Increasing Life Expectancy in the U.S.:

Physical Health Tactics to Improve Health and Prevent Chronic Disease

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Writing for the Health Professions

Abstract

Despite several initiatives to improve life expectancy in the U.S., Americans are dying earlier than their counterparts in other developed countries. This review document discusses life expectancy in the U.S. and how it compares to other comparable countries and death rates related to the leading causes of death. It provides an explanation as to why more Americans are dying earlier due to worsening health conditions. The document describes clear, simple treatment and prevention techniques. The document cites public health awareness, health education, physical exams, and specific dietary recommendations as keys to improve physical health, decrease chronic disease and related deaths, and to increase life expectancy in the U.S.

Introduction

The Organization for Economic Co-operation and Development (OECD) (2013) states that life expectancy has increased greatly for several developed countries since 1970. “For the first time in history, in 2011, life expectancy on average across OECD countries exceeded 80 years, an increase of ten years since 1970” (OECD, 2013). However, life expectancy in the U.S. is declining for the first time since 1993 (Bernie, 2016). In 1970, life expectancy in the U.S. was one year *above* the OECD average (80.1 years), but now it is more than one year *below* the average. Life expectancy among the top-ranking nations (i.e., Switzerland, Japan, Italy, and two-thirds of all OECD countries) was above 80 years in 2011 (Figure 1). The OECD reports that life expectancy in the U.S. ranks 26th out of 32 member countries. Life expectancy in Switzerland was 82.8 years and 81.1 years in the United Kingdom; yet, life expectancy in the U.S. was only at 78.7 years in 2011 (OECD, 2013). This decline is significant, because it affects all Americans regardless of their age, sex, race, or ethnicity.

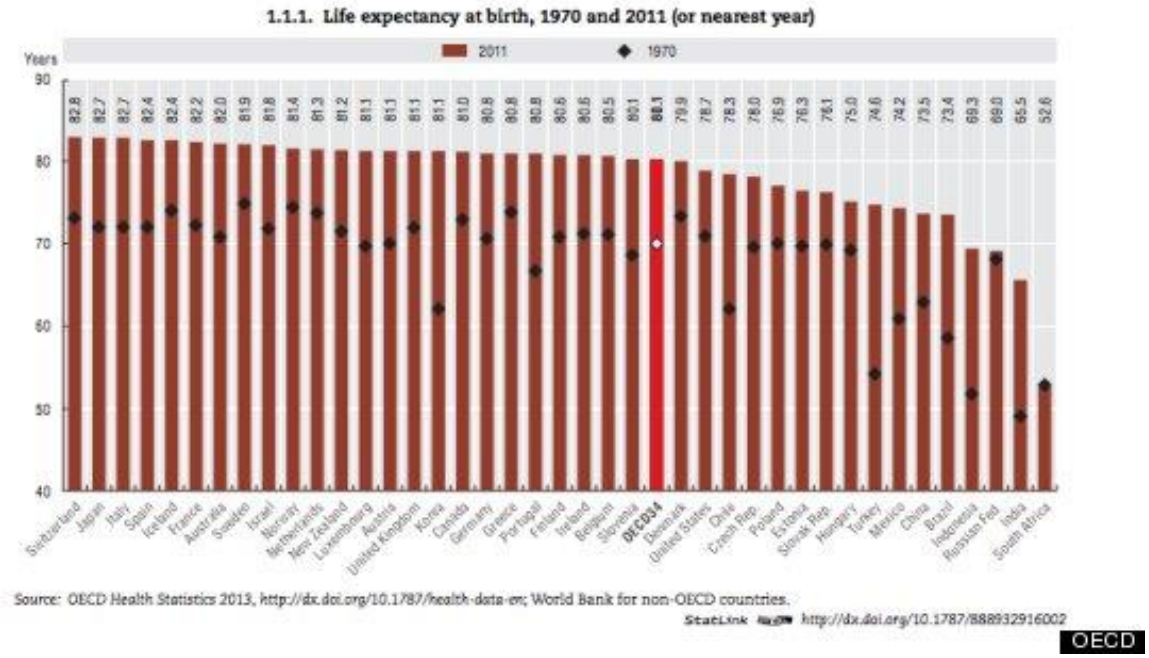

Figure 1. Life expectancy at birth, 1970 and 2011 for OECD countries (OECD, 2013).

Disturbingly, Americans are dying earlier than their counterparts from other developed nations due to worsening health conditions (chronic disease and illness) (Bernie, 2016). Other Western countries continue to surge upwards in terms of life expectancy, but the U.S. is falling behind. For most leading causes of death, mortality rates are higher in the U.S. than in comparable countries (Figure 2). In 2010, age-adjusted major causes of mortality per 100,000 population were higher in the U.S. for diseases of the circulatory, respiratory, and nervous system; external causes; mental and behavioral disorders; and endocrine, nutritional, and metabolic diseases (OECD, 2013).

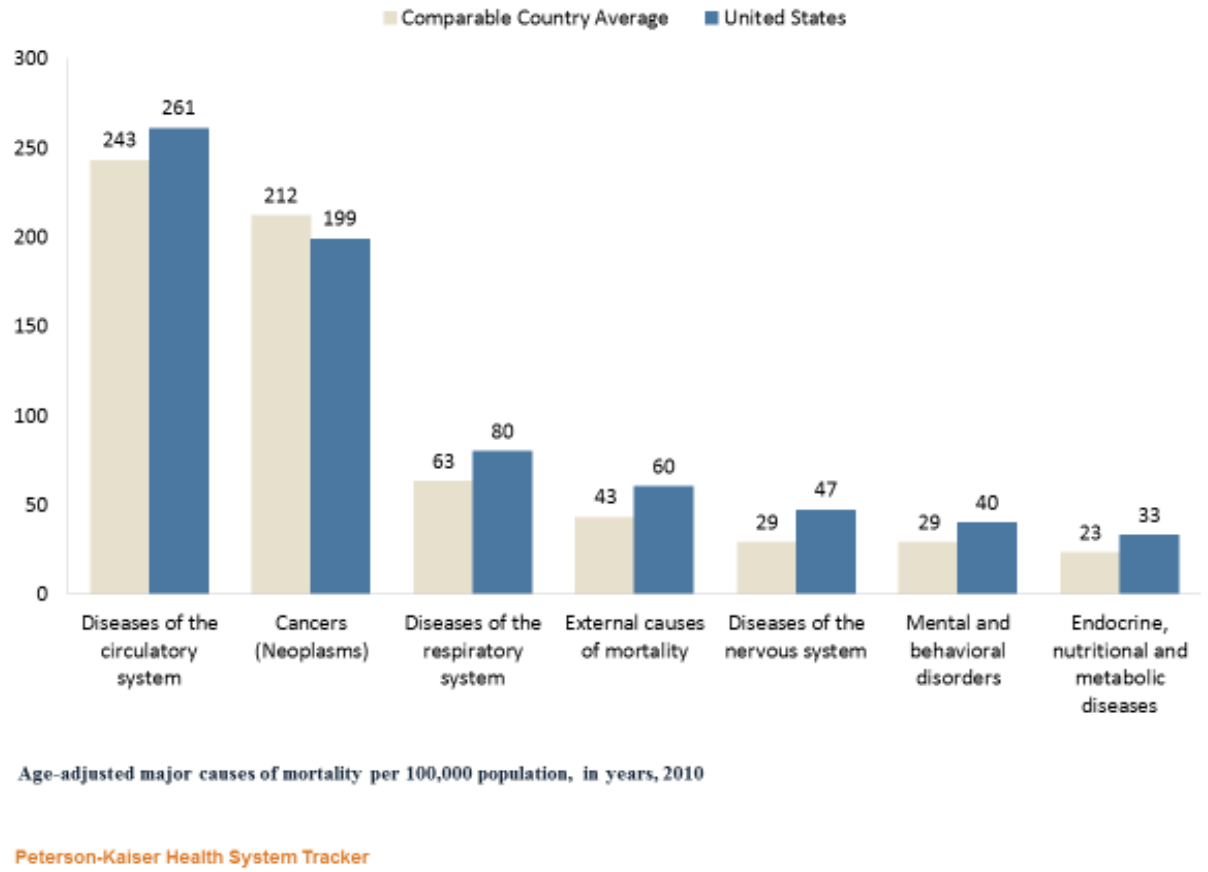

Figure 2. Age-adjusted major causes of mortality per 100,000 population, in years, 2010, for the U.S. and comparable countries (OECD, 2013).

Life Expectancy in the U.S.

Life expectancy at birth in the U.S. for the total population was 78.8 years in 2015, a significant decrease of 0.1 years from 2014 (Figure 3). Life expectancy for males decreased 0.2 years (76.5 to 76.3), a larger decrease than for women [0.1 years (81.3 to 81.2)]. Decreased life expectancy rates are not linked to the 2015 infant mortality rate, which increased only slightly from 2014 (Xu, Murphy, Kochanek, & Arias, 2016). Also, life expectancy at age 65 remained unchanged for the total population, men, and women, which suggests that the reasons for decreased life expectancy relate to middle-aged or younger individuals (Bernie, 2016; Xu et al., 2016).

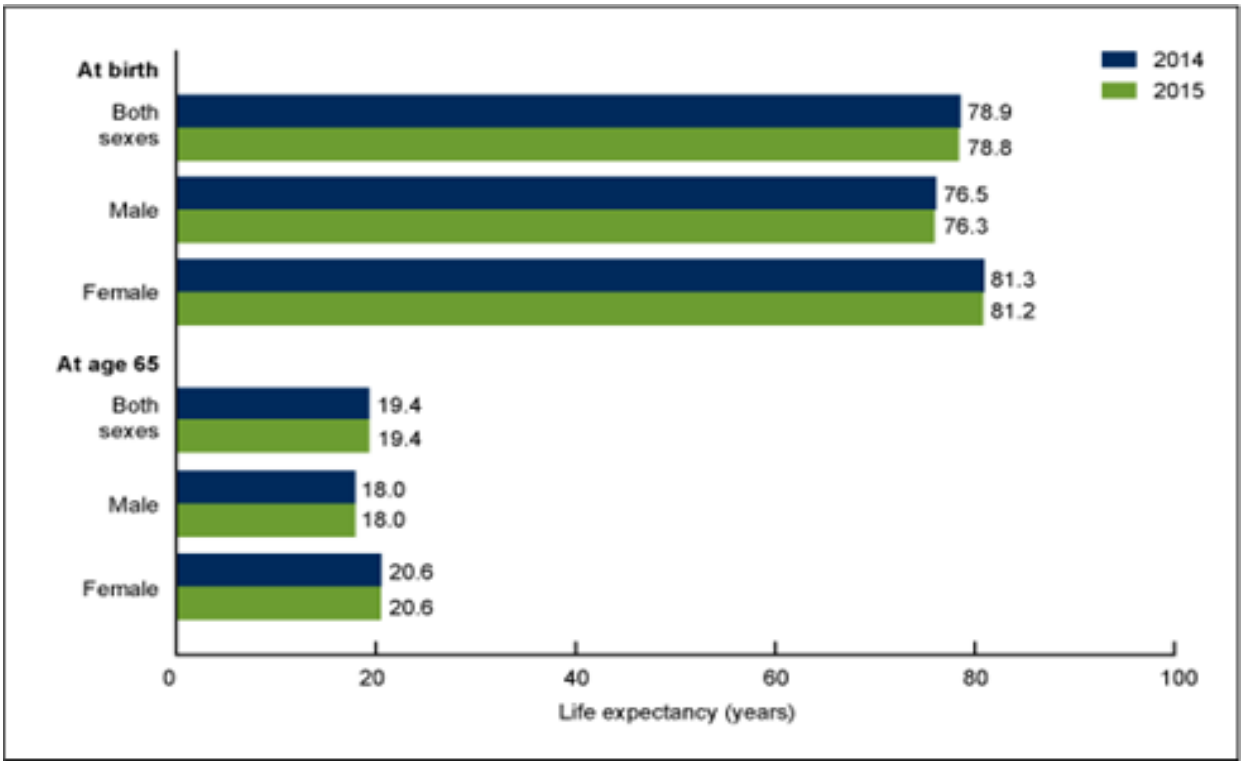

Figure 3. U.S. life expectancy at selected ages, by sex, 2014 and 2015 (Xu et al., 2016).

Increased life expectancy seems to be related to increased death rates, independent of infant mortality death rates. From 2014 to 2015, the age-adjusted death rate for the total U.S. population increased 1.2% (Xu et al., 2016) (Figure 4). Life expectancy is decreasing for nearly all groups. Age-adjusted death rates increased for most groups including non-Hispanic black males (0.9%), non-Hispanic white males (1.0%), and non-Hispanic white females (1.6%) but remained nearly unchanged for non-Hispanic black females. Hispanic male and female age-adjusted death rates also increased (Xu et al., 2016). The differences seem small, but they are indicators of disturbing trends of Americans' worsening health and related deaths.

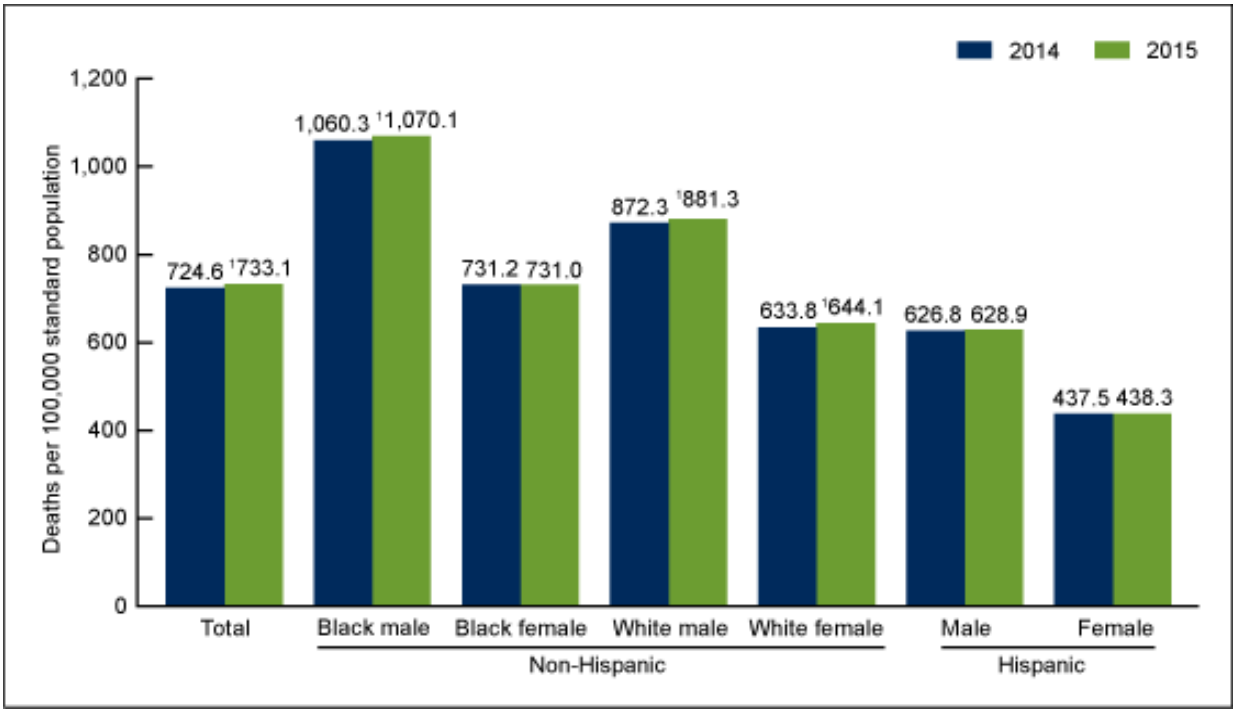

Figure 4. [1]Statistically significant increase in age-adjusted death rate from 2014 to 2015 ($p < 0.05$) (Xu et al., 2016).

The Role of Worsening Health in Decreasing Life Expectancy

More Americans are Suffering Worsening Health

The Centers for Disease Control and Prevention (CDC) reports that in 2005, 133 million Americans (1 in 2 adults) had at least one chronic illness (CDC, 2009), and more recently, the U.S. Department of Health and Human Services (HSS) and U.S. Department of Agriculture (USDA) (2015) state that these preventable chronic diseases are directly related to poor eating habits. Rates of chronic diet-related diseases continue to rise and come with increased health risks including early death (HSS, 2015). In 2003, nearly 37% of adults reported having two or more risk factors for the two leading causes of death (heart disease and stroke) including high blood pressure, high cholesterol, diabetes, current smoking, physical inactivity, and obesity (CDC, 2009). Additionally, health disparities in chronic disease (i.e., heart disease and cancer) incidence and mortality are higher among minority racial and ethnic populations (especially African and Hispanic Americans) (CDC, 2009).

More Americans are Dying Earlier

Increasing death rates from worsening health contribute to the low and decreased life expectancy in the U.S. (Bernie, 2016). The National Center for Health Statistics found that lower life expectancy is due to increasing fatalities from heart disease, stroke, diabetes, drug overdoses, accidents and other conditions (Bernie, 2016; Xu et al., 2016). The CDC reports that 7 out of 10 deaths among Americans annually are from chronic illness (CDC, 2009, 2013). Significantly, rates of death due to the leading causes of death increased (Bernie, 2016; Xu et al., 2016). Of the 10 leading causes of death (heart disease, cancer, chronic lower respiratory diseases, unintentional injuries, stroke, Alzheimer's disease, diabetes, influenza and pneumonia, kidney

disease, and suicide), all but cancer increased from 2014 to 2015 (Figure 5) (Xu et al., 2016). Heart disease and stroke are 2 leading causes of death in the U.S. (CDC, 2009; U.S. Preventive Services Task Force [USPSTF], 2014).

Age-adjusted death rates increased for eight leading causes (heart disease, chronic lower respiratory diseases, unintentional injuries, stroke, Alzheimer's disease, diabetes, kidney disease, and suicide) and decreased for one (cancer). The 10 leading causes accounted for 74.2% of all deaths in 2015 (Xu et al., 2016). Increased death rates, due to an increase in the leading causes of death, contribute to the low and decreasing life expectancy in the U.S. Many of these chronic disease-related deaths are preventable (HSS, 2015).

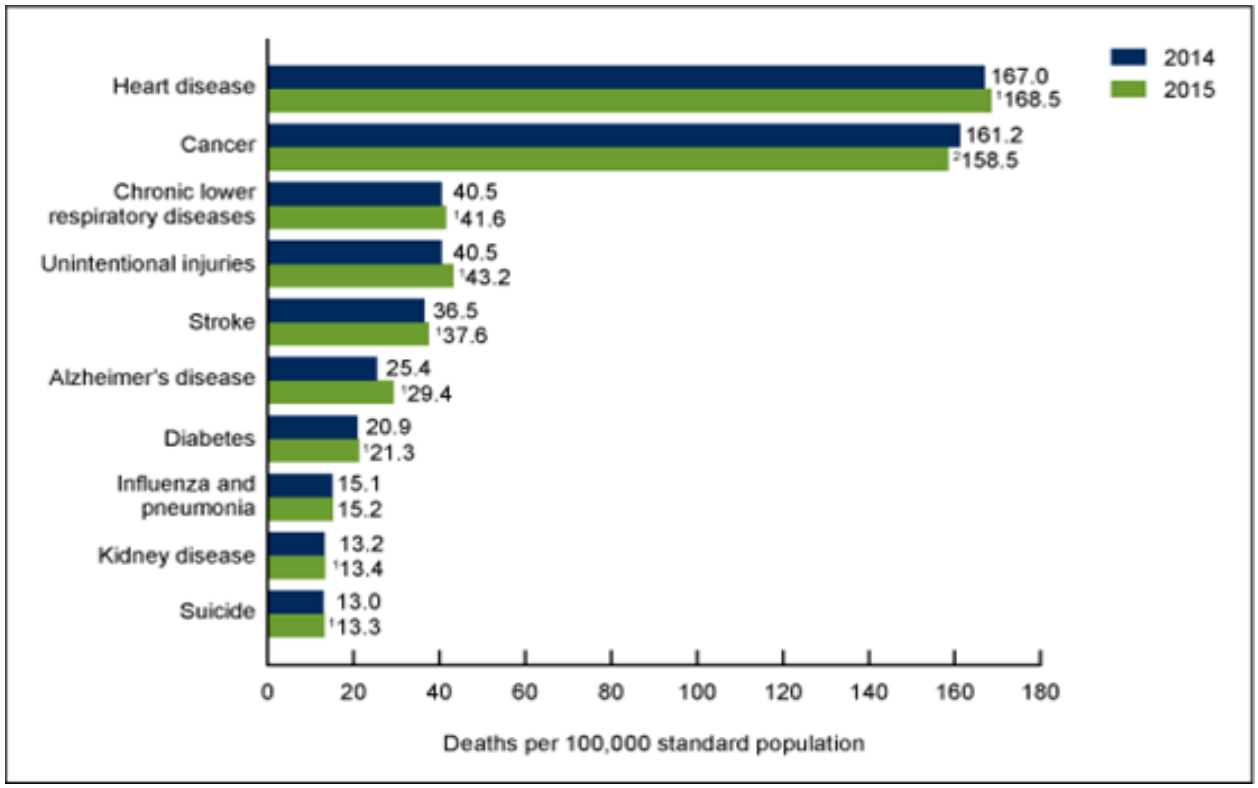

Figure 5. Age-adjusted death rates for the 10 leading causes of death in 2015: United States, 2014 and 2015. [1]Statistically significant increase in age-adjusted death rate from 2014 to 2015 ($p < 0.05$). [2]Statistically significant decrease in age-adjusted death rate from 2014 to 2015 ($p < 0.05$) (Xu et al., 2016).

Treatment and Prevention

Awareness, Education, Physical Exams, and Healthy Diet

Chronic diseases are among the most common yet most preventable health issues plaguing Americans; yet, they are on the rise in the U.S. (CDC, 2009; HSS, 2015). Optimal physical health, decreased incidence of chronic disease and related deaths, and increased life expectancy in the U.S. can be achieved through public health awareness, education, physical exams, and - more specifically - by adhering to a healthy diet as outlined in the *2015-2020 Dietary Guidelines for Americans (Dietary Guidelines)* (HSS, 2015).

Chronic Disease Prevention

Chronic disease can be prevented by:

- ✓ **Being informed**
- ✓ **Receiving education**
- ✓ **Getting regular physical exams**
- ✓ **Eating a healthy diet**

Public health awareness

The public must take responsibility for and understand their unique, individual physical health and nutrition needs; recognize the signs of chronic illness and disease to reverse and prevent future disease; and understand how and where to access resources for living in optimal health. Policies and programs can empower people to make healthier choices by providing access to actionable and easy-to-understand information and resources (CDC, 2013).

Health education

Healthcare policymakers and programs, in conjunction with healthcare professionals, can provide tools to empower the public to make healthier choices by raising awareness and improving health education efforts. Also, healthcare professionals can eliminate health

disparities by training and hiring more qualified staff in efforts toward improving all Americans' health and increasing life expectancy (CDC, 2013). Healthcare professionals can use a variety of communication tools (i.e., mobile phone applications, personal health records, and credible health websites) and culturally competent methods to support more traditional written and oral communication (CDC, 2013). Successful communication tools like the CDC Mobile App provide iPhone and Android users with timely, vital healthcare information (CDC, 2016).

CDC Mobile App

The CDC Mobile App for iOS, Android, and Windows 8 devices allows 24/7 access to timely, vital healthcare information, anywhere, anytime.

Users can enjoy a wide variety of stories, videos, podcasts, journals, and blogs.

Automatic updates ensure users get the most up-to-date healthcare news and information.

Direct links to social media, text, and email allow users to share the most interesting articles with family and friends.

The CDC Mobile App is available for download on iTunes and Google Play.

Physical Exams

Healthcare professionals can aid the public by encouraging and implementing physical exams, diagnostics, and tests that identify physiological and nutritional imbalances/deficiencies to identify chronic diseases in their early stages or to prevent them completely in early life stages. Early detection through annual physical exams and appropriate screenings can greatly reduce chronic disease and related deaths (CDC, 2009). Preventative care such as immunizations, cancer screenings, and diabetes prevention programs are vital to better overall health, reduced incidence of chronic disease, and prevention of early death (CDC, 2013). Also, healthcare professionals can provide detailed dietary guidelines, based on solid medical data, tailored to each person's physical nutritional needs to improve overall health and wellness and increase life expectancy.

Healthy Diet

A large body of scientific evidence shows that most chronic diseases are related to poor eating patterns (HSS, 2015). A person's eating patterns represents the totality of what they eat and drink over time and how dietary components work together in relation to their health and the prevention of chronic disease. Healthy eating patterns promote a healthy body weight and can prevent and reduce the risk of chronic disease throughout periods of growth, development, aging, and pregnancy (HSS, 2015).

Diet, body weight, and chronic disease are closely related; therefore, practicing healthy eating patterns maintains healthy body weight, which reduces the incidence of many chronic diseases, including leading causes of death. The CDC reports that obesity increases the risk for many serious chronic diseases including coronary heart disease, hypertension, stroke, type 2 diabetes, certain types of cancer, and premature death (CDC, 2010). Individuals who are at a healthy weight are less likely to develop chronic disease risk factors, develop chronic diseases, and to die at an earlier age (ODPHP, 2017).

Maintaining good nutrition can help lower the risk for many chronic diseases including the leading causes of death (CDC, 2009, HSS, 2015). The HSS and USDA devised the *Dietary Guidelines* (Figure 5), available at https://health.gov/dietaryguidelines/2015/guidelines/, based on the latest scientific evidence.

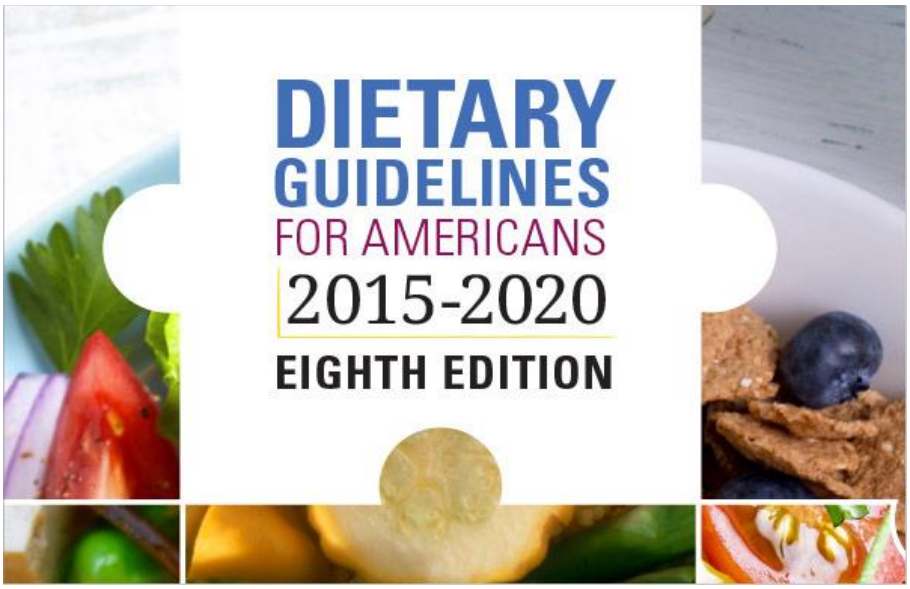

Figure 5. *2015-2020 Dietary Guidelines for Americans* (ODPHP, 2017).

The publication links nutrition, health, chronic disease, and related deaths and is an essential resource for health professionals and policymakers. The guide provides recommendations for choosing a healthy diet, with a focus on preventing diet-related chronic disease. Their goal is to help Americans ages two and older to improve and maintain health, prevent chronic disease, and to live longer lives.

The *Dietary Guidelines* recommends the following ways for Americans to adopt healthier eating habits (CDC, 2016; HSS and USDA, 2015):

1. **Maintain a healthy diet for life.**
2. **Focus on variety, nutrient density, and amount of food.**
3. **Limit calories from added sugar and saturated fats and reduce sodium intake.**
4. **Shift to healthier food and beverage choices.**
5. **Support healthy eating patterns for everyone.**

Americans should adhere to the following quantitative recommendations:

1. **Consume less than 10% of daily calories from added sugars.**
2. **Consume less than 10% of daily calories from saturated fats.**
3. **Consume less than 2300 milligrams (mg) of sodium daily.**
4. **Consume alcohol in moderation - one drink daily for women, two drinks daily for men.**

Dietary Guidelines

Americans should adopt the following healthy eating habits to maintain health, prevent chronic disease, and live longer:

1) Maintain a healthy diet for life by choosing foods and beverages within an appropriate calorie level to achieve and maintain healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.

2) Focus on variety, nutrient density, and amount of food across all food groups. Nutrient dense foods and beverages provide vitamins, minerals, and other substances that contribute to positive health effects.

3) Limit calories from added sugar and saturated fats and reduce sodium intake. No more than 10% of daily calories should come from added sugars, and no more than 10% of daily calories should come from saturated fats. Consume less than 2300 milligrams (mg) of sodium daily.

4) Make healthier food and beverage choices in place of unhealthy alternatives such as junk food, fast food, and other empty calories. Alcohol should be consumed in moderation – no more than one drink daily for women and two drinks daily for men.

5) Support healthy eating habits for everyone in all settings nationwide (i.e., school, work, communities).

State of the Art Advancements

Leading Causes of Death

Heart disease and stroke

Since 1999, death rates for coronary disease have declined - heart disease by 20.8% and stroke by 24.4%. Since the 1960s, the percentage of adults with high cholesterol (a major risk factor for heart disease) has been reduced by half (CDC, 2009). However, the CDC estimates that nearly half of all U.S. adults ages 20 and older have at least one of the following CVD risk factors: uncontrolled hypertension, uncontrolled elevated low-density lipoprotein (LDL) cholesterol level, or current smoking (USPSTF, 2014).

Strong evidence shows that healthy eating patterns are associated with reduced cardiovascular disease (CVD) (HSS, 2015). Research indicates that consuming a diet rich in fruits and vegetables, whole grains, and seafood rich in long-chain omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) (i.e., salmon, anchovies, herring, shad, sardines, Pacific oysters, trout, and Atlantic and Pacific mackerel) is associated with a reduced risk of CVD and associated deaths (HSS, 2015). Strong evidence suggests that eating patterns that include lower intake of meats (including processed meats and poultry) and added sugars are associated with reduced risk of CVD in adults (HSS and USDA, 2015). Strong and consistent evidence indicates that replacing saturated fats with unsaturated fats (especially polyunsaturated fats) is associated with reduced risk of CVD events (heart attacks) and CVD-related deaths (HSS, 2015). Some evidence shows that replacing saturated fats with plant sources of monounsaturated fats (i.e., olive oil and nuts) may be associated with reduced risk of CVD (HSS, 2015). Studies also show a link between increased intake of trans fats, which raises LDL-

cholesterol, and increased risk of CVD; therefore, it should be limited as much as possible (HSS, 2015).

Cancer

In the last two decades, great progress has been made in cancer prevention strategies, early detection, interventions, and cancer treatments. Screening for breast cancer has decreased deaths by 2% per year from 1998-2005, and colorectal cancer deaths have decreased for both men and women by 4% (CDC, 2009). Moderate evidence indicates that healthy eating patterns, including a diet rich in fruits and vegetables and lower intake of meats (including processed meats and poultry) and added sugars, are associated with a reduced risk of certain types of cancers (HSS, 2015).

Diabetes

Higher percentages of people with diabetes are monitoring their blood sugar daily, receiving annual foot exams and eye exams, and influenza and pneumococcal vaccinations. Incidence for treatment for diabetes-related end-stage renal disease declined from 21% to 18% from 1997-2005 (CDC, 2009). Moderate evidence indicates that eating patterns that include lower intake of meats (including processed meats and poultry) and added sugars are associated with reduced risk of type 2 diabetes (HSS, 2015).

Dietary Guidelines

More Americans (children, adolescents, adults, and senior adults) than ever before have one or more preventable diet-related chronic health condition due to a history of poor eating patterns, which accounts for today's focus on healthy diet. Presently, about ¾ of all Americans has an

eating pattern low in fruits, vegetables, dairy, and oils; more than half are not meeting the recommendations for the subgroups within total grain and total protein foods; and most exceed the recommendations for added sugars, saturated fats, and sodium (HSS, 2015). Eating too much added sugar (not naturally occurring in fruit or milk) can lead to health problems such as weight gain and obesity, type 2 diabetes, and heart disease (CDC, 2016).

Since 1980, a new edition of the *Dietary Guidelines for Americans* has been published every five years. Although consistent over time, the *Dietary Guidelines* has been updated as sound food-based scientific knowledge has evolved to provide a greater understanding of, and focus on, the importance of healthy eating patterns in relation to overall health, prevention and management of chronic disease, and related deaths (HSS, 2015). The Federal Dietary Guidelines Advisory Committee (Advisory Committee) used national data from Federal agencies considering chronic disease prevalence rates and the correlation between food and nutrient intakes in the U.S. across age, sex, and other demographic characteristics, and nutrient content of food. The Advisory Committee made recommendations based on that data and food pattern modeling analysis to estimate the effect on diet quality of possible changes in the types and amounts of foods to recommend the USDA Food Patterns within the *Dietary Guidelines* (HSS, 2015).

The *Dietary Guidelines* are intended to, and should be, used by policymakers and nutrition and health professionals to inform the public on ways to make healthy choices in their daily lives by adapting healthy eating patterns to help prevent chronic disease and related deaths. The *Dietary Guidelines* also informs USDA and HSS food programs (USDA's National School Lunch Program and School Breakfast Program), the Supplemental Nutrition Program for Women, Infants, and Children, and the Administration on Aging (HSS, 2015).

Conclusions and Recommendations

Americans need to become more aware and better informed about their personal health including how to identify the signs of, prevent, and reverse chronic disease and related deaths. Healthcare professionals must remain vigilant in their attempts to educate and inform the public, encourage annual physical exams, screenings, and other pertinent diagnostics. Policymakers and healthcare professionals should adhere to the *Dietary Guidelines for Americans* to encourage healthy eating patterns, promote health, prevent and manage chronic illness, and increase life expectancy in the U.S. Americans need to make shifts in their current eating patterns to better reflect key recommendations outlined in the *Dietary Guidelines*. They should follow healthy eating patterns across their lifespan; focus on variety, nutrient density, and amount of food; limit calories from added sugars and saturated fats and reduce sodium intake; make healthier nutrient-dense food choices over less healthy alternatives; and support healthy eating patterns in multiple environments to ensure health and longevity for everyone (HSS, 2015). Policymakers and healthcare professionals should use the *Dietary Guidelines* to encourage Americans to make the following shifts in their current eating patterns to promote health, reduce chronic disease, and increase life expectancy:

1. **Consume more vegetables**
2. **Consume more whole, nutrient-dense fruits**
3. **Consume more whole grains**
4. **Consume more fat-free or low-fat forms of dairy**
5. **Increase variety in protein food choices**
6. **Use healthy oils**
7. **Limit amount of added sugar**
8. **Reduce intake of foods high in saturated fats**
9. **Reduce sodium intake**

Healthy Eating Tips

Americans should make the following changes to their diets to promote health, reduce chronic disease, and increase life expectancy:

1) Consume **more vegetables in all subgroups** (dark-green, red and orange, legumes (beans and peas), starchy vegetables (potatoes, corn) and other vegetables (cruciferous et. al.) in place of refined grains or meats high in saturated fat and/or sodium.

2) Consume more whole, nutrient-dense fruits in place of foods with added sugar (cakes, pies, ice cream, and candy).

3) Consume more grains, at least 50% of which should be whole grains (whole-wheat breads, rolls, bagels, and crackers; oatmeal; whole-grain ready-to-eat cereals; popcorn; brown rice; and whole-grain pasta in place of refined grains.

4) Consume more fat-free or low-fat dairy (milk, cheese, yogurt) in place of high-fat whole milk and regular cheese.

5) Increase variety in protein choices to more nutrient-dense choices including lean and lower sodium options; substitute seafood for meat, poultry, and eggs at least twice a week; and use legumes, nuts, and seeds in mixed dishes in place of some meat or poultry.

6) Use healthy oils such as extra-virgin olive oil, coconut oil, and canola oil instead of solid fats (butter, stick margarine, shortening, lard) in food preparation, and increase intake of foods naturally containing healthy oils (seafood and nuts) in place of some meat and poultry.

7) Limit amount of added sugar to less than 10% of calories per day by choosing beverages with no added sugars (plain water, low-fat or fat-free milk, or 100% fruit or vegetable juice low in added sugar) and unsweetened or no-sugar-added versions of canned fruit, fruit sauces, and yogurt in place of sugary grain-based and dairy desserts.

8) Reduce intake of foods high in saturated fats to those high in polyunsaturated and monounsaturated fats by choosing lower-fat forms of foods and beverages containing solid fats (e.g., fat-free or low-fat milk instead of whole or 2% milk, low-fat cheese instead of regular cheese, lean rather than fatty cuts of meat); consuming smaller portions of foods containing saturated fats or consuming them less often; and replacing some fatty meats or regular cheese with vegetables, whole grains, lean meats, and low-fat cheese.

9) Reduce sodium intake by choosing low-sodium, reduced-sodium or no-salt-added versions of foods; choosing fresh, frozen vegetables, poultry, seafood, pork, and lean meat rather than processed meat and poultry; cooking from scratch; limiting sauces, mixes, and "instant" products, and flavoring foods with natural herbs and spices instead of salt.

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APPENDIX 1

Problem Statement:

Despite several initiatives to improve life expectancy in the U.S., Americans are dying earlier than their counterparts in other developed countries. This review document will describe clear, simple goals including initiatives for healthy diet and balanced daily input/output practices for adults and children to improve overall health; prevent chronic disease; decrease death rates; and increase life expectancy.

APPENDIX 2

Concept Outline:

- **Introduction**: background of dropping life expectancy in the U.S. and related factors. This review document will present suggestions for improving the everyday quality of life by varied physical health practices, resulting in better general health and wellness for increased life expectancy among Americans.
- **Epidemiology**
    - Life expectancy in the U.S. is lower and decreasing for first time since 1993.
        - Rate for total population at birth: 78.8 years in 2015, a significant decrease of 0.1% since 2014.
        - Rates are not linked to infant mortality rate.
        - Rates remain the same for age 65 for total population.
        - Reasons occur in middle age or younger.
    - Decline affects all Americans regardless of age, sex, race, or ethnicity.
        - Males: 76.3 years in 2015, a decrease of 0.2 years since 2014.
        - Females: 81.2 years in 2015, a decrease of 0.1 years since 2014.
        - Age-adjusted death rates increased for most groups including non-Hispanic black males, non-Hispanic white males, and non-Hispanic white females, Hispanic males and females.
    - Americans are dying earlier than their foreign counterparts.
        - Lower rates linked to worsening health conditions in U.S.
            - Increase in chronic health conditions
                - In 2003, nearly 37% of adults reported having two or more risk factors for heart disease and stroke (high blood pressure, high cholesterol, diabetes, current smoking, physical inactivity, and obesity).
            - 7 of 10 Americans die from chronic diseases annually.
            - 1 in 2 adults (133M) had at least one chronic disease in 2005.
            - Racial/ethnic minority populations are more prone to chronic disease and related mortality.
                - In 2005, age-adjusted stroke death rates were 31% higher for African Americans than for whites.
                - Age-adjusted heart disease death rates were 23% higher.
                - More African Americans are likely to die from cancer.
        - Lower rates linked to increased death rates in U.S.
            - Increasing fatalities of death from heart disease, stroke, diabetes, drug overdoses, accidents and other conditions.

        - Increases in leading causes of death between 2014-2015 include heart disease, chronic lower respiratory diseases, unintentional injuries, stroke, Alzheimer's disease, diabetes, influenza and pneumonia, kidney disease, and suicide.
            - Heart disease and stroke are 1st and 3rd leading causes of death accounting for over 30% of all mortality.
            - Cancer claims 1 million lives annually as second leading cause of death.
- **Physical Health Via Healthy Diet (physical exams, habits, consumption)**
    - Optimal physical health, decreased chronic disease and, subsequently, increased life expectancy occurs by taking achievable preventative steps toward preventing disease before it begins. This can be achieved by:
- **Treatment and Prevention (Health awareness, education, and physical exams).**
    - Health Awareness
        - Public must recognize the signs of chronic illness and disease, reverse them, and prevent future disease through eating a healthy diet to decrease the causes of death and increase life expectancy in the U.S.
        - Public must understand how and where to access resources for living in optimal health, decreasing chronic disease and leading causes of death.
        - Public must understand their unique, individual physical health and nutrition needs to empower themselves to live healthier, longer lives.
    - Education
        - Healthcare policymakers and programs, in conjunction with healthcare professionals, can provide tools to empower the public to make healthier choices by raising awareness and improving health education efforts.
        - Healthcare professionals can eliminate health disparities by training and hiring more qualified staff in efforts toward improving all Americans' health and increasing life expectancy.
    - Physical Exams
        - Healthcare professionals can aid the public by encouraging and implementing physical exams, diagnostics, and tests that identify physiological and nutritional imbalances/deficiencies to identify chronic diseases in their early stages or to prevent them completely in early life stages.
        - Healthcare professionals can provide detailed dietary guidelines, based on solid medical data, tailored to each person's physical nutritional needs to improve overall health and wellness and increase life expectancy.

- Healthy Diet
  - Scientific evidence shows most chronic disease is linked to poor diet.
  - Healthy eating patterns promote healthy body weight and prevent the risk of chronic disease through all stages of life.
    - Maintaining a healthy weight body weight reduces risk for obesity which is linked to chronic disease such as coronary heart disease, hypertension, stroke, type 2 diabetes, certain cancers, and early death.

- **State of the Art Advancements**
  - Leading Causes of Death
    - Heart Disease and Stroke
      - Since 1999, death rates for coronary disease and stroke have declined 20.8% and 24.4%, respectively.
      - Since 1960s, percentage of adults with high cholesterol (major risk factor for heart disease) has been reduced by half.
    - Cancer
      - In the last two decades, great progress has been made in cancer prevention strategies, early detection, interventions, and cancer treatments.
      - Screening for breast cancer has decreased deaths by 2% per year from 1998-2005.
      - Colorectal cancer deaths decreased for both men and women by 4% from 1995-2005.
    - Diabetes
      - Higher percentages of people with diabetes are monitoring their blood sugar daily, receiving annual foot exams, eye exams, and influenza and pneumococcal vaccinations.
      - Incidence for treatment for diabetes-related end-stage renal disease declined from 21% to 18% from 1997-2005.
  - Dietary Guidelines
    - Most Americans have poor eating patterns.
      - ¾ of Americans has an eating pattern low in fruits, vegetables, dairy, and oils.
      - ½ of Americans are not eating enough total grain and total protein foods.
      - Most Americans eat too much added sugar, saturated fats, and sodium.
      - Poor eating habits lead to health problems like weight gain, obesity, type 2 diabetes, and heart disease.
    - The Dietary Guidelines for Americans guides healthy eating patterns.
      - New edition published every 5 years based on food-based science.
      - Focuses on healthy eating patterns in relation to overall health, prevention and management of chronic disease, and related deaths.

        - The Dietary Guidelines are meant for policymakers and nutrition and health professionals to inform the public on ways to adapt healthier eating patterns to prevent chronic disease.
- **Conclusions and Recommendations**
    - Habits (output):
        - Americans need to be informed on how to prevent and reverse chronic disease and related deaths.
        - Healthcare professionals must educate the public, encourage physical exams, screenings, and other tests.
        - Policymakers and healthcare professionals should adhere to the Dietary Guidelines to promote health, prevent chronic illness, and increase life expectancy.
        - Public should follow tailored dietary guidelines provided to them through their healthcare practitioner.
        - Public must eat a healthy diet from birth through all life stages will improve overall health, decrease chronic illness and the leading causes of death, and – ultimately - increase life expectancy.
        - Healthy dietary/nutritional habits promote physical health and wellness when followed every day.
    - Consumption (input):
        - Eating a healthy, nutritionally balanced diet beginning at birth and continuing throughout all stages of life prevents chronic illness and disease which leads to better health and, ultimately, increased life expectancy.
            - Guidelines suggest eating healthy for life; focus on variety, nutrient density, and amount of food; reduce intake of added sugars, saturated fats, and sodium; choose healthier food alternatives; and support health eating patterns in multiple environments.
            - Americans should eat more fruits, vegetables, whole grains, fat-free or low-fat dairy, more lean protein, and use healthy oils.

APPENDIX 3

Preventive Guidelines:

1) Maintain a healthy diet for life by choosing foods and beverages within an appropriate calorie level to achieve and maintain healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.

2) Focus on variety, nutrient density, and amount of food across all food groups. Nutrient dense foods and beverages provide vitamins, minerals, and other substances that contribute to positive health effects.

3) Make healthier food and beverage choices in place of unhealthy alternatives such as junk food, fast food, and other empty calories. Alcohol should be consumed in moderation – no more than one drink daily for women and two drinks daily for men.

4) Support healthy eating habits for everyone in all settings nationwide (i.e., school, work, communities).

5) Consume more vegetables in all subgroups (dark-green, red and orange, legumes (beans and peas), starchy vegetables (potatoes, corn) and other vegetables (cruciferous et. al.) in place of refined grains or meats high in saturated fat and/or sodium.

6) Consume more whole, nutrient-dense fruits in place of foods with added sugar (cakes, pies, ice cream, and candy).

7) Consume more grains, at least 50% of which should be whole grains (whole-wheat breads, rolls, bagels, and crackers; oatmeal; whole-grain ready-to-eat cereals; popcorn; brown rice; and whole-grain pasta in place of refined grains.

8) Consume more fat-free or low-fat dairy (milk, cheese, yogurt) in place of high-fat whole milk and regular cheese.

9) Increase variety in protein choices to more nutrient-dense choices including lean and lower sodium options and substituting seafood for meat, poultry, and eggs at least twice a week, and use legumes, nuts, and seeds in mixed dishes in place of some meat or poultry.

10) Use healthy oils such as extra-virgin olive oil, coconut oil, and canola oil instead of solid fats (butter, stick margarine, shortening, lard) in food preparation and increase intake of foods naturally containing healthy oils (seafood and nuts) in place of some meat and poultry.

11) Limit amount of added sugar to less than 10% of calories per day by choosing beverages with no added sugars (plain water, low-fat or fat-free milk, or 100% fruit or vegetable juice low in added sugar) and unsweetened or no-sugar-added versions of canned fruit, fruit sauces, and yogurt in place of sugary grain-based and dairy desserts.

12) Reduce intake of foods high in saturated fats to those high in polyunsaturated and monounsaturated fats by choosing lower-fat forms of foods and beverages containing solid fats (e.g., fat-free or low-fat milk instead of whole or 2% milk, low-fat cheese instead of regular cheese, lean rather than fatty cuts of meat); consuming smaller portions of foods containing saturated fats or consuming them less often; and replacing some fatty meats or regular cheese with vegetables, whole grains, lean meats, and low-fat cheese.

13) Reduce sodium intake by choosing low-sodium, reduced-sodium or no-salt-added versions of foods and choosing fresh, frozen vegetables, poultry, seafood, pork, and lean meat rather than processed meat and poultry, cooking from scratch, and limiting sauces, mixes, and "instant" products, and flavoring foods with natural herbs and spices instead of salt.

Reference

U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015). 2015–2020 Dietary Guidelines for Americans [Internet]. 8th ed. 2015 Dec [cited 2016 Feb 4]. Retrieved from http://health.gov/dietaryguidelines/2015/