Journal of Business and Economics, ISSN 2155-7950, USA
January 2020, Volume 11, No. 1, pp. 1-9
DOI: 10.15341/jbe(2155-7950)/01.11.2020/001

http://www.academicstar.us

Obesity: A Rising Economic Concern

Elsy Thomas Kizhakethalackal
(Firelands College, Bowling Green State University, USA)

Abstract: Obesity can no longer be contained as a health issue but is an economic phenomenon that can no longer be ignored. The increasing prevalence of obesity indicates an important public health crisis. According to the most recent Behavioral Risk Factor Surveillance System (BRFSS) data, adult obesity rates now exceed 35% in 7 states, up from 5 states in 2016 and 25% in 48 states. Besides excess health expenditure, obesity also imposes an economic cost, costs in the form of lost productivity and foregone economic growth. Therefore, addressing the obesity epidemic remains crucial for ensuring the health of the nation. My paper throws light on this issue.

Key words: obesity; economic cost; health and inequality

JEL codes: I20, I140

1. Introduction

According to the Center for Disease Control and Prevention weight that is higher than what is considered as a healthy weight for a given height is described as overweight or obese. Body Mass Index (BMI), is used as a screening tool for overweight or obesity. A higher BMI is an indicator of high body fat. Having a BMI value less than 18.5 is considered as underweight, between 18.5 to < 25 is considered as normal, between 25 to < 30 is considered overweight range and 30 or higher is obese, CDC (2019). For women whose body fat exceeds 30% and men whose body fat exceeds 25% are generally considered obese. Other measures of obesity include waist circumference (WC) and waist to hip circumference ratio (WHR). These two measures are often used to measure abdominal obesity and its association with various metabolic risk factors appear more useful that the use of BMI alone. Of all high-income countries, the United States has the highest rates of overweight and obesity, with fully a third of the population obese-a rate projected to rise to around 50 percent by 2030 (Wang et al., 2011).

2. Literature Survey on the Economics of Obesity

Obesity is not just a health concern but an economic phenomenon. The 1980s technological advancement has resulted in a shift away from manual employment. This gradual decline in manual labor, though not intended to be attributed to a rise in obesity, has led to a more sedentary jobs Philipson (2001), Lakdawalla and Philipson (2002). It has also expanded to our households. The proportion of homes with washing machines, dishwashers and household appliances have risen considerably. As per the US Census Bureau report the sales have gone up from $8.44 billion in 1992 to $12.08 billion in 2000 to $17.12 billion in 2015, U.S Census Bureau (2019). Environmental factors include marketing, advertising, increasing portion sizes, accessibility and availability of calorie dense foods

Elsy Thomas Kizhakethalackal, Ph.D. in Applied Economics, Associate Professor of Economics, Firelands College, Bowling Green State University; research areas/interests: applied economics, health, development. E-mail: ekizhak@bgsu.edu.

and increased automation, all of which have contributed to increased energy intake and reduced energy expenditure (Poveda A. et al., 2016).

Research to date has identified at least four major categories of economic impact linked with the obesity epidemic: direct medical costs, productivity costs, transportation costs, and human capital costs (Hammond R. & Levine R., 2010). Several studies offer retrospective or prospective estimates of the degree of disease incidence that can be linked to obesity, and of the magnitude of associated direct medical costs. Thompson et al. (1999) present a dynamic model of the relationships between BMI and the risks of five diseases linked with obesity: hypertension, hypercholesterolemia, type 2 diabetes mellitus, coronary heart disease (CHD), and stroke. Results indicate substantial increase in disease risk with increasing BMI. Analysis of NHANES-II cross-sectional data for both men and women found risk of hypertension and diabetes to be increased 3.0 times and 2.9 times, respectively, compared to the non-overweight (Gorsky et al., 1996; Itallie, 1985).

Obesity has substantially increased in recent decades and is now one of the major global health problems. The large obesity-related health burden negatively impacts many relevant health outcomes (e.g., quality of life, disability, mortality) and leads to increased healthcare utilization. This excess service use is the main driver behind high healthcare costs of obese individuals. Findings indicate that costs rise curvilinearly with increasing body mass index, especially among the obese. As more individuals of a country's population become obese, a larger share of total annual national healthcare expenditure is spent on obesity and obesity-related health problems. In addition to escalating healthcare costs, obesity goes along with indirect costs through decreases in workforce productivity. The empirical evidence has shown beyond doubt that obesity negatively impacts individuals, healthcare systems, employers, and the economy as a whole (Lehnert et al., 2013).

The economic costs of obesity are tremendous. The National Institutes of Health have estimated the total cost of overweight and obesity to the U.S. economy in 1995 dollars at $99.2 billion, approximately $51.6 billion in direct health care costs and $47.6 billion in indirect costs. Data from the National Health Interview Surveys suggest that nationally 39.3 million workdays are lost annually to obesity-related causes. In 2008, the medical cost related to obesity were estimated to be $147 billion (Cawley et al., 2012). According to the State of Obesity 2017 report, the annual cost of health care related to obesity in U.S. is $150 billion. $8 billion is the cost related for state Medicaid programs for severe obesity. $1 billion accounts for the annual cost of healthcare and lost productivity among obese members and their family and $6.3 billion in indirect cost associated with absenteeism attributed to obesity.

Productivity loss related to obesity can be measured in various ways. The literature includes analyses of the aggregate productivity loss due to obesity, as well as estimates for various sub-categories of productivity costs. Productivity loss resulting from absenteeism often considered as first-order and presenteeism — decrease in productivity while at work. Premature mortality and loss of Quality Adjusted Life Years (QALYs), higher rates of disability benefit payments an welfare loss in the health insurance market also help capture obesity related productivity losses (Hammond et al., 2010; Burton et al., 1998; Frone, 2008; Ricci & Chee, 2005; Pronk et al., 1999, Burkhauser & Cawley, 2004; Cawley, 2010; Groessel et al., 2004; Bhattacharya & Sood, 2006; Thompson et al., 1998; Lightwood et al., 2009; Tsai et al., 2008; Serxner et al., 2001; Howarth et al., 2018).

Increases in body weight results in more fuel usage increase and potentially, larger vehicles. The impact of obesity on greenhouse gas emissions mainly occurs through three channels: higher fuel consumption needed to transport heavier people, greater food production needed to feed a population with higher caloric intake, and higher methane emissions resulting from the greater organic waste generated by a heavier population. greenhouse gas emissions (Dannenberg et al., 2004; Jacobson & King, 2009; Jacobson & McLay, 2006; Michaelowa & Dransfield,

2008; Finkelstein et al., 2005; Finkelstein et al., 2010).

With the increasing rates of childhood and adolescent obesity another potential impact of obesity and overweight on the quality and quantity of educational attainment represents another potential economic impact. Gortmaker et al. (1993), Kaestner et al. (2009), Geier et al. (2007), Sabia (2007), all provided statistical evidence of a potential link between obesity and the educational experience of students.

3. Recent Statistics and Obesity Trends

According to recent statistics released by the CDC (2019):

- All states had more than 20% of adults with obesity, 25% to < 30% of adults had obesity in 19 states
- 30 to <35% of adults had obesity in 22 states, Guam and Puerto Rico
- 35% or more adults had obesity in 7 states – Alabama, Arkansas, Iowa, Louisiana, Mississippi, Oklahoma, and West Virginia
- The South (32.4%) and the Midwest (32.3%) had the highest prevalence of obesity, followed by the Northeast (27.7%) and the West (26.1%)
- Obesity rates are higher among Latinos (47 percent) and blacks (46.8 percent) than among whites (37.9 percent).
- Women are more likely to have obesity than men, 41.1 percent versus 37.9 percent. Women are also more likely to have severe obesity, 9.7 percent versus 5.6 percent.
- Adults in rural areas are more likely to have obesity than those in metro areas, 34.2 percent versus 28.7 percent.
- College graduates are less likely to be obese than those with less than a high school education, 22.2 percent versus 35.5 percent.
- Adults with higher incomes are less likely to be obese. The obesity rate is 29.7 percent among those making 400 percent or more above the federal poverty line; the rate is 42.6 percent for those at 100 to 199 percent of the federal poverty line.
- Each year obesity is associated with 100,000 premature deaths. Severe obesity may shorten life expectancy up to 14 years. 75% of hypertension cases are related to obesity.

Figure 1 and Figure 2 shows the prevalence of obesity among U.S. adults by state and territory for 2011 and 2017 respectively. The graph clearly shows a noticeable change in the prevalence of obesity among the states and territories. 7 states now have over 35% or more of the population battling obesity. That's a stark difference from just a little more than a decade ago, when Mississippi and West Virginia were the only states above the 30 percent mark. And today's numbers are even more startling when you consider no state had an adult obesity rate higher than 15 percent in 1985 and no state was above 20 percent in 2000. The latest National Health and Nutrition Examination Survey, NHANES (2018) shows 39.6 percent of adults and 18.4 percent of children ages 2 to 19 in America have obesity, one of the highest rates documented till date. Figure 3 shows the trends in obesity prevalence among adults aged 20 and over and youth aged 2-19 years, for U.S. 1999-2000 through 2015-2016. The graph clearly shows that the trends are increasing and steeper in 2015-2017 than 1999-2000.

The National Center for Health Statistics (NCHS) over time revises and alters/expands the cause-of-death lists with each subsequent revision of the International Classification of Diseases (ICD). When coding for obesity in ICD-9, 2011 there were 4 choices:

- 278.00 – Obesity, unspecified
- 278.01 – Morbid obesity
- 278.02 – Overweight
- 278.03 – Obesity hypoventilation syndrome

ICD-10, 2015 adds some specificity, giving us a few additional options:

- E66.01 – Morbid (severe) obesity due to excess calories
- E66.09 – Other obesity due to excess calories
- E66.1 – Drug-induced obesity
- E66.2 – Morbid (severe) obesity with alveolar hypoventilation
- E66.3 – Overweight
- E66.8 – Other obesity
- E66.9 – Obesity, unspecified

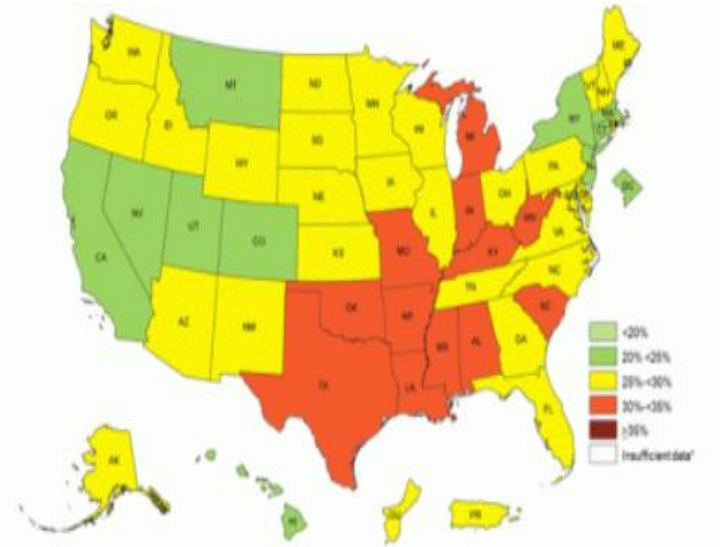

Figure 1 Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2011

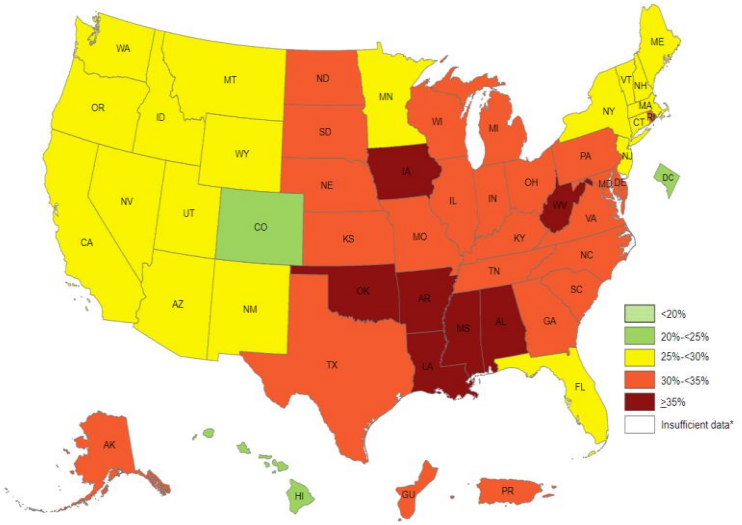

Figure 2 Prevalence of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2017

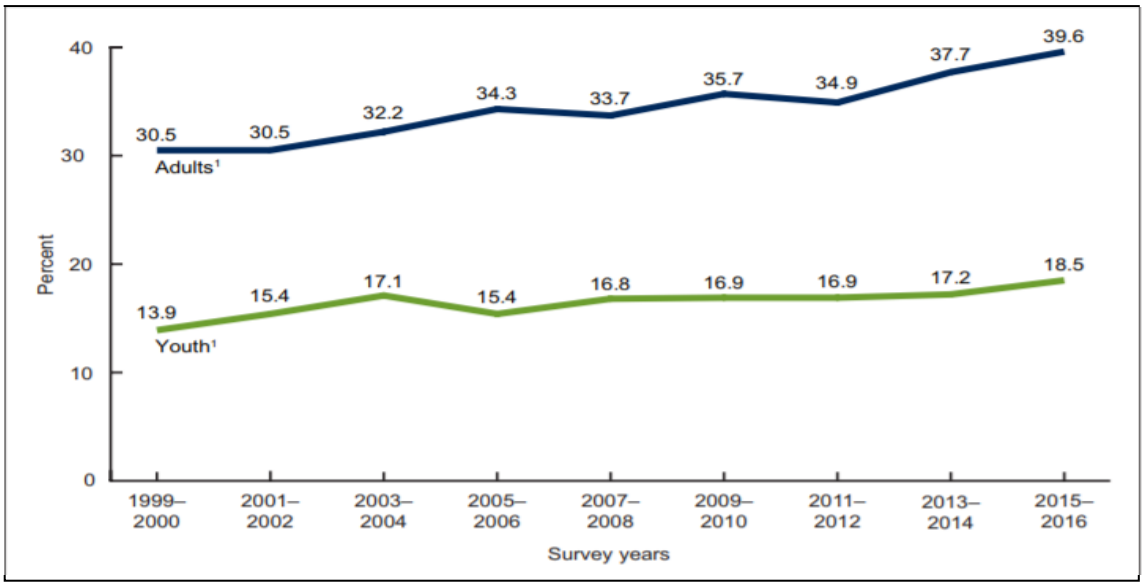

Figure 3 Trends in Obesity Prevalence Among Adults Aged 20 and Over and Youth Aged 2-19 Years, for U.S. 1999-2000 Through 2015-2016.

Both ICD-9 and ICD-10 guidelines instruct us to use an additional code to identify body mass index (BMI). In ICD-9 we look to category V85 and in ICD-10 we look to category Z68 (Kuhle et al., 2011). Both classifications classify the BMI by age. These coding rules improve the usefulness of mortality statistics by giving preference to certain categories, by consolidating conditions, and by systematically selecting a single cause of death from a reported sequence of conditions. Figure 4 shows the percent distribution of the 10 leading causes of death, by sex, United States, 2016. Being overweight or obese can result in a higher risk of developing the top 10 diseases listed below.

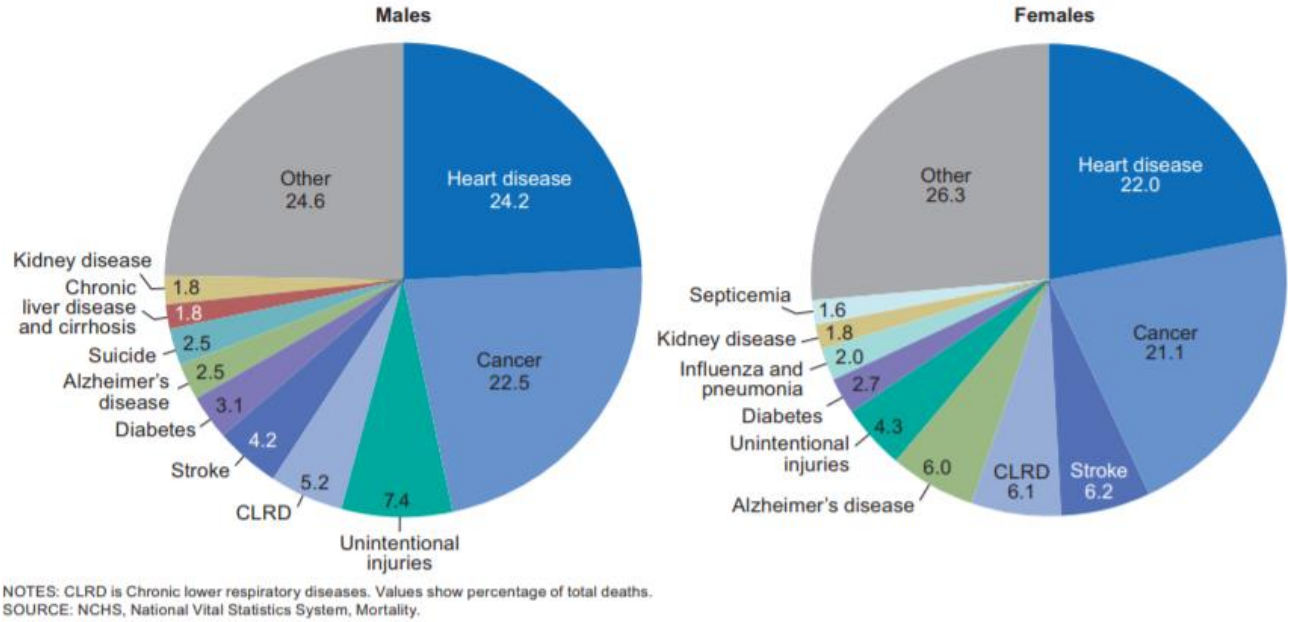

Figure 4 Percent Distribution of the 10 Leading Causes of Death, by Sex, United States, 2016

Obesity is a complex health issue to address. Obesity results from a combination of causes and contributing factors, including individual factors such as behavior and genetics. Behaviors can include dietary patterns, physical activity, inactivity, medication use, and other exposures. Additional contributing factors in our society include the food and physical activity environment, education and skills, and food marketing and promotion. Obesity is a serious concern because it is associated with poorer mental health outcomes, reduced quality of life with a number of health conditions, including hypertension, high cholesterol levels, type 2 diabetes, cardiovascular disease, several types of cancer, musculoskeletal disorders etc. some of the leading causes of preventable, premature death. Obesity accounts for approximately 3.4 million deaths globally every year. Obesity leads to greater healthcare expenditures, and higher risk of mortality. Obesity and its repercussions constitute an important source of morbidity, impaired quality of life and its complications can have a major bearing on life expectancy. Abdelaal et al. (2017) created a classification and grading system that can be used to assess the individual and combined impact of co-morbid conditions on mortality risk. They identified thirteen specific domains that account for morbidity and mortality in obesity. The King's Criteria and Edmonton Obesity Staging System (EOSS) were identified as useful tools for the detection and monitoring of individual patient mortality risk in obesity care.

4. Policy Measures

Race, ethnicity, gender, income, educational levels and where an adult lives, poor quality eating patterns and physical patterns play a crucial role in determining the likelihood of facing obesity. The 2015-2020 Dietary Guidelines for Americans, USDA (2015) provides guidance for choosing a healthy diet and focuses on preventing the diet-related chronic diseases that continue to affect the population. It provides five overarching guidelines that encourage healthy eating patterns, recognize that individuals will adapt to better food and beverage choices to achieve a healthy pattern, and acknowledge that all segments of our society have a role to play in supporting healthy choices. In tandem with these guidelines Americans should also be physically activity which will contribute towards a caloric balance and help manage body weight.

- Follow a healthy eating pattern across the lifespan
- Focus on variety, nutrient density, and amount
- Limit calories from added sugars and saturated fats and reduce sodium intake
- Shift to healthier food and beverage choices
- Support healthy eating patterns for all

Reversing the U.S. obesity epidemic requires a comprehensive and coordinated approach that uses policy and environmental change to transform communities into places that support and promote healthy lifestyle choices for all U.S. residents. CDC initiated the Common Community Measures for Obesity Prevention Project (the Measures Project). The Measures Project recommended a set of strategies and appropriate measures for communities and local governments can use to plan and monitor environmental and policy level changes for obesity prevention, Khan et al. (2009) This report describes the expert panel process that was used to identify 24 recommended strategies for obesity prevention and a suggested measurement for each strategy that communities can use to assess performance and track progress over time. The 24 strategies are divided into six categories: 1) strategies to promote the availability of affordable healthy food and beverages), 2) strategies to support healthy food and beverage choices, 3) a strategy to encourage breastfeeding, 4) strategies to encourage physical activity or limit sedentary activity among children and youth, 5) strategies to create safe communities that support physical activity, and 6) a strategy

to encourage communities to organize for change.

In 2017, new rules strengthened school wellness policies to ensure healthier food marketing in schools, and updated nutrition standards for the more than four million children who participate in programs associated with the Child and Adult Care Food Program. In 2018, menu labeling provisions of the Affordable Care Act took effect, covering approximately 300,000 food retail establishments nationwide; FDA estimates this will save approximately $8 billion in health costs over the next two decades. A renewed commitment to obesity prevention policies and programs, and continued innovation at the state and local levels is critical to achieving success among more children and adults in our country, CDC (2018). Effective obesity prevention efforts also require substantial investment to support multifaceted, multi-sector collaborations; merging multiple sources of public and private funding can best ensure that these efforts are sustainable as a long-term enterprise. This is particularly important for populations that have elevated risk. The Trust for America's Health (TFAH) and the Robert Wood Johnson Foundation (RWJF) recommend three guiding principles regarding obesity prevention:

- Promote policies and scale programs that take a multi-sector approach.
- Adopt and implement policies that help make healthy choices easy.
- Invest in programs that level the playing field for all individuals and families.

5. Conclusion

Obesity is an imbalance of calorie intake and activity. And though the solution sounds simple — eat less and exercise more — the root of the problem and solutions are much more complex. Weight gain in this country is primarily due to changes in our culture and lifestyles. Where we eat, what we eat, and how much we eat has changed considerably over the last 50 years with the introduction of "fast food" and processed foods. To compound the issue, we are less active as a society. We sit in front of our computers for work, entertain ourselves watching TV or playing video games, and are generally less active. This phenomenon is not likely to reverse itself anytime soon. The first step in getting healthier is getting our healthcare system on board. Similar to our mental illness crisis, healthcare needs to treat obesity like a disease and not a stigma or a lifestyle choice. Obesity may result from poor information and addictive behavior and/or as a result of living in an increasingly obesogenic environment, interventions will need to be multifaceted to ensure the best chance of success. Nutrition Assistance, Nutrition Information and Education, Child Care and Education Requirements, Community Policies and Programs, Fiscal Policies to Promote Nutrition, Health Coverage and Programs could go a long way if successfully implemented.

References

Abdelaal M., W. Le Roux Carle, and Docherty G. Neil (April 2017). "Morbidity and mortality associated with obesity", *Annals of Translational Medicine*, Vol. 5, No. 7, pp 1-12.

Adams K. F., Schatzkin A., Harris T. B., Kipnis V., Mouw T. and Ballard-Barbash R. et al. (2006). "Overweight, obesity, and mortality in a large prospective cohort of persons 50 to 71 years old", *New England Journal of Medicine*, Vol. 355, No. 8, pp. 763-778.

Bhattacharya J, Sood N, 'Health insurance and the obesity externality', NBER Working paper, 2006 pp 1-48. Available from: http://www.randproject.org/pubs/ working_ papers/2006/RAND_WR340.pdf

Burkhauser R. V. and Cawley J. (2004). "Obesity, disability, and movement onto the disability insurance rolls", Michigan Retirement Research Center (MRRC), available online at: http://www.mrrc. isr.umich.edu/publications/Papers/pdf/wp089.pdf.

Burton W. N., Chen C. Y., Schutz A. M. and Edington D. W. (1998). "The economic costs associated with body mass index in a workplace", *Journal of Occupational and Environmental Medicine*, Vol. 40, No. 9, pp. 786-792.

Cawley J. (2010). "The economics of childhood obesity", *Health Affairs*, Vol. 29, No. 3, pp. 364-371.

Cawley J. and Meyerhoefer C. (2012). "The medical care costs of obesity: An instrumental variables approach", *Journal of Health*

Economics, Vol. 31, No. 1, pp. 219-230.

Centers for Disease Control and Prevention, Overweight and Obesity (2019). Available online at: https://www.cdc.gov/obesity/resources/factsheets.html.

Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion (March 25, 2019). Available online at: https://chronicdata.cdc.gov/Nutrition-Physical-Activity-and-Obesity/Percent-of-adults -aged-18-and-older-who-have-obesi/cwdv-83mi.

Dannenberg A., Burton D. and Jackson R. (2004). "Economic and environmental costs of obesity: The impact on airlines", *American Journal of Preventive Medicine*, Vol. 27, No. 3, p. 264.

Finkelstein A. Eric, Ruhm J. Christopher and Kosa M. Katherine (2005). "Economic consequences of obesity", *Annual Review of Public Health*, Vol. 26, pp. 239-257.

Finkelstein A. Eric and Strombotne L. Kiersten (May 2010). "The economics of obesity", *The American Journal of Clinical Nutrition*, Vol. 91, No. 5, pp. 1520S-1524S.

Frone M. R. (2008). "Obesity and absenteeism among US workers: Do physical health and mental health explain the relation?', *Journal of Workplace Behavioral Health*, Vol. 22, No. 4, pp. 65-79.

Geier A. B., Foster G. D. and Womble L. G. et al. (2007). "The relationship between relative weight and school attendance among elementary school children", *Obesity* (Silver Spring), Vol. 15, No. 8, pp. 2157-2161.

Gorsky R., Pamuk E., Williamson D., Shaffer P. and Koplan J. (1996). "The 25-year health care costs of women who remain overweight after 40 years of age", *American Journal of Preventive Medicine*, Vol. 12, pp. 388-394.

Gortmaker S. L., Must A., Perrin J. M., Sobol A. M. and Dietz W. (1993). "Social and economic consequences of overweight in adolescence and young adulthood", *New England Journal of Medicine*, Vol. 329, No. 14, pp. 1008-1012.

Groessel E. J., Kaplan R. M., Barrett-Connor E. and Ganiats T. G. (2004). "Body mass index and quality of well-being in a community of older adults", *American Journal of Preventive Medicine*, Vol. 26, No. 2, pp. 126-129.

Hales C., Carrol M., Fryar C. and Ogden C. (October 2017). "Prevalence of obesity among adults and youth: United States, 2015-2016", NCHS, Data Brief No. 288.

Hammond R. and Levine R. (2010). "The economic impact of obesity in the United States", *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, Vol. 3, pp. 285-295.

Heron M. (2018). "National vital statistics reports: Deaths — Leading causes for 2016", *Division of Vital Statistics*, Vol. 67, No. 6, pp. 1-77.

Howarth A., Quesada J., Silva J., Judycki S. and Mills P. (2018). "The impact of digital health interventions on health-related outcomes in the workplace: A systematic review", *Digital Health*, Vol. 4, pp. 1-18.

Jacobson S. H. and King D. M. (2009). "Measuring the potential for automobile fuel savings in the US: The impact of obesity", *Transport Research Part D: Transport and Environment*, Vol. 14, No. 1, pp. 6-13.

Jacobson S. H. and McLay L. A. (2006). "The economic impact of obesity on automobile fuel consumption", *The Economist*, Vol. 51, pp. 307-323.

Kaestner R., Grossman M. and Yarnoff B. (2009). "Effects of weight on adolescent educational attainment", NBER Working Paper 2009, available online at: http://www.nber. org/papers/w14994.pdf.

Khan L. K., Sobush K., Keener D., Goodman K., Lowry A., Kakietek J. and Zaro S. (2009). "Recommended community strategies and measurements to prevent obesity in the United States", *Morbidity and Mortality Weekly Report: Recommendations and Reports*, Vol. 58, No. 7, pp. 1-29.

Kuhle S., Kirk S. F. L., Ohinmaa A. and Veugelers P. J. (2011). "Comparison of ICD code-based diagnosis of obesity with measured obesity in children and the implications for health care cost estimates", *BMC Medical Research Methodology*, Vol. 11, No. 173, pp. 1-5.

Lakdawalla D. and Philipson T. (2002). "The growth of obesity and technological change: A theoretical and empirical examination", National Bureau Economic Research Working Paper No. 8946, Cambridge, MA.

Lehnert T., Sonntag D., Konnopka A., Riedel-Heller S. and Konig H. (April 2013). "Economic cost of overweight and obesity", *Best Practice & Research Clinical Endocrinology & Metabolism*, Vol. 27, No. 2, pp. 105-115.

Lightwood J., Bibbins-Domingo K., Coxson P., Wang C., Williams L. and Goldman L. (2009). "Forecasting the future economic burden of current adolescent overweight: An estimate of the coronary heart disease policy model", *American Journal of Public Health*, Vol. 99, No. 12, pp. 2230-2237.

Michaelowa A. and Dransfield B. (2008). "Greenhouse gas benefits of fighting obesity", *Ecological Economics*, Vol. 66, No. 2-3, pp. 298-308.

National Center for Health Statistics (NCHS), 2015.

National Health and Nutrition Examination Survey (NHANES), 2018.

Poveda A., Koivula R. W., Ahmad S., Barroso I., Hallmans G., Johansson I., Renstrom F. and Franks P. W. (2016). "Innate biology versus lifestyle behaviour in the aetiology of obesity and type 2 diabetes: The Glacier study", *Diabetologia*, Vol. 59, No. 3, pp 462-471.

Philipson T. (2001). "The world-wide growth in obesity: An economic research agenda", *Health Economics*, Vol. 10, No. I, pp. 1-7.

Pronk N. P., Goodman M. J., O'Connor P. J., Martinson B. C. (1999). "Relationship between modifiable health risks and short-term charges", *Journal of American Medical Association*, Vol. 282, No. 23, pp. 2235-2239.

Ricci J. A. and Chee E. (2005). "Lost productive time associated with excess weight in the US workforce", *Journal of Occupational and Environmental Medicine*, Vol. 47, No. 12, pp. 1227-1234.

Sabia J. J. (2007). "The effect of body weight on adolescent academic performance", *Southern Economic Journal*, Vol. 73, No. 4, pp 871-900.

Serxner S. A., Gold D. B. and Bultman K. K. (2001). "The impact of behavioral health risks on worker absenteeism", *Journal of Occupational and Environment Medicine*, Vol. 43, No. 4, pp. 347-354.

Trust for America's Health, Robert Wood Johnson Foundation (2018). "The State of Obesity: Better policies for healthier America".

Thompson D., Edelsberg J., Colditz G. A., Bird A. P. and Oster G. (1999). "Lifetime health and economic consequences of obesity", *Arch Intern Med.*, Vol. 159, No. 18, pp. 2177-2183.

Thompson D., Edelsberg J., Kinsey K. L. and Oster G. (1998). "Estimated economic costs of obesity to US business", *American Journal of Health Promotion*, Vol. 13, No. 2, pp. 120-127.

Tsai S. P., Ahmed F. S., Wendt J. K., Bhojani F. and Donnelly R. P. (2008). "The impact of obesity on illness absence and productivity in an industrial population of petrochemical workers", *Annals of Epidemiology*, Vol. 18, No. 1, pp. 8-14.

US Census Bureau, 2019.

U.S. Department of Health and Human Services and U.S. Department of Agriculture (December 2015). *2015-2020 Dietary Guidelines for Americans* (8th ed.).

Available online at: https://www.dietaryguidelines.gov/sites/default/files/2019-05/2015-2020_Dietary_Guidelines.pdf

Available online at: https://www.icd10monitor.com/coding-current-events-obesity.

Van Itallie T. B. (1985). "Health implications of overweight and obesity in the United States", *Annals of Internal Medicine*, Vol. 103, pp. 983-988.

Wang Y. C., McPherson K., Marsh T., Gortmaker S. L. and Brown M. (2011). "Health and economic burden of the projected obesity trends in the USA and the UK", *Lancet*, Vol. 378, pp. 815-825.