induced effect of income inequality from the independent, contextual effect of income inequality. The latter is based on the observation that societies or regions with a higher level income inequality are usually associated with under-investment in human resources such as education and medical care (Kaplan *et al.*, 1996; Smith, 1996; Lynch & Kaplan, 1997), as well as a lack of social capital and trust (Kawachi *et al.*, 1997), all of which can have a profound impact on the average health status of the societies or regions. Despite these findings, the published evidence so far is by no means conclusive about the relation between income distribution and population health (Subramanian & Kawachi, 2004). While some studies reported evidence supporting the negative association between income inequality and population health, others questioned these findings (e.g. Wagstaff & van Doorslaer, 2000; Beckfield, 2004).

This study seeks to assess the relation between income distribution and obesity prevalence among OECD countries. Obesity rate has been increasing rapidly in all OECD countries, yet it is not clear if this increase and its differential paces across OECD countries have anything to do with differences in income distribution across these countries. Using recent country-specific aggregate data, this study examined the association between income inequality and obesity prevalence among OECD countries with and without adjusting for differences in socioeconomic development across these countries. Meanwhile, the study also assessed whether, and the extent to which, changes in obesity prevalence over time was related to income distribution among OECD countries.

Methods

Data

Data used in this study come from two sources: the World Health Organization (WHO) and the World Factbook released by the US Central Intelligence Agency

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(CIA). The WHO Global Infobase is a data warehouse that collects, stores and displays information on chronic diseases and their risk factors for all WHO member states. It provides estimates of obesity rates by country for the years 2002, 2005 and 2010. This has made it possible to calculate changes in obesity rates among OECD countries between 2002 and 2010 by subtracting obesity rates in 2002 from those in 2010.

The data on obesity prevalence were then merged with the CIA World Factbook data, which contain information on *per capita* income, income distribution, urbanization, literacy level and a whole range of economic indicators for all OECD countries. Among the 34 OECD countries, 31 have estimates of Gini coefficients in or after 2005, whereas three countries – Japan, New Zealand and Chile – do not have updated Gini estimates after 2005. Since the WHO obesity prevalence estimates were for 2010, this study restricted analysis to the 31 OECD countries that had Gini coefficient estimates in or after 2005 in an effort to synchronize data from the two sources. It should be noted that both the number of OECD countries and the CIA World Factbook has been changing over time and the data are periodically updated. An exception is that the Gini index is not updated each year. The data collection for this study was completed at the end of 2010 based on available information from the CIA World Factbook and WHO Global Infobase websites.

Measures

Obesity prevalence is defined as the percentage of the population aged between 15 and 100 that have a body mass index (BMI) of 30 or greater. Based on reported statistics and survey data from its member countries, WHO Global Infobase conducted a series of adjustments to make sure that the finally estimated prevalence rates of obesity of each country are comparable to each other. These changes include adjustments for definitions, adjustments to a standard set of age groups, adjustments of non-representative data to the national population, and adjustments to a standard reporting year using available trend information (WHO, 2010). Moreover, to ensure data quality, data entry was done through a quality assurance framework such that information or data was double-checked throughout all domains (source, survey and data). The WHO Global Infobase also provides information on obesity prevalence by gender, which allows us to assess if the relation between income inequality and obesity differs across gender groups, as suggested by previous studies (Zhang & Wang, 2004; McLaren, 2007; Due *et al.*, 2009).

The key explanatory variable used in the analysis of obesity prevalence is the Gini index, a commonly used indicator of income distribution. The index measures the degree of inequality in the distribution of family income in a country. It is calculated from the Lorenz curve, in which cumulative family income is plotted against the number of families arranged from the poorest to the richest. The index is the ratio of (a) the area between a country's Lorenz curve and the 45 degree helping line to (b) the entire triangular area under the 45 degree line. The Gini index ranges from 0 to 100, with 0 denoting no income equality at all and 100 denoting perfect income inequality (CIA, 2010).

Extant literature on obesity suggests several relevant factors that guided the selection of the control variables used in this study. Previous studies have documented a negative association between education and obesity (e.g. Monteiro *et al.*, 2001; Kennen

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et al., 2005; Drewnowski & Darmon, 2005). It has also been revealed that urbanization is linked to obesity rates. People living in more urbanized areas tend to walk less and have jobs that require less physical effort than those living in rural areas (e.g. Philipson & Posner, 1999; Finkelstein *et al.*, 2004; Goel, 2006). Several studies have reported a negative association between scoioeconomic status (SES) and obesity (e.g. Zhang & Wang 2004; Drewnowski & Darmon, 2005; Stunkard, 2007). A common explanation for this association is that individuals with low SES might have restricted access to sports facilities and might opt for low-cost, processed food. McLaren (2007) surveys the literature on SES and obesity and finds that the association between the two variables varies by level of country development and gender. Moreover, Zhang & Wang (2004) suggest that the negative association between SES and obesity is stronger for women and the association differs across ethnic groups as well.

In this study, GDP *per capita* was calculated based on purchasing power parity. Literacy was measured as the percentage of the population that could read and write. Urbanization rate is the percentage of the population that lives in urban areas. Poverty level is measured in relative terms: it denotes the percentage share of household income or consumption of the lowest 10% of households in the income distribution of a country. This measure is important in its own right because it provides information on the relative deprivation of those who are at the bottom of the income spectrum, which goes beyond what can be captured by the Gini index.

Analysis

A series of graphs were plotted to show the bivariate relationships between the Gini index and obesity prevalence by gender, and R^2 statistics based on OLS regressions were also presented in the graphs. Using similar analyses, this study also related changes in obesity prevalence over time to the Gini index among the 31 OECD countries in the sample.

The core of the study concerns the relation between the Gini index and obesity rates by gender. Multivariate linear regressions were used to assess this relation net of the effects of selected covariates such as GDP *per capita*, the urbanization rate and literacy and poverty levels. A comparison of results from these multivariate analyses and those from bivariate analyses can help reveal the robustness of the relation between the Gini index and obesity prevalence. As a further step to test the robustness of the relation, multivariate regression models were replicated with and without incorporating countries that have extreme values in Gini index and obesity prevalence. Similar multivariate OLS regressions were also conducted to assess the association between income inequality in 2010 and changes in obesity prevalence from 2002 to 2010 among the OECD countries in the sample.

Results

Description of the OECD countries in the sample

Table 1 provides a description of the variables used in the study. It indicates a substantial variation in terms of obesity prevalence and its changes over time among OECD countries. The average prevalence rate of male obesity is 17%, ranging from

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Table 1. A description of the variables used, OECD countries, 2010

Variable	Mean	Min.	Max.	SD	*n*
Male obesity rate (%)	17.68	8.30	44.20	7.90	31
Female obesity rate (%)	20.52	7.60	48.30	9.40	31
% changes in male obesity rate: 2002 to 2010	3.14	0.00	12.20	2.63	31
% changes in female obesity rate: 2002 to 2010	3.08	0.00	10.50	2.50	31
Gini index in the 2005–2010 period	31.73	23.00	48.20	5.79	31
GDP *per capita* (thousands of US$)	33.45	11.20	78.00	13.10	31
Ln GDP *per capita*	10.34	9.32	11.26	0.40	31
% that can read and write	98.11	87.40	100.00	2.76	31
Urbanization rate	74.74	48.00	97.00	11.93	31
Share of household income by lowest 10%	3.05	1.70	7.50	1.09	30[a]

Sources: World Health Organization Global Infobase and CIA World Factbook.
[a] Among the 31 OECD countries in the sample, information on the share of household income by the lowest ten is missing for Iceland.

8.3% (South Korea) to 44.2% (United States) with a standard deviation of 7.9%. The corresponding range for female obesity rate is from 7.6% (France) to 48.3% (United States) with a mean of 20.5% and a standard deviation of 9.4%. Thus, the US has the highest obesity prevalence among OECD countries.

In terms of changes in obesity prevalence from 2002 to 2010, on average OECD countries in the sample experienced an increase of 3.1% in both male and female obesity rates. The ranges of increases are from 0 (Poland and Hungary) to 12.2% (United States) for male obesity and from 0 (Poland and Hungary) to 10.5% (United States) for female obesity. Other OECD countries experienced an increase in obesity prevalence in between.

The OECD countries in the sample also differ considerably in terms of income distribution and socioeconomic development. The average Gini index in the 2005–2010 period is 31.7. It ranges from 23.0 (Sweden) to 48.2 (Mexico), with a standard deviation of 5.8. The mean GDP *per capita* is US$33,450 with a standard deviation of US$13,100. The average literacy rate is 98% and the average rate of urbanization is 75%. In terms of the percentage share of household income or consumption of those in the lowest 10% in the national household income distribution, the average is 3.1% across OECD countries in the sample, ranging from 1.7% in Mexico to 7.5% in Switzerland.

Bivariate analysis

An examination of the bivariate relation between income inequality and male obesity rates, as indicated in Fig. 1a, reveals a weak, positive correlation between the two variables. The R^2 is 0.16, suggesting that the Gini index helps explain 16% of the variation in male obesity rates across OECD countries. In general, countries with higher Gini indexes tend to have higher prevalence of male obesity. This is especially the case for the US and Mexico, the two countries that lead the OECD countries in terms of both Gini indexes and male obesity prevalence. For the rest of the sample, the association

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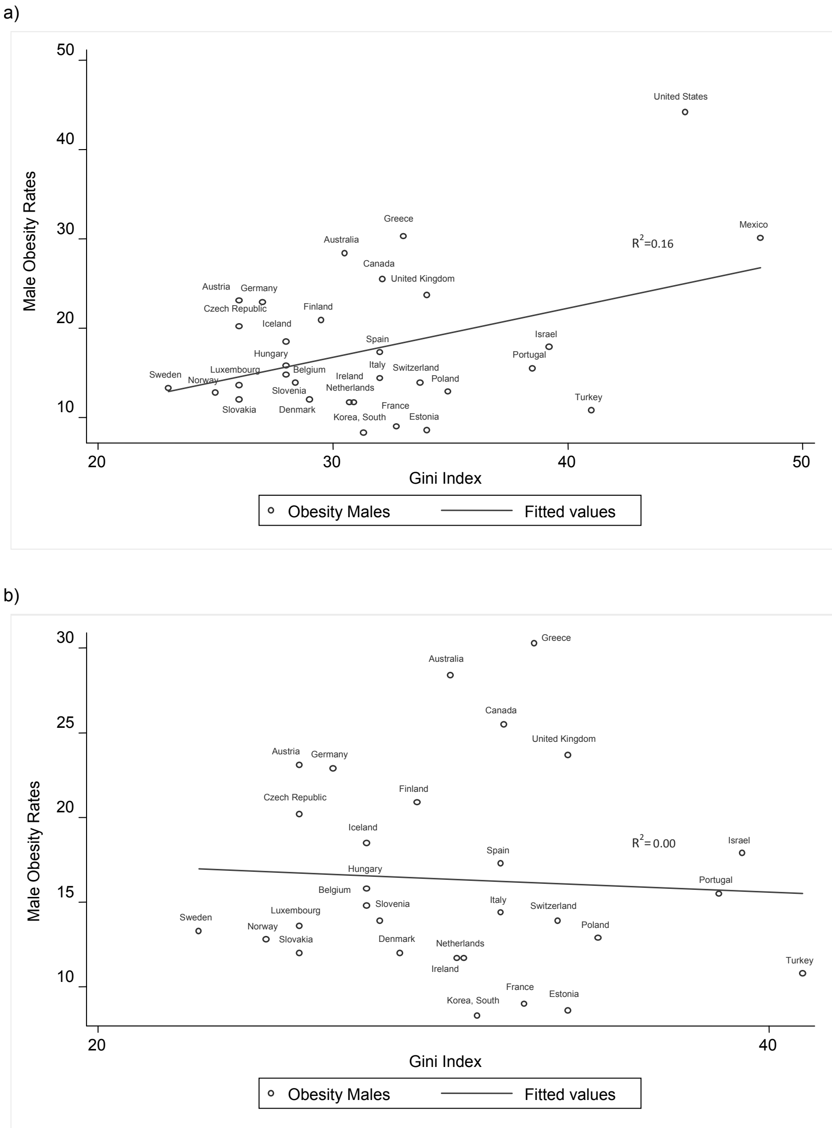

Fig. 1. Gini indexes and male obesity rates in OECD countries in 2010 (a) including and (b) excluding the US and Mexico. Sources: World Health Organization Global Infobase and CIA World Factbook.

between income inequality and male obesity rates becomes less obvious. Figure 1b shows that once the US and Mexico have been excluded from the analysis, there is no association at all between income inequality and male obesity rates.

The positive correlation between income inequality and obesity prevalence becomes more salient when it comes to female obesity rates, as indicated in Fig. 2a. Again, the

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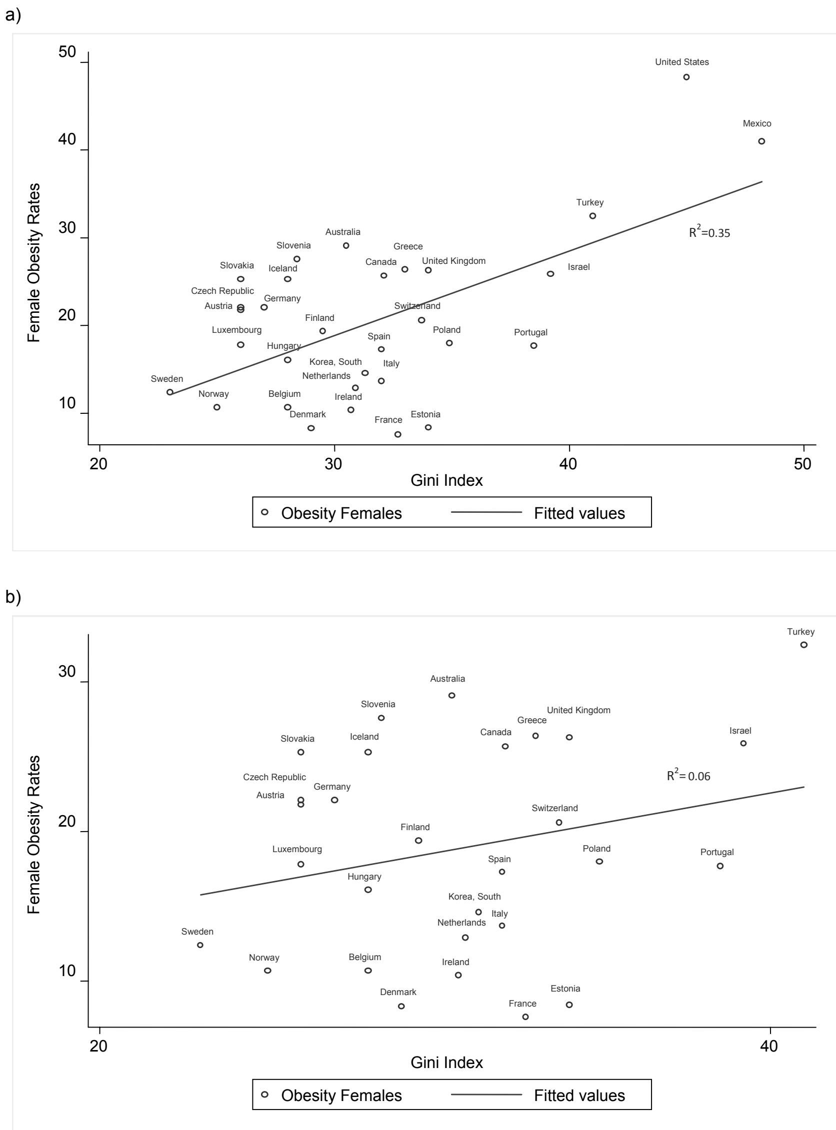

Fig. 2. Gini indexes and female obesity rates in OECD countries in 2010 (a) including and (b) excluding the US and Mexico. Sources: World Health Organization Global Infobase and CIA World Factbook.

US and Mexico are on the top in terms of both the Gini index and the obesity rate. About 35% of the variation in female obesity rates across the OECD countries can be explained by differences in the Gini index across these countries. However, this observed association between the Gini index and female obesity prevalence virtually disappears when the US and Mexico have been excluded from the analysis (Fig. 2b).

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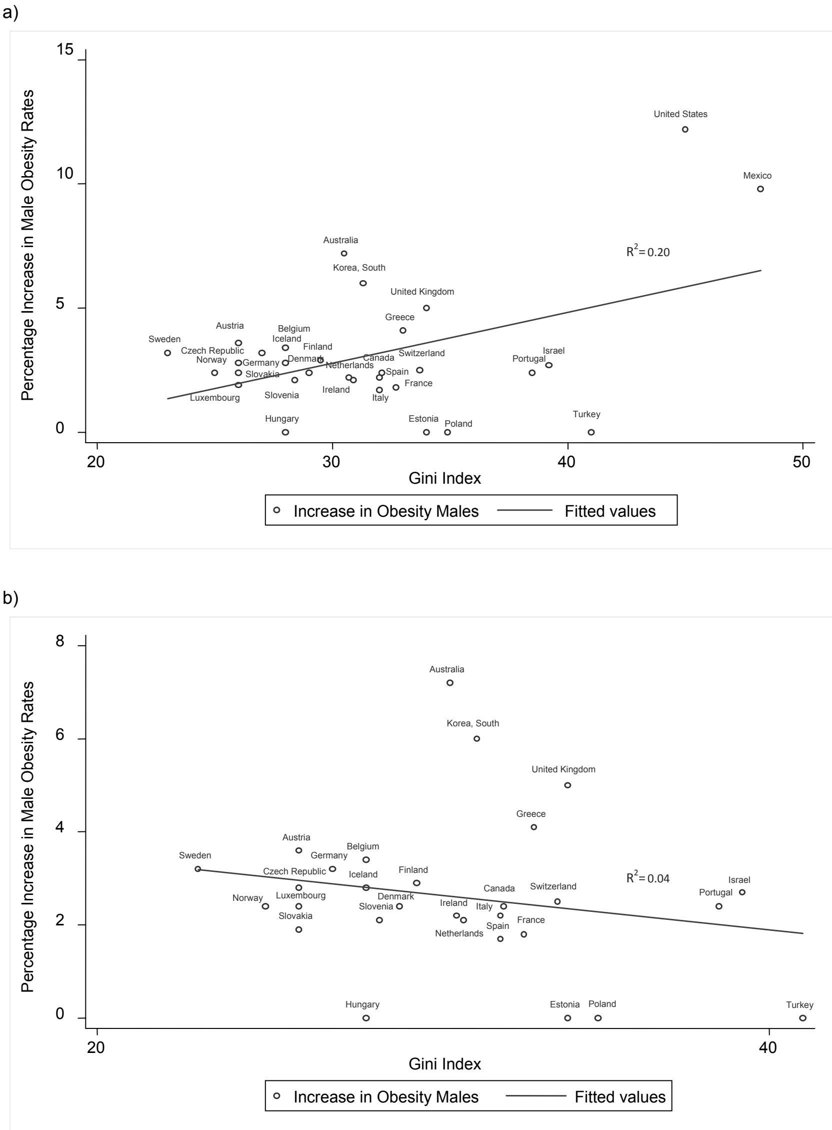

Fig. 3. Current Gini indexes and increases in male obesity rates from 2002 to 2010 in OECD countries (a) including and (b) excluding the US and Mexico. Sources: World Health Organization Global Infobase and CIA World Factbook.

In terms of the relation between the Gini index in the 2005–2010 period and changes in obesity prevalence from 2002 to 2010, higher Gini indexes are in general associated with more substantial increases in male obesity rates ($R^2 = 0.2$), as indicated in Fig. 3a. Among all OECD the countries in the sample, the US and Mexico experienced the most increase in male obesity rates from 2002 to 2010, followed by Australia, South

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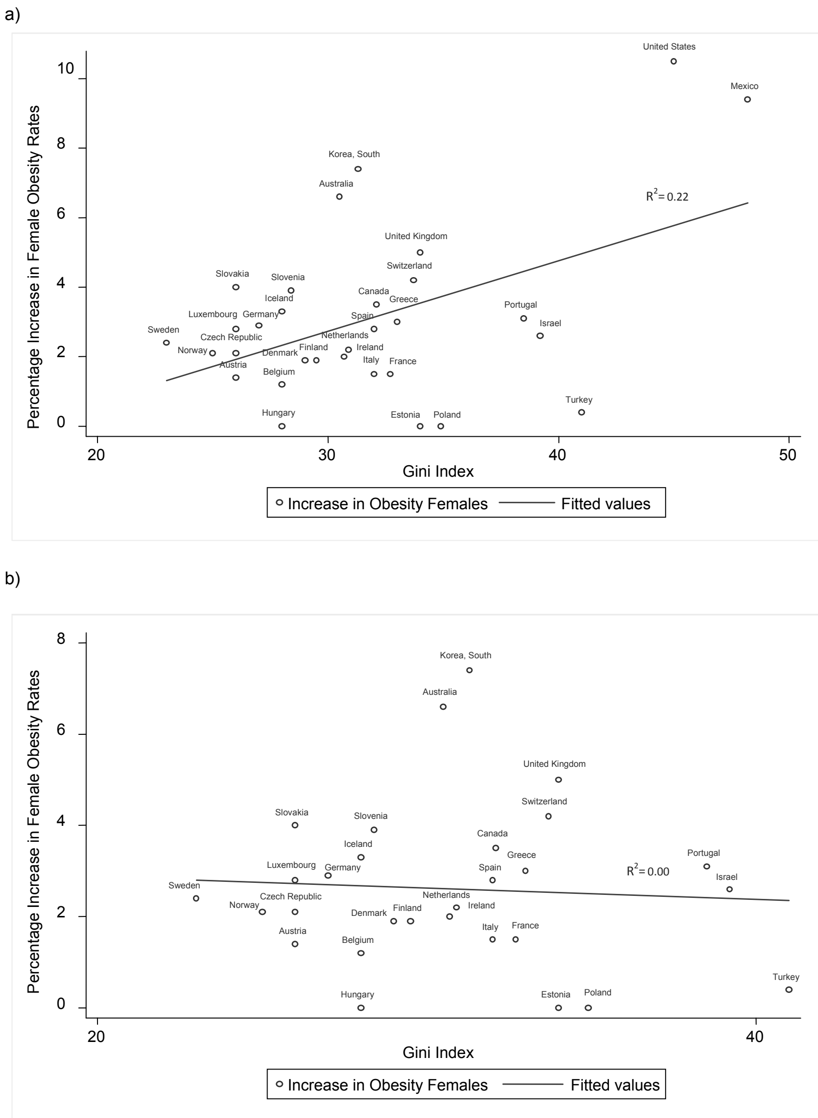

Fig. 4. Current Gini indexes and increases in female obesity rates from 2002 to 2010 in OECD Countries (a) including and (b) excluding the US and Mexico. Sources: World Health Organization Global Infobase and CIA World Factbook.

Korea and the United Kingdom. This positive correlation between the current Gini index and increases in male obesity rates over time does not hold any more when the US and Mexico have been excluded from the analysis (Fig. 3b). Similar findings can also be extended to female obesity rates where the US and Mexico have contributed the most to the observed correlation between the current Gini index and changes in female obesity prevalence over time among OECD countries (Fig. 4a, b).

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Table 2. Linear regressions of obesity rates by gender

	a) With US & Mexico		b) Without US & Mexico	
Regression model	Males	Females	Males	Females
Gini index in the 2005–2010 period	0.82* (0.32)	1.00** (0.35)	0.01 (0.38)	0.07 (0.43)
Ln GDP *per capita*	8.36 (4.72)	4.48 (5.27)	4.94 (4.41)	0.16 (4.89)
% that can read and write	0.22 (0.72)	−0.43 (0.80)	−0.25 (0.66)	−1.03 (0.74)
Urbanization rate	−0.04 (0.13)	−0.10 (0.15)	−0.02 (0.12)	−0.08 (0.13)
Share of household income by lowest 10%	−1.07 (1.42)	−0.27 (1.58)	−0.70 (1.25)	0.19 (1.38)
Number of countries	30	30	28	28
R^2	0.32	0.40	0.07	0.18

Sources: World Health Organization Global Infobase and CIA World Factbook.
* $p < 0.05$; ** $p < 0.01$.
Standard errors are included in parentheses.

Multivariate analysis

Results based on multivariate linear regression, as summarized in Table 2, reveal a significant association between the Gini index and obesity prevalence for both males and females. After adjusting for the effects of GDP *per capita*, literacy, urbanization and the percentage share of household income by the poorest 10% households, on average each unit of increase in the Gini index corresponds to an increase of 0.82 percentage points in male obesity rates ($p < 0.05$). The corresponding effect becomes one percentage point in the case of female obesity rates ($p < 0.01$). Thus, consistent with findings from the bivariate analysis, higher income inequality is associated with a higher level of obesity prevalence. In particular, this association is stronger in the case of female obesity prevalence. It should also be noted that, among all the covariates in the base models, the Gini index turns out to be the only variable that shows a significant association with obesity prevalence. However, panel b of Table 2 shows that the significant association between obesity and Gini index disappears when the US and Mexico have been excluded from the analysis.

Current income inequality also shows a significant association with changes in obesity prevalence over time. As indicated by the results in Table 3, a higher degree of income inequality is associated with more rapid increases in both male and female obesity rates from 2002 to 2010. After adjusting for the effects of other covariates in the models, each unit of increase in the Gini index corresponds to a 0.28 percentage point increase in the male obesity rate and a 0.29 percentage point increase in the female obesity rate ($p < 0.01$ in both cases). Again, these effects are only significant when both the US and Mexico have been included in the analysis. Panel b of Table 3 illustrates a drop in

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Table 3. Linear regressions of changes in obesity rates from 2002 to 2010 by gender

	a) With US & Mexico		b) Without US & Mexico	
Regression model	Males	Females	Males	Females
Gini index in the 2005–2010 period	0.28** (0.10)	0.29** (0.10)	−0.04 (0.09)	0.05 (0.11)
Ln GDP *per capita*	2.80 (1.43)	2.33 (1.43)	1.81 (1.05)	1.72 (1.28)
% that can read and write	0.04 (0.22)	0.07 (0.22)	−0.09 (0.16)	−0.01 (0.19)
Urbanization rate	0.03 (0.04)	0.01 (0.04)	0.03 (0.03)	0.01 (0.03)
Share of household income by lowest 10%	−0.32 (0.43)	−0.14 (0.43)	−0.20 (0.30)	−0.07 (0.36)
Number of countries	30	30	28	28
R^2	0.44	0.37	0.31	0.12

Sources: World Health Organization Global Infobase and CIA World Factbook.
** $p < 0.01$.
Standard errors are included in parentheses.

the association between increases in estimated rates of obesity and Gini index when the US and Mexico are not included.

Limitations of the study

Due to data constraints, several limitations of this study are noteworthy. The study was based on recent data on OECD countries that are available on the WHO and CIA websites. Details on data collection and measures can only be provided to the extent whereby related information has been publicized on the two websites, which makes it difficult to evaluate the quality as well as the representativeness of the data collected from each of the OECD countries in the sample. In particular, the WHO Global Infobase utilizes country-reported data from a variety of sources including national and regional surveys, as well as estimates from published studies. In some countries where there are few data, surveys may be non-representative of the national population (Strong & Bonita, 2003).

It should also be noted that while obesity prevalence was based on the 2010 WHO estimates, information on the Gini index was collected by the CIA between 2005 and 2010. Since the Gini index could change from 2005 to 2010, this issue of synchronization could potentially influence the accuracy of the estimates. Another limitation of the study is that the cross-sectional nature of the data makes it difficult to infer causality between income inequality and obesity, as well as to figure out the mechanisms through which income inequality could be related to obesity. Despite these limitations, this study utilizes most recent information from the WHO and CIA to assess the association between income inequality and obesity prevalence with and without adjusting

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for differences in socioeconomic development across OECD countries. The findings, as discussed below, highlight the exception of the US and Mexico in obesity prevalence as well as the importance of evaluating the impact of extreme cases or outliers when it comes to assessing the relation between income inequality and health outcomes using aggregated country-level data.

Discussion

Globally, obesity has increasingly become a public health concern. This concern arises out of two observations. One is that obesity has proven to be a non-trivial risk factor for hypertension, type-2 diabetes, cardiovascular diseases, gall-bladder disease and some cancers (Pickett *et al.*, 2005). For instance, it has been estimated that roughly 60% of all cases of diabetes can be directly attributed to weight gain (Yach *et al.*, 2006). Analyses of mortality disparities also show that, relative to normal weight, obesity is associated with an elevated risk of mortality (e.g. Flegal *et al.*, 2005; Adams *et al.*, 2006; Corrada *et al.*, 2006). The other observation is that the prevalence of obesity increased worldwide to unprecedented levels in the twentieth century. In the US the age-adjusted average BMI among adult white males increased from 22.8 in the late 19th century to 28.0 in the year of 2000. The corresponding increase in the age-adjusted rate of obesity was even more dramatic, from 2.5 to 28.2% (Su, 2005).

Despite this general trend in obesity prevalence, results from this study reveal substantial variations in estimated obesity prevalence across OECD countries in 2010. Moreover, these countries also differ considerably from each other when it comes to changes in obesity prevalence in the period from 2002 to 2010. Of particular importance are the US and Mexico, the two countries that truly stand out and lead the OECD countries in terms of both current obesity rates as well as the pace of increases in obesity prevalence over time.

One of the major findings of this study is that, when both the US and Mexico have been included in the analysis, differences in obesity prevalence and its changes over time across OECD countries are more related to differences in income inequality than to differences in absolute income across these countries. The lack of salience of GDP *per capita* in explaining obesity prevalence tends to suggest that absolute income is no longer a powerful predictor of obesity prevalence across OECD countries. Presumably, GDP *per capita* might be more relevant in predicting obesity prevalence in less developed countries where many people are still suffering from starvation, malnutrition and excessive use of manual labour. In these countries GDP *per capita* should be more correlated with net calorie intake than in OECD countries. After GDP *per capita* increases to a certain level whereby most people in the population have enough to eat, its importance in explaining differences in obesity prevalence across countries gradually dwindles. A similar lack of explanatory power of GDP *per capita* has also been observed when it comes to disparities in life expectancy across OECD countries (Marmot & Wilkinson, 2001).

The aforementioned associations between income inequality and obesity prevalence virtually disappear when the US and Mexico, the two extreme cases in both Gini index and obesity, have been excluded from the analysis. This suggests that the revealed association between income inequality and obesity prevalence in both the bivariate

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and multivariate analyses is essentially driven by the high levels of income inequality and obesity in the US and Mexico. The association is rather weak among the rest of the OECD countries in the sample. These findings underscore the importance of assessing the impact of extreme cases on the relation between income inequality and health outcomes when country-level data have been used for international comparisons, a topic that has received little attention in the literature so far.

Results from this study also point to the urgency of understanding the mechanisms that could potentially link income inequality to obesity in the cases of the US and Mexico. A review of the literature on income inequality and health suggests several pathways by which income inequality and obesity can be associated with each other. In their review article, Subramanian & Kawachi (2004) conceptualized three pathways linking income inequality to health. Each of these three pathways can shed light on the association between income inequality and obesity prevalence, as discussed below.

The first is a 'structural pathway' which points to a causal effect of income inequality on residential segregation and spatial concentrations of poverty in economically disadvantaged communities. Residents from these deprived communities face elevated risks of obesity due to a whole host of factors such as inadequate supply of affordable nutritional food (Lopez, 2007), poor street or pavement conditions that discourage walking, higher crime rates that deter outdoor activities and lack of adequate facilities to exercise (Gordon-Larsen *et al.*, 2006). Using data collected by the Wise-Woman programme of the Centers for Disease Control and Prevention, Mobley *et al.* (2006) examined the relation between characteristics of the built environment and risks for obesity and cardiovascular disease. Their findings suggest that holding other factors constant, an additional fitness facility per 1000 residents was on average associated with a reduction of 1.39 BMI units. Local crime rates were also found to be positively associated with BMI risk. As American society becomes more unequal and segregated, these negative conditions in disadvantaged communities are expected to continue to be important risk factors for obesity and other chronic conditions.

The second pathway is what Subramanian and Kawachi termed 'social cohesion' or 'social capital'. This pathway has been based on the observation that higher levels of income inequality are associated with disinvestment in social capital, which in turn can contribute to a series of negative health outcomes as indicated by total mortality as well as rates of deaths from coronary health disease, cancer and infant mortality (Kawachi *et al.*, 1997). In their study social capital has been defined as, 'features of social organization such as civic participation, norms of reciprocity, and trust in others that facilitate cooperation for mutual benefit,' (p. 1491).

The 'social capital' pathway has rich implications for the association between income inequality and obesity. According to this pathway, when societies become more unequal and polarized, mistrust and lack of reciprocity will become more commonplace. This in turn will create more psychological stress at the individual level, which can contribute to an increase in behaviours that are detrimental to health such as smoking, alcohol abuse and the use of illicit drugs. In this sense, the 'social capital' pathway can be viewed as a component of the psychosocial pathway that has been documented in the literature (e.g. Lynch & Kaplan, 1997; Marmot & Wilkinson, 2001; Marmot, 2004; Wilkinson, 2005). Presumably, an individual who has experienced emotional or psychological stress will become less attentive to issues related to diet, exercise and weight gain.

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The third pathway mentioned by Subramanian and Kawachi is the 'policy pathway', whereby the adverse influence of income inequality on health may operate through the formulation and implementation of general social policies as well as through health-related policies. Usually, the more polarized a society is, the more difficult it will be to implement policy initiatives that can effectively address health or health care challenges faced by the segment of the population that is economically disadvantaged. Excessive levels of income inequality are related to under-investment in human resources such as education, health care and other social infrastructure (Smith, 1996; Lynch & Kaplan, 1997). In the US, states with higher levels of income inequality are also those that invest less in education and medical care (Kaplan *et al.*, 1996). Among the major developed countries, the US is the only country that does not provide universal health insurance coverage for its citizens. It is also the country with the highest level of income inequality. Are these two related to each other? If so, how are they related? Answers to these questions should also help elucidate why the US currently has the highest rates of obesity as well as the most rapid increase in obesity prevalence among OECD countries.

An important policy implication of findings from this study is that income inequality and redistributive policies that would help alleviate income inequality should be adequately considered when it comes to coping with the ongoing obesity epidemic in the US and Mexico. After all, obesity is not simply caused by having a high-calorie diet, a sedentary lifestyle or a combination of both. Underlying these symptoms or behaviours is usually something more fundamental – whether it be anxieties, psychological distresses, limited health literacy or lack of self-esteem or efficacy – which is intrinsically linked to individual-level socioeconomic status. These fundamental issues are presumably more important for countries with a high level of income inequality such as the US and Mexico, which so far have made little progress in reducing obesity prevalence within their borders.

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