

A New Approach to Tackling America's Weight Problem – Making America Stronger and Improving Lives

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Sometimes the solution to a difficult problem is staring you right in the face, but you just cannot see it. Or you get so bombarded by information, as is the case today, that it gets increasingly difficult to sift through it, process it, and come to a logical conclusion.

One such important issue for which I will delve into the health, economic, national security, and personal fulfillment aspects of, is America's longstanding and ongoing struggle with overweightedness and obesity across the United States population. I will point out how this weight problem is putting great strain on the healthcare system and driving unsustainable increases in healthcare expenditures. Following this I will underscore the health ramifications of being overweight, which unfortunately there are many and some can be severe. Tied to this, I will explain the relationships between having a high body mass index (BMI) and certain diseases, cancer in particular. Next, I will call attention to the overweightedness of our young adult population and how this makes our national defense vulnerable. And, in order to counter this trend, I will offer various solutions on how we can tackle this problem for the long-term.

My underlying belief is that we are putting too many resources into and spending too much on researching medical conditions and diseases that are a result of being overweight or obese as well as related pharmaceuticals. A much better, wiser, and more efficient and cost-effective approach is attacking the root-cause. Some people in academia and medical research may not like or favor my perspective, and they have that right, but this about the overall health and vitality of the United States which trumps any organization's purpose or cause. In my view, clinical research should not be done for the researcher's sake. The means should justify the ends and I believe we have reached a point where we must take a step back and think carefully about how we are utilizing national monetary resources, of which there will be less going forwards because of demographic realities. Total U.S. spending on medical and health research and development was \$194.2 billion in 2018. This equates to about 1.0% of the total GDP in 2018, which was \$20.6 trillion. This may not seem like a lot, but as a comparison, total U.S. automobile manufacturing accounted for about 3.0% of the GDP in 2018. According to Research America investment in medical health research and development (R&D) grew 20.6% from 2013 to 2016. The question we must ask ourselves as a country is how much we are willing to spend on something that is not a guarantee of improvements or results. According to an essay by John P. A. Ioannidis, Stanford University Professor of Medicine (Stanford prevention research - epidemiology and population health), entitled, "*Why Most Clinical Research Is Not Useful*", "Waste across medical research (clinical or other types) has been estimated as consuming 85% of the billions spent each year."

This article is not meant to criticize or belittle anyone who is overweight. I'll be the first one to admit that I would benefit from losing some pounds. I have been active and athletic all of my

life, yet I am finding it more and more challenging to remain at an acceptable weight as I approach my late 40s. With that, this article is meant to raise awareness around the related issues, educate readers on clinical consequences of being overweight or obese, bring attention to related economic and national defense problems, and then bring to light ideas for solutions. But, one thing that we cannot do is ignore this problem or sweep it under the rug. In doing so, we would be discounting an important integral in solving many of America's challenges in the 21st Century. We as a nation cannot afford situations that impede our progress or ability to build a sounder economy and a better future.

Healthcare costs driven by obesity related illnesses have risen to approximately \$190 Billion per year. This represents 21% of all medical spending. To put this in perspective, this is 26% of the total U.S. annual budget for public education (\$739 Billion) and this amount could buy about 14 modern state-of-the-art, Ford Class U.S. Navy Aircraft Carriers.

Total U.S. healthcare spending in 2019 amounted to \$3.8 trillion. This figure equates to 17.7% of the total U.S. Gross Domestic Product (GDP) in 2019, which was \$21.43 trillion. Looking back at historical trends of total U.S. healthcare spending as a percentage of GDP, in 2000 it was 13.3%, in 1990 it was 12.1%, in 1980 it was 8.9% and in 1960 it was 5.0%. If this trend continues, it will put the figure above 20% at least by 2040. What is the problem with this you ask? The answer revolves around having a diversified, balanced economy with manufacturing, services, agriculture, transportation, healthcare, national defense, etc. making up appropriate shares of the total GDP. For one sector to inflate beyond 20% of GDP would be unbalanced and would not make for a healthy, robust economy. You also want to have a diversified workforce with varied skills and if we create an economy too heavily weighted towards healthcare alone, it then detracts from building and investing in talented workers in other areas such as non-healthcare related science and engineering, education (other than healthcare curriculum), non-healthcare related business, recreation and entertainment, etc.. As it stands, health care employment as a percent of total employment is about 12% for the U.S..

As per above, we have to contain national healthcare spending as it is growing at an unsustainable rate. Making America healthier will help to make healthcare expenditure growth more sustainable and allow for a balanced, healthy economy. A healthier U.S. population equates with a stronger workforce which can drive increased economic prosperity, bolstering the quality of life for all Americans.

Being healthier will also allow people to live with more energy and vitality to do their things and activities which they love; hence live more fulfilling lives.

There is so much focus in our society on retirement, but if you are not healthy, it will be hard to enjoy these "Golden Years". You don't want to spend half of this time in a hospital or visiting various Doctors' offices. Additionally, unexpected healthcare expenses can really throw a wrench in your retirement plans and lifestyle. For example, a heart catheterization where a Percutaneous Coronary Intervention (PCI) is performed, such as balloon angioplasty, atherectomy and/or coronary stent implantation can cost anywhere from \$30,000 to over \$100,000 for more complex cases. The average cost of a hip replacement today is \$32,000. Just

imagine how much these procedures will cost in 20 – 30 years from now? I use these examples because an overweight condition will increase your chances of needing either of these procedures. An overabundance of adipose tissue is a risk factor for coronary artery disease (CAD) and being overweight, and especially obesity will put great stress on your musculoskeletal structure, prematurely wearing out joints.

METRICS FOR OVERWEIGHTEDNESS AND OBESITY

How does one know she or he is overweight or obese and what are the metrics that classify these conditions? Let's take a look.

According to the Centers for Disease Control (CDC), "Weight that is higher than what is considered as a healthy weight for a given height is described as overweight or obesity. Body Mass Index, or BMI, is used as a screening tool for overweight or obesity."

The medical definition of obesity is "Well above one's normal weight. A person has traditionally been considered to be obese if they are more than 20% over their ideal weight. That ideal weight must take into account the person's height, age, sex, and build."

Per the CDC:

Adult Body Mass Index (BMI)

- If your BMI is less than 18.5, it falls within the underweight range.
- If your BMI is 18.5 to <25, it falls within the healthy weight range.
- If your BMI is 25.0 to <30, it falls within the overweight range.
- If your BMI is 30.0 or higher, it falls within the obesity range.

Obesity is frequently subdivided into categories:

- Class 1: BMI of 30 to < 35
- Class 2: BMI of 35 to < 40
- Class 3: BMI of 40 or higher. Class 3 obesity is sometimes categorized as "severe" obesity.

BODY MASS INDEX TABLE

BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Height (inches)	Body Weight (pounds)																
58	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
59	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
60	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
61	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
62	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
63	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
64	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
65	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
66	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
67	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
68	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
69	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
70	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
71	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
72	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
73	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
74	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
75	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279
76	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287

OVERWEIGHT AND OBESE – THE NUMBERS

The number of Americans who are overweight are in the majority. And a worrisome trend is the growing percentage of Americans who fall within the above parameters for obesity. According to Healthline:

“1. More than *one-third* of adults in the United States are obese.

In the United States, 36.5 percent of adults are obese. Another 32.5 percent of American adults are overweight. In all, more than *two-thirds* of adults in the United States are overweight or obese.

2. Obesity affects 1 in 6 children in the United States.

Around 17 percent of American children ages 2 to 19 are obese. That’s more than 12.7 million American children. One in 8 preschoolers is obese. The good news is obesity rates among preschool children have been falling in recent years.”

According to MedPage:

“Over 73% of U.S. adults are overweight or obese.”

This means that only **27%** of U.S. adults fall within a healthy, normal weight range.

And According to the CDC:

Adults

- Percent of adults aged 20 and over with obesity: 42.5% (2017-2018)
- Percent of adults aged 20 and over with overweight, including obesity: 73.6% (2017-2018)

Children and adolescents

- Percent of adolescents aged 12-19 years with obesity: 21.2% (2017-2018)
- Percent of children aged 6-11 years with obesity: 20.3% (2017-2018)
- Percent of children aged 2-5 years with obesity: 13.4% (2017-2018)

According to the Institute for Health Metrics and Evaluation at the University of Washington:

“The highest proportion of overweight and obese people – 13% of the global total – live in the United States, a country which accounts for only 5% of the world’s population, according to a first-of-its-kind analysis of trend data from 188 countries.”

“An estimated 160 million Americans are either obese or overweight. Nearly three-quarters of American men and more than 60% of women are obese or overweight. These are also major challenges for America’s children – nearly 30% of boys and girls under age 20 are either obese or overweight, up from 19% in 1980.”

Obesity is a common, serious, and costly disease

- “The prevalence of obesity was 42.4% in 2017~2018.
- From 1999–2000 through 2017–2018, the prevalence of obesity increased from 30.5% to 42.4%, and the prevalence of severe obesity increased from 4.7% to 9.2%.
- Obesity-related conditions include heart disease, stroke, type 2 diabetes and certain types of cancer that are some of the leading causes of preventable, premature death.
- The estimated annual medical cost of obesity in the United States was \$147 billion in 2008 US dollars; the medical cost for people who have obesity was \$1,429 higher than those of normal weight.”

Childhood Obesity Facts & Prevalence in the United States

“Childhood obesity is a serious problem in the United States, putting children and adolescents at risk for poor health. Obesity prevalence among children and adolescents is still too high.

For children and adolescents aged 2-19 years in 2017-2018:

- The prevalence of obesity was 19.3% and affected about 14.4 million children and adolescents.

- Obesity prevalence was 13.4% among 2- to 5-year-olds, 20.3% among 6- to 11-year-olds, and 21.2% among 12- to 19-year-olds. Childhood obesity is also more common among certain populations.
- Obesity prevalence was 25.6% among Hispanic children, 24.2% among non-Hispanic Black children, 16.1% among non-Hispanic White children, and 8.7% among non-Hispanic Asian children.”

What are some of the major drivers of the growth of the obese population in the United States over the last 40 plus years?

According to Public Health (www.publichealth.org):

“The U.S. Department of Agriculture (USDA) reports that the average American ate almost 20% more calories in the year 2000 than they did in 1983, thanks, in part, to a boom in meat consumption. Today, each American puts away an average of 195lbs of meat every year, compared to just 138lbs in the 1950's. Consumption of added fats also shot up by around two thirds over the same period, and grain consumption rose 45% since 1970.”

“Research published by the World Health Organization found that a rise in fast food sales correlated to a rise in body mass index, and Americans are notorious for their fast-food consumption — such food makes up about 11% of the average American diet. Another study demonstrates the full effect added sugars from soda and energy drinks are wreaking havoc on American waistlines. So it is not just how much we eat, but what we eat.”

FROM THE AMERICAN MEDICAL ASSOCIATION:

“From 2011 to 2012, more than 34 percent of U.S. adults and nearly 17 percent of adolescents age 2 to 19 were obese, according to a 2014 study published in JAMA. The condition also contributed an estimated \$147 billion in U.S. medical costs, and the annual medical costs for people who are obese were \$1,429 higher than those of non-obese people.”

“Obesity has been officially recognized as a disease by the American Medical Association, an action that could put more emphasis on the health condition by doctors and insurance companies in order to minimize its effects.”

“Dr. Patrice Harris, a member of the association’s board commented in a statement, “Recognizing obesity as a disease will help change the way the medical community tackles this complex issue that affects approximately one in three Americans.””

“Obesity has long been viewed as an individual problem, treated primarily by individual or family-based medical and/or psychological methods. As noted in Chapter 1, the expansion of the obesity epidemic to affect diverse age groups, socioeconomic strata, and racial or ethnic groups and communities in the United States and globally has caused a paradigm shift toward preventive strategies that can reach whole communities and populations, as well as a sense of urgency in mounting these strategies (Kumanyika et al., 2002, 2008; Public Health Service, 2001; WHO, 2000).”

ECONOMIC COSTS OF AN OVERWEIGHT POPULATION

There are direct and indirect cost drivers of obesity.

Direct costs can be defined as those that are the direct result from outpatient and inpatient healthcare services (i.e., surgery, medical imaging, pharmaceuticals, etc.).

Indirect costs can be defined as resources which have been diminished as a result of being ill or being diagnosed with a health condition. The indirect costs include:

- Lost income due to days missed stemming from an illness (i.e., obese employees tend to miss more days from work due to short-term absences, long-term disability, and early aged death).
- Higher life insurance premiums for employers
- Lower overall wages

According to Harvard School of Public Health:

“One widely-quoted estimate from Finkelstein and colleagues, based on data from the U.S. Medical Expenditure Panel Survey (MEPS), found that obesity was responsible for about 6 percent of medical costs in 1998, or about \$42 billion (in 2008 dollars). By 2006, obesity was responsible for closer to 10 percent of medical costs—nearly \$86 billion a year. Spending on obesity-related conditions accounted for an estimated 8.5 percent of Medicare spending, 11.8 percent of Medicaid spending, and 12.9 percent of private-payer spending.”

“Looking ahead, researchers have estimated that by 2030, if obesity trends continue unchecked, obesity-related medical costs alone could rise by \$48 to \$66 billion a year in the U.S..”

A study by Adam Biener, PhD, John Cawley, PhD, and Chad Meyerhoefer, PhD, “The High and Rising Costs of Obesity to the U.S. Healthcare System” points out the following:

“Our past research, which is based on data from the Medical Expenditure Panel Survey (MEPS), indicates that, between 2005 and 2010, the amount by which obesity raised medical costs per obese adult rose from \$3070 to \$3508 (both measured in year 2010 dollars), an increase of 14.3 percent. During that same period, the aggregate costs of obesity in the adult, noninstitutionalized population of the US rose from \$212.4 billion to \$315.8 billion (both in 2010 dollars), an increase of 48.7 percent; this large increase is due to three factors: (1) an increase in costs per obese individual; (2) an increase in the population, so even if the prevalence of obesity remained constant there would be more obese individuals; (3) an increase in the prevalence of obesity.”

“The table below indicates that we estimate that obesity raises the medical care costs of obese adults by an average of \$3429 (in 2013 dollars); this is slightly less than the point estimate for 2010 (\$3748 in 2013 dollars), but the difference is not statistically significant.”

Table 1

Increases in annual individual medical expenditures due to obesity and a one unit increase in BMI for different groups of adults with biological children

Sample	Total expenditures		Third party expenditures	
	BMI \$ (SE)	Obesity \$ (SE)	BMI \$ (SE)	Obesity \$ (SE)
Total (N = 31,591)	197 (43)	3429 (799)	180 (41)	3210 (793)
Males (N = 12,349)	244 (94)	3565 (1437)	225 (87)	3395 (1381)
Females (N = 19,242)	179 (59)	3359 (804)	164 (38)	3116 (783)
White (N = 12,895)	144 (59)	2557 (1173)	134 (54)	2454 (1084)
Non-White (N = 18,696)	261 (71)	4086 (1050)	240 (70)	3799 (1034)
Private insurance (N = 19,384)	216 (53)	3846 (1077)	199 (51)	3581 (1041)
Medicaid (N = 4464)	182 (102)	2954 (1711)	170 (96)	2809 (1633)
Uninsured (N = 7152)	91 (51)	1689 (922)	N/A	N/A

Notes: Standard errors are adjusted for the complex design of the MEPS, and all dollar values are reported in 2013 USD. Bolded estimates are statistically significant at $\alpha = 0.05$. Data: MEPS, 2006–2013

Furthermore, pointing to the high healthcare costs that overweightedness and obesity generate, The Milken Institute (www.milkeninstitute.org) points out the following:

“The prevalence of obesity in the U.S. population has increased steadily since the 1960s— from 3.4 percent of adults in 1962 to 39.8 percent in 2016, the year of the most recent Centers for Disease Control and Prevention data. In all, 180.5 million people—or 60.7 percent of the population ages 2 and over—were either obese or overweight.

In 2016, 100.3 million U.S. residents had obesity and another 80.2 million were overweight.

The burden of American obesity, and the chronic diseases for which it is a contributing factor, has reached record economic heights.

- *In 2016, chronic diseases driven by the risk factor of obesity and overweight accounted for \$480.7 billion in direct health care costs in the U.S., with an additional \$1.24 trillion in indirect costs due to lost economic productivity.*
- *The total cost of chronic diseases due to American obesity and overweight was \$1.72 trillion—equivalent to 9.3 percent of the U.S. gross domestic product (GDP).*

- *Obesity as a risk factor is by far the greatest contributor to the burden of chronic diseases in the U.S., accounting for 47.1 percent of the total cost of chronic diseases nationwide.”*

And finally, U.S. News & World Reports covered this issue:

“Overall, health care costs for obese adults were nearly \$1,900 higher each year, compared to their normal-weight peers. And once adults were in the "obese" category, even incremental increases in weight meant additional health care expenses, the researchers found.”

“Not surprisingly, severe obesity carried the heftiest price tag -- costing an additional \$3,100 per person, versus Americans with a normal BMI.”

THE CAUSES OF OBESITY

According to the Mayo Clinic (www.mayoclinic.org):

“Although there are genetic, behavioral, metabolic and hormonal influences on body weight, obesity occurs when you take in more calories than you burn through exercise and normal daily activities. Your body stores these excess calories as fat.

Most Americans' diets are too high in calories — often from fast food and high-calorie beverages. People with obesity might eat more calories before feeling full, feel hungry sooner, or eat more due to stress or anxiety.

Risk factors

Obesity usually results from a combination of causes and contributing factors:

Family inheritance and influences

The genes you inherit from your parents may affect the amount of body fat you store, and where that fat is distributed. Genetics may also play a role in how efficiently your body converts food into energy, how your body regulates your appetite and how your body burns calories during exercise.

Obesity tends to run in families. That's not just because of the genes they share. Family members also tend to share similar eating and activity habits.

Lifestyle choices

Unhealthy diet. A diet that's high in calories, lacking in fruits and vegetables, full of fast food, and laden with high-calorie beverages and oversized portions contributes to weight gain.

Liquid calories

People can drink many calories without feeling full, especially calories from alcohol. Other high-calorie beverages, such as sugared soft drinks, can contribute to significant weight gain.

Inactivity

If you have a sedentary lifestyle, you can easily take in more calories every day than you burn through exercise and routine daily activities. Looking at computer, tablet and phone screens is a sedentary activity. The number of hours you spend in front of a screen is highly associated with weight gain.

Certain diseases and medications

In some people, obesity can be traced to a medical cause, such as Prader-Willi syndrome, Cushing syndrome and other conditions. Medical problems, such as arthritis, also can lead to decreased activity, which may result in weight gain.

Some medications can lead to weight gain if you don't compensate through diet or activity. These medications include some antidepressants, anti-seizure medications, diabetes medications, antipsychotic medications, steroids and beta blockers.

Social and economic issues

Social and economic factors are linked to obesity. Avoiding obesity is difficult if you don't have safe areas to walk or exercise. Similarly, you may not have been taught healthy ways of cooking, or you may not have access to healthier foods. In addition, the people you spend time with may influence your weight — you're more likely to develop obesity if you have friends or relatives with obesity.

Age

Obesity can occur at any age, even in young children. But as you age, hormonal changes and a less active lifestyle increase your risk of obesity. In addition, the amount of muscle in your body tends to decrease with age. Generally, lower muscle mass leads to a decrease in metabolism. These changes also reduce calorie needs, and can make it harder to keep off excess weight. If you don't consciously control what you eat and become more physically active as you age, you'll likely gain weight.

Other factors

Pregnancy

Weight gain is common during pregnancy. Some women find this weight difficult to lose after the baby is born. This weight gain may contribute to the development of obesity in women. Breast-feeding may be the best option to lose the weight gained during pregnancy.

Quitting smoking

Quitting smoking is often associated with weight gain. And for some, it can lead to enough weight gain to qualify as obesity. Often, this happens as people use food to cope with smoking withdrawal. In the long run, however, quitting smoking is still a greater benefit to your health than is continuing to smoke. Your doctor can help you prevent weight gain after quitting smoking.

Lack of sleep

Not getting enough sleep or getting too much sleep can cause changes in hormones that increase your appetite. You may also crave foods high in calories and carbohydrates, which can contribute to weight gain.

Stress

Many external factors that affect your mood and well-being may contribute to obesity. People often seek more high-calorie food when experiencing stressful situations.

Microbiome

Your gut bacteria are affected by what you eat and may contribute to weight gain or difficulty losing weight.

Previous attempts to lose weight

Previous attempts of weight loss followed by rapid weight regain may contribute to further weight gain. This phenomenon, sometimes called yo-yo dieting, can slow your metabolism.”

THE CLINICAL CONSEQUENCES OF BEING OVERWEIGHT OR OBESE

Now that we have closely looked at the prevalence and economic costs or economic losses due to obesity, we will now review the unfortunate many clinical problems that can result from this condition.

OBESITY AND CARDIOVASCULAR DISEASES

Given that my clinical background originates in cardiac diagnostics, the first and most worrisome result of obesity that comes to mind are cardiovascular disease, coronary artery disease (CAD) in particular. In the United States and most of the developed world, cardiovascular diseases are by far the number one cause of death for both Men and Women.

According to the Harvard School of Public Health:

“Body weight is directly associated with various cardiovascular risk factors. As BMI increases, so do blood pressure, low-density lipoprotein (LDL, or “bad”) cholesterol, triglycerides, blood sugar, and inflammation. These changes translate into increased risk for coronary heart disease, stroke, and cardiovascular death:

- *Obesity and Coronary Artery Disease. Numerous studies have demonstrated a direct association between excess body weight and coronary artery disease (CAD). The BMI-CAD Collaboration Investigators conducted a meta-analysis of 21 long-term studies that followed more than 300,000 participants for an average of 16 years. Study participants who were overweight had a 32 percent higher risk of developing CAD, compared with participants who were at a normal weight; those who were obese had an 81 percent higher risk. Although adjustment for blood pressure and*

cholesterol levels slightly lowered the risk estimates, they remained highly significant for obesity. The investigators estimated that the effect of excess weight on blood pressure and blood cholesterol accounts for only about half of the obesity-related increased risk of coronary heart disease.

- *Obesity and Stroke. Ischemic (clot-caused) stroke and coronary artery disease share many of the same disease processes and risk factors. A meta-analysis of 25 prospective cohort studies with 2.3 million participants demonstrated a direct, graded association between excess weight and stroke risk. Overweight increased the risk of ischemic stroke by 22 percent, and obesity increased it by 64 percent. There was no significant relationship between overweight or obesity and hemorrhagic (bleeding-caused) stroke, however. A repeat analysis that statistically accounted for blood pressure, cholesterol, and diabetes weakened the associations, suggesting that these factors mediate the effect of obesity on stroke.*
- *Obesity and Cardiovascular Death. In a meta-analysis of 26 observational studies that included 390,000 men and women, several racial and ethnic groups, and samples from the U.S. and other countries, obesity was significantly associated with death from CAD and cardiovascular disease. Women with BMIs of 30 or higher had a 62 percent greater risk of dying early from CAD and also had a 53 percent higher risk of dying early from any type of cardiovascular disease, compared with women who had BMIs in the normal range (18.5 to 24.9). Men with BMIs of 30 or higher had similarly elevated risks.”*

The Link Between Belly Fat and Higher Heart Disease Risk

According to Harvard Health:

“Muffin top. Spare tire. Beer belly. Whatever you call it, research shows that extra fat around your belly poses a unique health threat.

The study in the March 6, 2018 issue of the Journal of the American Heart Association involved about 500,000 people, ages 40 to 69, in the United Kingdom. The researchers took body measurements of the participants and then kept track of who had heart attacks over the next seven years. During that period, the women who carried more weight around their middles (measured by waist circumference, waist-to-hip ratio, or waist-to-height ratio) had a 10% to 20% greater risk of heart attack than women who were just heavier over all (measured by body mass index, or BMI, a calculation of weight in relation to height). A larger waist-to-hip ratio, in particular, appeared to be a bigger heart attack risk factor for women than for men. The analysis showed that compared with BMI, waist-to-hip ratio was 18% stronger as a heart attack predictor in women — versus 6% stronger in men.

But the message that you should take from this study should be less about the gender differences and more about the overall risks presented by central adiposity, says Dr.

Barbara Kahn, the George Richards Minot Professor of Medicine at Harvard Medical School.”

OBESITY AND DIABETES

According to the Harvard School of Public Health:

- *“The condition most strongly influenced by body weight is type 2 diabetes. In the Nurses’ Health Study, which followed 114,000 middle-age women for 14 years, the risk of developing diabetes was 93 times higher among women who had a body mass index (BMI) of 35 or higher at the start of the study, compared with women with BMIs lower than 22. Weight gain during adulthood also increased diabetes risk, even among women with BMIs in the healthy range. The Health Professionals Follow-Up Study found a similar association in men.*
- *More recently, investigators conducted a systematic review of 89 studies on weight-related diseases and then did a statistical summary, or meta-analysis, of the data. Of the 18 weight-related diseases they studied, diabetes was at the top of the risk list: Compared with men and women in the normal weight range (BMI lower than 25), men with BMIs of 30 or higher had a sevenfold higher risk of developing type 2 diabetes, and women with BMIs of 30 or higher had a 12-fold higher risk.*
- *Fat cells, especially those stored around the waist, secrete hormones and other substances that fire inflammation. Although inflammation is an essential component of the immune system and part of the healing process, inappropriate inflammation causes a variety of health problems. Inflammation can make the body less responsive to insulin and change the way the body metabolizes fats and carbohydrates, leading to higher blood sugar levels and, eventually, to diabetes and its many complications. (5) Several large trials have shown that moderate weight loss can prevent or delay the start of diabetes in people who are at high risk.”*

OBESITY AND CANCER (“LIKE THE NEW SMOKING”)

In a 2011 Los Angeles Times article by Karen Ravn, she quotes Dr. Anne McTiernan, Director of the Prevention Center at the Fred Hutchinson Cancer Research Center in Seattle: **“Obesity is almost like the new smoking”**. She expands on this: **“The effect isn’t as big for most cancers, but it’s so prevalent that it will have a huge impact.”**

“Obesity can raise the risk for a number of major cancers — colon, postmenopausal breast, endometrial, kidney and esophageal — the National Cancer Institute says, and when paired with physical inactivity, it can be held liable for 25% to 30% of cases of those cancers. Obesity has also been linked to a number of other cancers, including liver, gallbladder, pancreatic and ovarian.”

According to the Harvard School of Public Health:

“The association between obesity and cancer is not quite as clear as that for diabetes and cardiovascular disease. This is due in part to the fact that cancer is not a single disease but a collection of individual diseases.

In an exhaustive review of the data, released in 2007, an expert panel assembled by the World Cancer Research Fund and the American Institute for Cancer Research concluded that there was convincing evidence of an association between obesity and cancers of the esophagus, pancreas, colon and rectum, breast, endometrium, and kidney, and a probable association between obesity and gallbladder cancer. (15) Abdominal obesity and weight gain during adulthood were also linked with several cancers. A later systematic review and meta-analysis confirmed direct associations between obesity and cancers of the breast, colon and rectum, endometrium, esophagus, kidney, ovary, and pancreas. (4) Encouragingly, the Nurses’ Health Study has found that for overweight women who have never used hormone replacement therapy, losing weight after menopause-and keeping it off-cut their post menopausal risk by one half.”

OBESITY AND LUNG FUNCTION/RESPIRATORY DISEASE

According to the Harvard School of Public Health:

“Excess weight impairs respiratory function via mechanical and metabolic pathways. The accumulation of abdominal fat, for example, may limit the descent of the diaphragm, and in turn, lung expansion, while the accumulation of visceral fat can reduce the flexibility of the chest wall, sap respiratory muscle strength, and narrow airways in the lungs. Cytokines generated by the low-grade inflammatory state that accompanies obesity may also impede lung function.

Asthma and obstructive sleep apnea are two common respiratory diseases that have been linked with obesity. In a meta-analysis of seven prospective studies that included 333,000 subjects, obesity increased the risk of developing asthma in both men and women by 50 percent. Obesity is also a major contributor to obstructive sleep apnea (OSA), which is estimated to affect approximately one in five adults; one in 15 adults has moderate or severe obstructive sleep apnea. This condition is associated with daytime sleepiness, accidents, hypertension, cardiovascular disease, and premature mortality. Between 50 percent and 75 percent of individuals with OSA are obese. Clinical trials suggest that modest weight loss can be helpful when treating sleep apnea.”

OBESITY AND REPRODUCTION

According to the Harvard School of Public Health:

“Obesity can influence various aspects of reproduction, from sexual activity to conception. Among women, the association between obesity and infertility, primarily ovulatory infertility, is represented by a classic U-shaped curve. In the Nurses’ Health Study, infertility was lowest in women with BMIs between 20 and 24, and increased with lower and higher BMIs. This study suggests that 25 percent of ovulatory infertility in the United States may be attributable to obesity. During pregnancy, obesity increases the risk of early and late miscarriage, gestational diabetes, preeclampsia, and complications during labor and delivery. It also slightly increases the chances of bearing a child with congenital anomalies. One small randomized trial suggests that modest weight loss improves fertility in obese women.

The impact of obesity on male fertility is less clear. In a study by Hammoud and colleagues, the incidence of low sperm count (oligospermia) and poor sperm motility (asthenospermia) increased with BMI, from 5.3 and 4.5 percent, respectively, in normal-weight men to 15.6 and 13.3 percent in obese men. In contrast, a study by Chavarro and colleagues found little effect of body weight on semen quality except at the highest BMIs (above 35), despite major differences in reproductive hormone levels with increasing weight.

Sexual function may also be affected by obesity. Data from the Health Professionals Follow-Up Study, the National Health and Nutrition Examination Survey (NHANES), and the Massachusetts Male Aging Study (28) indicate that the odds of developing erectile dysfunction increase with increasing BMI. Of note, weight loss appears to be mildly helpful in maintaining erectile function. The effect of obesity on female sexual function is less clear. In a recent French study, obese women were less likely than normal-weight women to report having had a sexual partner in the preceding 12 months, but the prevalence of sexual dysfunction was similar in both groups. In a smaller survey of 118 women, Esposito and colleagues found that obese women had lower scores on the Female Sexual Function Index, with strong correlations between increasing BMI and problems with arousal, lubrication, orgasm, and satisfaction.”

OBESITY AND PREGNANCY (RISKS & ADVERSE OUTCOMES)

An editorial in the American Academy of Family Physician Journal, “Obesity in Pregnancy” by Lyrad Riley, MD, MPH; Maggie Wertz, MD; and Ian McDowell, DO [Am Fam Physician. 2018 May 1;97(9):559-561.] discusses the surrounding issues:

“According to the National Health and Nutrition Examination Survey, 33.4% of women 20 to 34 years of age are obese (body mass index [BMI] of 30 kg per m² or greater), and 58.4% are overweight (BMI of 25 kg per m² or greater). Elevated prepregnancy weight increases the absolute risk of many adverse fetal and maternal outcomes (Table 12). Obesity during pregnancy also increases the odds of spontaneous and recurrent miscarriages, suboptimal

ultrasound screening for fetal anomalies, congenital heart and neural tube defects, wound infections, maternal thromboembolic and anesthesia complications, depression, breastfeeding problems, and many other adverse outcomes. Mechanisms for these outcomes, the understanding of which is evolving, include changes in maternal hormone levels, altered gene expression, and fetal epigenetic modification.”

TABLE 1

Adjusted Predicted Absolute Risk (%) of Selected Adverse Fetal and Maternal Outcomes According to Maternal Prepregnancy BMI

BMI (kg per m ²)	Macrosomia*	Shoulder dystocia	Stillbirth	In-hospital newborn mortality	Preeclampsia	Gestational diabetes mellitus	Preterm birth†	Cesarean delivery
25	1.9	3.8	0.3	0.4	8.0	6.9	1.8	35.8
30	2.7	4.0	0.4	0.5	13.1	11.0	2.3	42.6
35	3.5	4.1	0.4	0.6	17.2	13.9	2.8	48.2
40	4.3	4.2	0.5	0.6	21.4	16.9	3.4	53.5

BMI = body mass index.

*—Birth weight greater than 9 lb, 15 oz (4,500 g).

†—Delivery before 37 weeks' gestation.

Information from reference 2.

Interventions to Reduce Obesity in Pregnancy

Weight loss before pregnancy is the most effective way to reduce maternal and fetal risks. Preconception counseling for overweight women should address the significant health risks associated with increased weight during pregnancy. Table 2 outlines interventions with limited data showing a reduction in the risk of complications from obesity in pregnancy.

Interventions to Reduce Obesity and Related Complications in Pregnancy

Intervention and outcomes	Relative risk (95% confidence interval)
Dietary interventions decrease the risk of the following ⁵ :	
Preeclampsia	0.67 (0.53 to 0.85)
Gestational diabetes mellitus	0.39 (0.23 to 0.69)
Gestational hypertension	0.30 (0.10 to 0.88)
Preterm delivery	0.68 (0.48 to 0.96)
Exercise decreases the risk of cesarean delivery ⁶	0.66 (0.46 to 0.96)
Exercise during pregnancy decreases the risk of gestational diabetes ^{7,8}	0.69 (0.37 to 1.29)
Exercise in the year before pregnancy decreases the risk of gestational diabetes ⁷	0.34 (0.17 to 0.70)
Exercise increases the likelihood of noninstrumented delivery ⁶	1.12 (1.01 to 1.24)
Low glycemic load diet, exercise, or both lead to lower rates of gestational weight gain ⁹	0.80 (0.73 to 0.87)

OBESITY, MEMORY, AND COGNITIVE FUNCTION

According to the Harvard School of Public Health:

“Alzheimer’s disease and dementia are scourges of populations that enjoy a long life span. In the United States, these diseases affect more than 7.5 million people, most of them over age 65. At 65, the estimated lifetime risk for Alzheimer’s disease is 17.2 percent in women and 9.1 percent in men. Body weight is a potentially modifiable risk factor for Alzheimer’s disease and dementia. A meta-analysis of 10 prospective cohort studies that included almost 42,000 subjects followed for three to 36 years demonstrated a U-shaped association between BMI and Alzheimer’s disease. Compared with being in the normal weight range, being underweight was associated with a 36 percent higher risk of Alzheimer’s disease while being obese was associated with a 42 percent higher risk. The associations were stronger in studies with longer

follow-up. A more recent meta-analysis demonstrated a similarly strong association between obesity and Alzheimer’s disease.”

OBESITY AND MUSCULOSKELETAL DISORDERS

According to the Harvard School of Public Health:

“Excess weight places mechanical and metabolic strains on bones, muscles, and joints. In the United States, an estimated 46 million adults (about one in five) report doctor-diagnosed arthritis. (1) Osteoarthritis of the knee and hip are both positively associated with obesity, and obese patients account for one-third of all joint replacement operations. (39) Obesity also increases the risk of back pain, lower limb pain, and disability due to musculoskeletal conditions.”

OVERWEIGHT RECRUITS: A NATIONAL DEFENSE PROBLEM

For anyone who has served in the United States military or a family member of close friend of such one, they know that in order to serve you must meet a minimum of physical and physical fitness requirements. This is assessed through an initial general physical (i.e., which can be done either through a military physician and facility or through a private physician – I went through the latter in order to serve in the U.S. Navy Reserve) and then a physical fitness test at the respective boot camp. And it does not end there. Whether you are an enlisted sailor or soldier or military officer, you must perform a Physical Readiness Test (PRT) **every 6 months** after you complete your initial training. In the U.S. Navy, this consisted of timed calisthenics (i.e., push-ups and sit-ups), followed by a timed 2-mile run. Performance assessment charts (i.e., poor, fair, good, excellent) are tailored for Men and Women. Repeated failure to meet BMI and physical performance parameters could lead a military member getting forcibly discharged from the military. My point is, if 73% of the available adult U.S. population is overweight, then it leaves a limited pool that is qualified to serve in the U.S. military. A former Joint Chiefs of Staff commented that this is a national security risk.

Key Statistics:

- About 1 in 4 young adults is too heavy to serve in the U.S. military.
- 71% of young people in the U.S. would not be able to join the military if they wanted to.

An article in the Army Times by Meghann Myers, “**America’s obesity is threatening national security, according to this study**” (10/10/2018) points out related commentary on the issue from top military officials:

“Out of all the reasons that we have future soldiers disqualify, the largest – 31 percent — is obesity,” Maj. Gen. Frank Muth, head of Army Recruiting Command, said Wednesday at AUSA’s annual meeting in Washington, D.C.”

“Researchers found that of the 29 percent of young Americans who have a high school diploma, no criminal record and no chronic medical issues, just 17 percent would be qualified

and available for active duty, and 13 percent would qualify, be available, and achieve a satisfactory score on the Armed Forces Qualification Test.”

“The obesity issue is particularly stark in the South, from which the Army draws a large number of its recruits. The Citadel, a military college in South Carolina, found that recruits in 10 Southern states had lower levels of physical fitness and were 22 percent to 28 percent more likely to be injured during basic training than their peers from other areas of the country, according to Mission: Readiness.”

“Further, a 2016 study published in the American Journal of Preventive Medicine found that “active duty soldiers with obesity were 33 percent more likely to suffer musculoskeletal injury, contributing to the more than 3.6 million injuries that occurred among active duty service members between 2008 and 2017.”

“Musculoskeletal injuries and stress fractures have also been the leading cause of medical evacuations during deployments to Iraq and Afghanistan, above and beyond other injuries.”

“As of 2015, 7.8 percent of active duty service members were considered overweight by their height and weight, up 73 percent from 2011, according to the report.”

“[The Defense Department] spends \$1.5 billion a year on obesity-related health care for active duty service members and veterans and their family members,” while losing 650,000 days of work a year for active duty troops because of obesity-related health issues, said retired Lt. Gen. Thomas Spoehr.”

ON LACK OF EXERCISE

“The National Diet and Nutrition Survey (Office for National Statistics and MRC, 2004) found that only 36 per cent of men and 26 per cent of women met the target of 30 minutes of physical activity, five days a week as recommended by the Department of Health (Joint Health Surveys Unit, 2004).”

ON CHILDHOOD OBESITY AND THE CHANCE OF BEING OBESE AS AN ADULT

“One study found that an overweight young person has a 50 per cent chance of becoming an overweight adult, and children of overweight parents have twice the risk compared with those of healthy weight parents, so targeting schools is imperative (Whitaker, 1997).”

SPEAKING TO LACK OF PHYSICIAN TRAINING AND EDUCATION ON OBESITY TREATMENT AND PREVENTION

“Despite the number and quality of guidelines on obesity prevention and treatment, a recent study found that 53 percent of health professionals reported needing more training in obesity management, and 50 percent reported needing better tools to help patients recognize obesity

risks. Recent studies have also shown that most medical schools do not provide nutrition education in the clinical portion of their curricula, leaving future physicians ill-prepared to effectively address obesity and understand how to recognize and treat the nutritional and roots causes of the condition.”

SOLUTIONS FOR AMERICA’S WEIGHT PROBLEMS

In conducting research for this article, I came across many proposed solutions to tackle America’s weight problem. As we all know, it’s always best to “catch a problem in the bud”. With that, subject matter experts on the overweight issue, who are mostly individuals with a Masters in Public Health, advocate that the best approach is avoiding the problem all together from childhood. Hence, they advocate for early BMI screenings and early intervention. Yes, overweight individuals can lose weight at any age, however it becomes more difficult as we get older, especially in our middle ages when our metabolisms experience a slow-down. And although health benefits are to be gained at any age from losing an appropriate amount of weight, there are unfortunately some footprints that are left that are hard to completely remove.

“The only sure way to avoid raising your cancer risk from hefting extra pounds is to maintain a healthy weight from the day you’re born, says Dr. Dimitrios Trichopoulos, professor of cancer prevention and epidemiology at the Harvard School of Public Health. “The roots of cancer are early in life, and overweight children frequently become overweight adults,” he says.”

“Logic suggests that losing weight — or at the very least not gaining any more — should help those people. Oncologists and weight experts alike consider that a wise move because of the overall health benefits it can provide. But there’s insufficient evidence to say for sure that holding the line on weight gain or even dropping some pounds once you’re an adult will necessarily lower cancer risk.”

However, for the large adult population who have already gone past the overweight demarcations on the BMI chart, the experts advocate for solutions driven by colleges, employers, federal, state and local governments through regulation, hospitals and healthcare institutions, and of course by the discipline of the individual.

SOLUTIONS PROPOSED BY THE CDC:

- Early care and education
- Salad bars for schools
- Healthy food environments
- Healthy hospitals
- Physical Activity Community Strategies

School Community Solutions

- Encourage children to drink water versus sugar sweetened beverages

- Make healthy foods available that comply with the National Nutritional Standards for foods in schools
- Local school wellness policy to promote student health and reduce childhood obesity
- Increase amount of time students are active during physical education classes (actually exercise during gym class)

Worksite Solutions

Worksite Wellness Program

- Management support
- Physical access to opportunities (i.e., onsite physical fitness facilities)
- Social support programs
- Provide healthy food options in employer / facility cafeterias

Interventions in Healthcare Settings

- Screening to ensure early detection of diseases / conditions
- For children aged 2 – 20, annual screening for obesity using sex-specific BMI-for-age percentiles
- Preventive counseling on diet and exercise (i.e., school nurse, health education teachers, and/or physical education teachers)

Below are some of my own ideas and solutions:

- Employer based – reimburse employees for gym memberships, fitness gear and diet programs
- Health coaches
- Community education
- Revitalized health education in schools
- Funding for local park circuit training
- More community / park public tracks and trails
- Federal subsidies for purchases of natural foods – fruits and vegetables
- Federal tax write-offs for gym memberships, fitness, gear, home gyms, etc.
- State legislation for health insurance companies to cover diet and exercise counseling

Additional Resources:

Steps to Wellness: A Guide to Implementing the 2008 Physical Activity Guidelines for Americans in the Workplace

<https://www.cdc.gov/physicalactivity/worksite-pa/toolkits/pa-toolkit.htm>

Strategies to Prevent & Manage Obesity

<https://www.cdc.gov/obesity/strategies/index.html>

You might be asking, what is meant by obesity prevention?

Obesity prevention means lowering the mean body mass index (BMI) level and decreasing the rate at which people enter the upper end of the BMI distribution.

ACCELERATING CHANGE IN MEDICAL EDUCATION:

*“Two medical schools that are part of the AMA’s Accelerating Change in Medical Education Consortium — **NYU School of Medicine** and **University of Chicago School of Medicine** — have incorporated nutrition education into their curricula. Through these new courses, both schools are working to ensure that their medical students gain the knowledge they will need to help their patients make healthy food and beverage choices when in the clinical setting.”*

PATIENT OWNERSHIP OF ISSUES:

“Dietary modification requires awareness of eating habits. The CBT model encourages using a food diary to give the individual and the health professional an idea of how, when and why food is eaten. This encourages ownership of issues and goals, and provides a basis for self-monitoring.”

GOOD NUTRITION IN CHILDHOOD AND HEALTHY FOOD CHOICES:

“Schwartz agreed. “It’s so important to focus on good nutrition in childhood,” she said. “And it’s an area that government can regulate.””

“Schwartz pointed to efforts to make fresh produce and other healthy foods more accessible to low-income Americans, through the Food Stamp and Women, Infants and Children programs. The National School Lunch Program also has updated its nutrition standards to boost kids’ fruit and vegetable intake.”

“But it’s also never too late for adults to make diet changes or start exercising. It is an uphill battle, Schwartz noted, and as people age, they are fighting the natural slowdown in metabolism.””

HAVARD HEALTH ON STRATEGIES TO LOSE WEIGHT:

“Strategies to whittle your waist and lower your risk

Keep weight gain in check. “The focus should be on limiting weight gain over all,” says Dr. Kahn. Women tend to put on pounds as they get older and after menopause. This occurs for many reasons, among them hormonal changes, a decline in muscle mass (because fat burns less calories than muscle), and in some cases lifestyle changes. Keeping tabs on your weight

— and your waist — and making changes to your daily routine can help prevent the pounds from creeping up as you go through this transition. “I don’t talk with patients as much about going on a diet as I do about creating a long-term lifestyle program that includes physical activity and sustainable dietary changes,” says Dr. Kahn. Weight that comes off slowly tends to stay off. By contrast, very rapid weight loss can trigger your body to slow its metabolism, setting the stage for the weight to be regained quickly.

Get moving. It’s probably no surprise that increasing the amount of exercise you do should be a goal if you’re looking to keep your waistline in check. “I’m a big proponent of regular exercise,” says Dr. Kahn. If you’re squeezed for time, fit it in where you can — for instance, a half-hour walk outside the office at noon or before you drive home for the day. “It doesn’t have to be excessively vigorous. You don’t need to go to the gym and change your clothes,” she says. Just being physically active can help improve your metabolic health. Even getting up to walk around periodically during work can be beneficial. Regular physical activity may not always help you lose weight, but again, it can help you maintain a healthy weight, and also improve blood sugar for people with diabetes. Having a higher proportion of muscle mass can help you burn more calories, so adding strength training at least twice a week, focusing on all the major muscle groups, may also help you maintain your weight.

Unfortunately, avoiding weight gain around the middle may be easier for some women than others, as some people are simply more prone to adding extra pounds in the belly. Research may one day help to uncover new ways to head off this dangerous type of fat and, in turn, reduce the risk for diabetes and cardiovascular disease. Certain newer medications used to treat people with diabetes — known as sodium-linked glucose transport inhibitors — have the interesting side effect of inducing weight loss and reducing visceral fat, says Dr. Kahn. “This does point to the possibility that there may be some physiological mechanisms that target visceral adiposity,” says Dr. Kahn. In the meantime, focus on lifestyle changes and exercise, and keep an eye on your belt buckle to gauge your progress.”

CONCLUSION / ENDING STATEMENT

Thank you so much for reading to the end and taking this journey with me. I am confident by now that you feel empowered by this knowledge on overweight and obesity conditions, prevalence in the United States, the economic costs, clinical consequences, implications for national defense, and proposed solutions from the experts in public health. I truly believe that the first step in making measurable and meaningful change is to be aware and educated on all of the issues in order to develop a comprehensive and effective strategy to make the desired change or improvements. By sharing this body of knowledge here as well as my own views and perspectives on the matter, I aim to encourage others to be proponents of positive change regarding America’s health. And for those who are finding it challenging to reach your health goals, I wish you the very best and I hope some or all of this information and related resources will be of help to you. As a child, I overcame a stuttering condition, therefore I fully understand and appreciate the challenges of overcoming high hurdles. To those in leadership and

management positions whether it be at a university, company, government entity, etc., you have the power and ability to make change happen. I truly hope that you take all of the variables and facts into consideration and perhaps formulate your own plan for solving the weight problem at your organization. As Americans, we all depend on each other to continue to make this a strong, just, and opportunistic nation, whether you are a physician, engineer, truck driver, military member, teacher, or business owner, we all play our part in the overall U.S. economy and society. This problem affects us all in all of these sectors. If we can even make a little progress in solving the weight problem, it will make for improved performance and results in all of these areas, and when added up all together, from the Atlantic coast to the Pacific, this means a healthier and more productive nation.

SOURCES:

Economic Costs - Paying the Price for Those Extra Pounds

<https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/>

Health Care Employment as a Percent of Total Employment

<https://www.kff.org/other/state-indicator/health-care-employment-as-total/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>

Total Healthcare Costs – CMS

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical#:~:text=U.S.%20health%20care%20spending%20grew,spending%20accounted%20for%2017.7%20percent.>

Hip Replacement Cost

<https://health.costhelper.com/hip-replacement.html>

US MEDICAL HEALTH RESEARCH SPENDING ON THE RISE, BUT FOR HOW LONG?

<https://www.researchamerica.org/news-events/news/us-medical-health-research-spending-rise-how-long>

Investment in medical and health R&D not keeping up with needs of nation

https://www.eurekalert.org/pub_releases/2019-12/r-iim121719.php#:~:text=%2D%2DDecember%2018%2C%202019%20%2D%2D,rate%20of%20overall%20health%20spending.

Why Most Clinical Research Is Not Useful

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4915619/>

U.S. national health expenditure as percent of GDP from 1960 to 2020

<https://www.statista.com/statistics/184968/us-health-expenditure-as-percent-of-gdp-since-1960/>

Distribution of gross domestic product (GDP) across economic sectors in the United States from 2000 to 2018

<https://www.statista.com/statistics/270001/distribution-of-gross-domestic-product-gdp-across-economic-sectors-in-the-us/>

Adult Obesity Facts: Statistics on prevalence across states and regions

<https://www.cdc.gov/obesity/data/adult.html>

Childhood Obesity Facts: Obesity rates among children in the United States

<https://www.cdc.gov/obesity/data/childhood.html>

Bridging the Evidence Gap in Obesity Prevention: A Framework to Inform Decision Making.

<https://www.ncbi.nlm.nih.gov/books/NBK220174/>

Government initiatives to tackle the obesity epidemic – Nursing Times

<https://www.nursingtimes.net/clinical-archive/public-health-clinical-archive/government-initiatives-to-tackle-the-obesity-epidemic-27-09-2005/>

AMA adopts policy to help physicians, students prevent, manage obesity

<https://www.ama-assn.org/press-center/press-releases/ama-adopts-policy-help-physicians-students-prevent-manage-obesity>

Obesity Is Now A Disease, American Medical Association Decides

<https://www.medicalnewstoday.com/articles/262226#1>

Defining Adult Overweight & Obesity

<https://www.cdc.gov/obesity/adult/defining.html>

Medical Definition of Obese

<https://www.medicinenet.com/obese/definition.htm>

Body Mass Index Table

https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmi_tbl.htm

Clinical Definition of Obesity

<https://iapam.com/clinical-definition-obesity.html>

Healthline: Obesity Facts

<https://www.healthline.com/health/obesity-facts#1.-More-than-one-third-of-adults-in-the-United-States-are-obese>.

CDC: Obesity and Overweight Statistics

<https://www.cdc.gov/nchs/fastats/obesity-overweight.htm>

WHY ARE AMERICANS OBESE?

<https://www.publichealth.org/public-awareness/obesity/>

Institute for Health Metrics and Evaluation at the University of Washington

<http://www.healthdata.org/news-release/vast-majority-american-adults-are-overweight-or-obese-and-weight-growing-problem-among>

Over 73% of U.S. Adults Overweight or Obese | MedPage Today

<https://www.medpagetoday.com/primarycare/obesity/90142>

Obesity: 'Like the new smoking'

<https://www.latimes.com/health/la-xpm-2011-mar-07-la-he-cancer-obesity-20110307-story.html>

Obesity Prevention Source -Harvard School of Public Health

<https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/economic/>

Health Risks - Weight Problems Take a Hefty Toll on Body and Mind

<https://www.hsph.harvard.edu/obesity-prevention-source/obesity-consequences/health-effects/>

Weight: A Silent Heart Risk

<https://www.hopkinsmedicine.org/health/wellness-and-prevention/weight-a-silent-heart-risk>

Belly fat linked with higher heart disease risk

<https://www.health.harvard.edu/blog/belly-fat-linked-with-higher-heart-disease-risk-2018072614354>

The High and Rising Costs of Obesity to the US Health Care System

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5359159/>

America's Obesity Crisis: The Health and Economic Costs of Excess Weight - Milken Institute

<https://milkeninstitute.org/report/americas-obesity-crisis-health-and-economic-costs-excess-weight>

Obesity and the Rising Cost of Healthcare in America

<https://fairfoodnetwork.org/from-the-field/obesity-and-the-rising-cost-of-healthcare-in-america/>

Obesity Costs the Average U.S. Adult Almost \$1,900 per Year: Study

<https://www.usnews.com/news/health-news/articles/2021-03-24/obesity-costs-the-average-us-adult-almost-1-900-per-year-study>

Obesity drives U.S. health care costs up by 29 percent, varies by state

<https://www.sciencedaily.com/releases/2018/02/180208180356.htm>

MAYO CLINIC – OBESITY

<https://www.mayoclinic.org/diseases-conditions/obesity/symptoms-causes/syc-20375742>

America's obesity is threatening national security, according to this study

<https://www.armytimes.com/news/your-army/2018/10/10/americas-obesity-is-threatening-national-security-according-to-this-study/>

UNFIT TO SERVE – CENTERS FOR DISEASE CONTROL

<https://www.cdc.gov/physicalactivity/downloads/unfit-to-serve.pdf>

Community Efforts – CENTERS FOR DISEASE CONTROL

<https://www.cdc.gov/obesity/strategies/community.html>

Steps to Wellness: A Guide to Implementing the 2008 Physical Activity Guidelines for Americans in the Workplace

<https://www.cdc.gov/physicalactivity/worksites-pa/toolkits/pa-toolkit.htm>

Strategies to Prevent & Manage Obesity

<https://www.cdc.gov/obesity/strategies/index.html>

BOOK: Progress in Preventing Childhood Obesity - How Do We Measure Up? (2007)

<https://www.nap.edu/catalog/11722/progress-in-preventing-childhood-obesity-how-do-we-measure-up>