Burden of Obesity: 10-Year Review of the Literature on Obesity Prevalence in Nine Countries

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Introduction

Obesity is a major public health issue in most developed countries and a growing problem in less developed countries that are becoming more affluent.[1] Increases in the prevalence of obesity have been observed throughout the world. Because obesity raises the risk of type 2 diabetes, hypertension, hyperlipidemia, heart disease, stroke, certain cancers, arthritis, and other conditions, reduction in obesity is an important public health goal. This literature review summarizes epidemiological data from nine countries: Australia, Canada, France, Germany, Italy, Spain, Sweden, the United Kingdom (UK), and the Unites States (US).

Methods

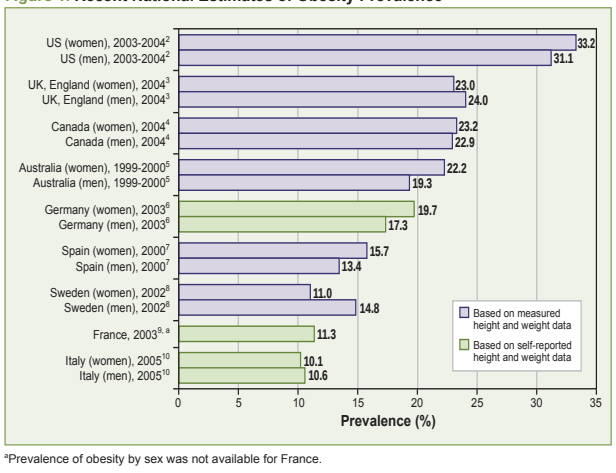
We searched articles with abstracts indexed in MEDLINE and published in English, French, German, Italian, Spanish, or Swedish between 1997 and June 2007 to identify data on the prevalence of obesity. The Medical Subject Heading (MeSH) terms "obesity" and "obesity, morbid" were combined with those for "epidemiology," "prevalence," and "pharmacoepidemiology" to search all articles published between 2004 and 2007. For articles published between 1997 and 2003, the same MeSH terms were used, but the search was limited to review articles. From the MEDLINE searches, 365 abstracts were identified, and 59 were selected for full-text review. EMBASE, International Pharmaceutical Abstracts (IPA), and Current Contents Connect (CCC) databases also were searched with similar keywords and limits; 250 additional abstracts were identified, and 14 were chosen for full-text review. Other resources were identified through Internet searches; these resources include the World Health Organization (WHO), ISPOR conference proceedings, and federal government Web sites offering population-level epidemiology data.

Results

Current Prevalence Rates

The most widely accepted definition of obesity is a body mass index (BMI) of 30 kg/m^2 or more. Unless otherwise noted, BMI ≥ 30 kg/m^2 is the case definition used in prevalence studies. The US has the highest prevalence of obesity among the countries reviewed (Figure 1). Australia, Canada, Germany, and the UK also have relatively high obesity prevalence. France, Italy, Spain, and Sweden have comparatively low obesity prevalence.

Figure 1. Recent National Estimates of Obesity Prevalence



[a]Prevalence of obesity by sex was not available for France.

Obesity Prevalence Trends

Obesity prevalence has increased significantly during the past two to three decades for most of the countries reviewed; prevalence in Italy, however, does not appear to have increased dramatically (Table 1).

Table 1. Trends in Prevalence of Obesity Among Countries Reviewed

Country	Type of Data	Earlier Estimate (%)	Year of Earlier Estimate	Later Estimate (%)	Year of Later Estimate
Australia[5]	Measured	7.1	1980	20.8	2000
Canada[4]	Measured	13.8	1978-1979	23.1	2004
France[9, 11]	Self-reported	6.1	1980	11.3	2003
Germany[12, 13]	Self-reported	11.5	1999	18.1	2002-2003
Italy[10, 14]	Self-reported	7.4	1983	9.9	2005
Spain[15, 16]	Self-reported	7.8	1987	13.3	2003
Sweden, men[8]	Measured	6.4	1985	14.8	2002
Sweden, women[8]	Measured	7.2	1985	11.0	2002
UK[17]	Self-reported	12.0	1991	18.4	2002
US[1, 2]	Measured	15.0	1976-1980	32.9	2003-2004

Data Collection Method Significance

Table 2 presents a comparison of selected national and large regional (e.g., WHO-Multinational MONItoring of trends and determinants in CArdiovascular disease [MONICA] Project) obesity prevalence estimates identified in this literature review. These estimates are based on self-reported and measured height and weight data, and comparisons are taken from studies based on comparable populations, or studies in which estimates based on both types of data were reported simultaneously. Estimates based on measured data are substantially higher than those based on self-reported data.

Table 2. Comparison of Obesity Prevalence Rates Based on Selected Measured and Self-Reported Height and Weight Data

Country	Self-Reported Data Source, Year Collected	Prevalence, Self-Reported Data	Prevalence, Measured Data	Measured Data Source, Year Collected	Percentage Difference
Australia	Australian National Health Survey, 1995[18]	Men: 11.2% Women: 11.3%	Men: 17.9% Women: 16.7%	Same as self-reported[18]	Men: 59.8% Women: 47.7%
Canada	CCHS, 2003[19]	15.2%	Men: 22.9% Women: 23.2%	CCHS, 2004[4]	Men: 50.7% Women: 52.6
France	INSEE, 2002-2003[20]	9.7%	13.7%	Same as self-reported[20]	41.2%
France	IEFS, 1997[21]	7.0%	Men: 13.0% Women: 11.0%	WHO-MONICA, 1995-1997[22]	Men: 85.7% Women: 57.1%
Germany	Microcensus–Health Questions, 2005[12]	13.6%	Men: 24.0% Women: 23.0%	WHO-MONICA, 1994-1995[23]	Men: 76.4% Women: 69.1%
US	BRFSS, 2005[24]	23.9%	32.2%	NHANES, 2003-2004[2]	34.7%

BRFSS = Behavioral Risk Factor Surveillance System; CCHS = Canadian Community Health Survey; IEFS = Institute of European Food Studies; NHANES = National Health and Nutrition Examination Survey; INSEE = National Institute for Statistics and Economics Studies.

References

Please refer to poster handout.

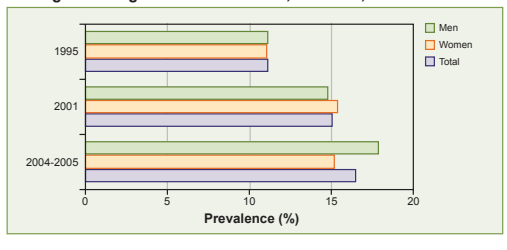
Country-specific Trend Data

Australia

The prevalence of obesity in Australia is relatively high compared with other developed countries, although not as high as the rate in the US. Between 1980 and 2000, the prevalence of obesity based on measured data increased 2.5-fold.[5]

The most recent measured BMI data were collected in 1999-2000. The overall prevalence estimate in this study (20.8%) was higher than that found in a more recent study using self-reported data (16.8%; 2004-2005 data). The self-reported data were from the National Health Survey of Australia. Figure 2 shows increases in obesity prevalence based on the 2004-2005 self-reported data and previous years of the survey (1995 and 2001).[18]

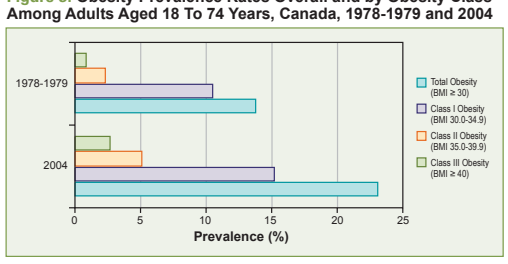
Figure 2. Age-Standardized Prevalence (%) of Obesity (BMI ≥ 30) Among Adults Aged 18 Years or Older, Australia, 1995 to 2004-2005



Canada

Nationally representative survey data from the 1978-1979 Canada Health Survey were age-standardized to the 2004 Canadian Community Health Survey. Both surveys used measured data. Comparison shows a substantial increase in obesity with the greatest increases in class II and class III obesity (Figure 3).[4]

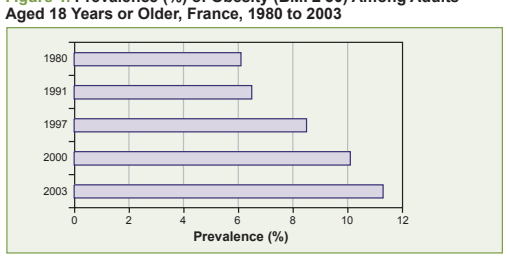
Figure 3. Obesity Prevalence Rates Overall and by Obesity Class Among Adults Aged 18 To 74 Years, Canada, 1978-1979 and 2004



France

Charles and colleagues[11] have reported trends in prevalence of self-reported obesity from 1980 through 2000 using INSEE and ObEpi data. We have added recent estimates from the ObEpi 2003 study.[9] Figure 4 shows the increase in the prevalence of obesity from 1980 through 2003. The only prevalence trends based on measured data are from the 1985-1987 and 1995-1997 waves of WHO-MONICA, which showed a significant increase for men ($P < 0.05$) but not for women.[22]

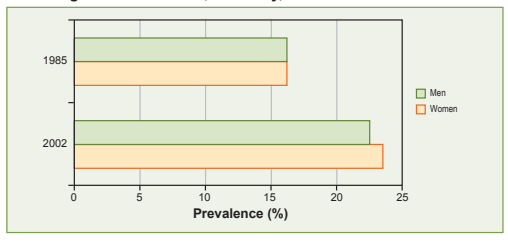
Figure 4. Prevalence (%) of Obesity (BMI ≥ 30) Among Adults Aged 18 Years or Older, France, 1980 to 2003



Germany

Based on an analysis of four national health surveys and three surveys from the Bertelsmann Health Monitor of approximately 26,500 individuals aged 25 to 69 years, the prevalence of moderate obesity (BMI of 30-34.9) increased from 16.2% in men and 16.2% in women in 1985 to 22.5% and 23.5%, respectively, in 2002. During this period, the prevalence of extreme obesity (BMI of 35 or more) increased from 1.5% to 5.2% in men and 4.5% to 7.5% in women. In these surveys, obesity was based on self-reported height and weight.[25]

Figure 5. Prevalence of Moderate Obesity (BMI 30-34.9) Among Adults Aged 25 to 69 Years, Germany, 1985 and 2002



Italy

Compared with other European countries, Italy has a lower prevalence of obesity (Figure 1). Time trends during the last 20 years[14] do not reflect the dramatic increases in prevalence observed in other developed countries. However, regional differences are sizable, with higher obesity prevalence in the southern part of the country.[26]

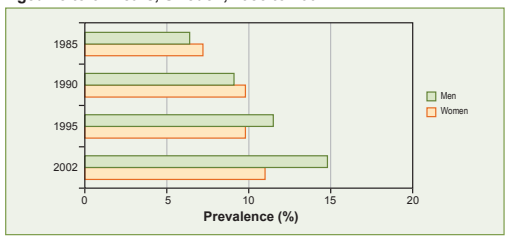
Spain

From 1987 to 2003, the prevalence of obesity increased from 7.8% to 13.3% in different waves of the National Health Survey.[15, 16] The most recent prevalence estimates using measured height and weight are based on data collected in 2000.[7]

Sweden

The prevalence of obesity in Sweden is low compared with other countries.[27] During the past two decades, the overall prevalence of obesity has increased approximately two-fold (Figure 6).[28, 29] The increasing trend in obesity has been observed in population-based studies using both clinical and self-reported measures.

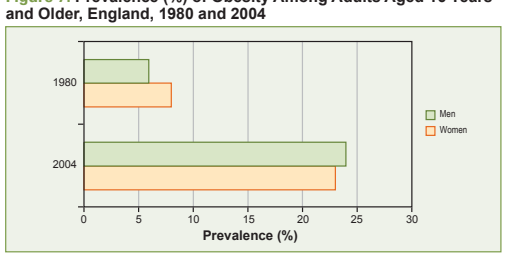
Figure 6. Prevalence (%) of Obesity (BMI ≥ 30) Among Adults Aged 25 to 64 Years, Sweden, 1985 to 2002



UK

Based on measured height and weight, prevalence rates of obesity from the Health Survey for England tripled during the last 20 years (Figure 7). In the last 10 years, the increases in obesity prevalence were most notable among younger persons; the prevalence doubled among persons aged 25 to 34 years.[30]

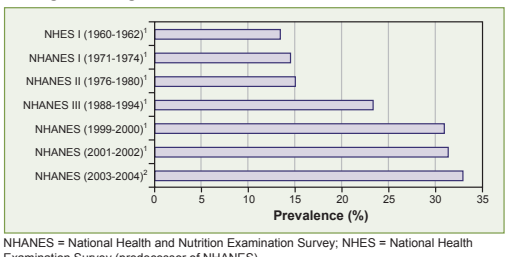
Figure 7. Prevalence (%) of Obesity Among Adults Aged 16 Years and Older, England, 1980 and 2004



US

Figure 8 presents the overall age-standardized prevalence of obesity among US adults aged 20 to 74 years based on National Health and Nutrition Examination Survey (NHANES) data from 1960 through 2003-2004. Data are presented only for persons less than age 75 years, as earlier waves did not include persons aged 75 years and older. The age-adjusted prevalence of obesity increased from 13.4% to 32.9% over this period.[1, 2] A sharp increase in obesity prevalence occurred after 1980.[1]

Figure 8. Overall Age-Adjusted Prevalence of Obesity (BMI ≥ 30) Among Adults Aged 20 to 74 Years, US, 1960 to 2004



NHANES = National Health and Nutrition Examination Survey; NHES = National Health Examination Survey (predecessor of NHANES).

Limitations

This review includes only country-specific epidemiologic information published in the literature and indexed in MEDLINE, IPA, or CCC, or available on the Internet. Native speakers conducted searches of studies or data published in French, German, Italian, Spanish, and Swedish; these non-English language searches were not exhaustive but did represent information from key disease and regulatory authorities.

Conclusion

Among the epidemiological research, recent national estimates based on measured, rather than self-reported, data are needed in several of the countries reviewed. For most of the countries reviewed, no national estimates of the prevalence of measured obesity have been reported in the last 5 years. An analysis of prevalence research summarized in this report indicates that studies based on measured weight and height provide estimates that are substantially higher than comparable studies based on self-reported weight and height.

Although a great deal of information has been published on the rising prevalence of obesity in many countries, knowledge gaps remain. Given the significant public health impact of obesity, having a thorough understanding of the prevalence of obesity is an important goal for national governments. This understanding should be founded on measured height and weight data and should include regional analyses where necessary.

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