

MODULE

2

DIABETES RISK FACTORS



hriana

Group Activity: Recognizing my risk factors

Steps to follow:

- Ask participants to help you set up stations. In each station, place a table with the different materials to measure the risk factors.
- Pass out Risk Factors Self-Assessment forms, and say: “We will set up several stations in the room, one for each risk factor.”
- Ask participants to go through each station and consider whether or not they have the specific risk factor displayed at the station.

| Go around to each colored paper station and fill in the answers to each risk factor. Circle yes or no for each question. | Mark X if you answer YES |
|---|--------------------------|
| Height: _____ cm / inches Weight: _____ Kg / lb BMI: _____ Is your BMI higher than 25? YES / NO | |
| Waist: _____ cm / inches Is your waist size higher than 35/40 inches? YES / NO | |
| Blood Pressure: _____ mm Hg. Is your Blood pressure higher than 140/90 mm Hg? YES / NO | |
| Total Cholesterol: _____ mg/dL (More than 200 mg/dL) YES / NO HDL _____ mg/dL (Less than 45 males and 55 women mg/dL) YES / NO LDL _____ mg/dL (More than 100 mg/dL) YES / NO Triglycerides _____ mg/dL (more than 150 mg/dL) YES/NO | |
| I exercise _____ minutes (total) per week Do you exercise less than 150 minutes a week? YES / NO | |
| Do you currently smoke? YES / NO | |
| Do you experience high stress in your life? YES / NO | |
| Have you been diagnosed with Prediabetes? YES / NO Metabolic Syndrome? YES / NO Acanthosis Nigricans? YES / NO | |
| Are you older than 45 years? YES / NO | |
| Are you African American, Latino/Hispanic American, Native American, and/or Pacific Islander? YES / NO | |
| Do you have family members with type 2 diabetes? YES / NO _____ Parents _____ Siblings _____ Children | |
| If you are a woman, did you ever have Gestational Diabetes? YES / NO Were you ever diagnosed with polycystic ovary syndrome? YES / NO | |

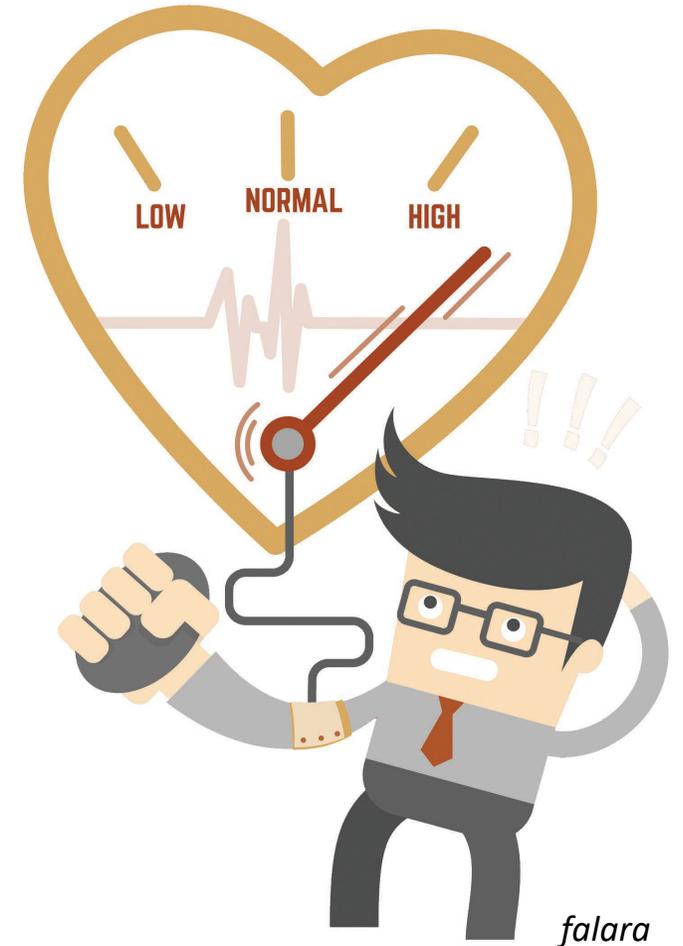
- As they go through the stations, ask them to take their measurements, to gather information and to write it down in their Self-Assessment Form. Ask them to take their blood pressure. Also, ask them to weigh themselves and to measure their height in order to calculate their BMI. If possible try to have equipment to measure total cholesterol.
- Allow participants to complete their sheets.
- Now ask the participants: “How many risk factors did you discover? What can you do about it?” Allow freedom to share. If somebody does not want to share his or her information do not push. You can ask the participants to do the exercise at home to find out their risk factors.
- Refer any persons with abnormal results to medical care.

I. WHAT IS A RISK FACTOR?

A characteristic that increases the possibility of developing diabetes and other illnesses. This includes behavior, family history and environment.

A. Modifiable Risk Factors

1. Overweight and obesity
2. Sedentary lifestyle
3. Increased lipids (fats) in blood
4. High blood pressure
5. Pre-diabetes
6. Smoking



B. Non-modifiable Risk Factors



Heredity



Age: 45 or older



Ethnic Group



History of gestational diabetes

II. MODIFIABLE RISK FACTORS

A. Obesity

1. Measures of obesity



Body appearance



Waist circumference



Arm circumference



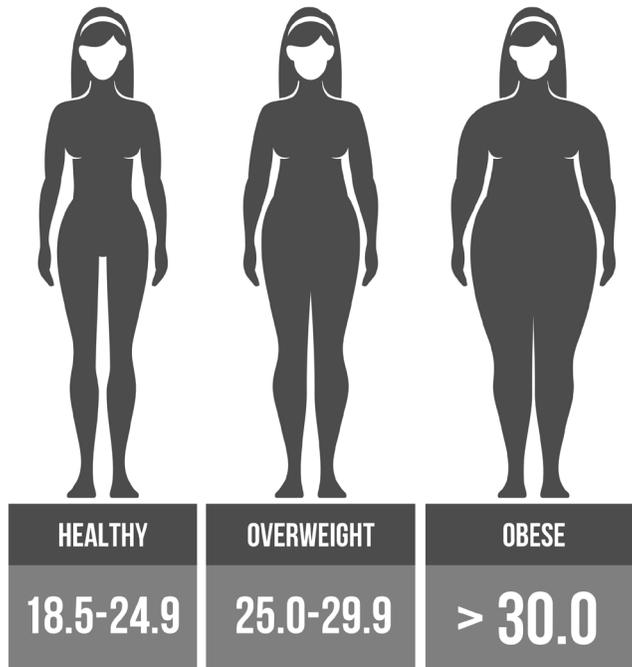
Hand circumference



Total weight

2. Body Mass Index (BMI)

- a. Persons with BMI > 25 have risk for diabetes
- b. People in some ethnic groups with a BMI > 24 may be at a higher risk than if they have other risk factors.



| Weight lbs | 100 | 105 | 115 | 110 | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 |
|---------------|-------------|---------|------------|-------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Weight kgs | 45.5 | 47.7 | 52.3 | 50.5 | 54.5 | 56.8 | 59.1 | 61.4 | 63.6 | 65.9 | 68.2 | 70.5 | 72.7 | 75.0 | 77.3 | 79.5 | 81.8 | 84.1 | 86.4 | 88.6 | 90.9 | 93.2 | 95.5 | 97.7 |
| 5'0" / 152.4 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
| 5'1" / 154.9 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 |
| 5'2" / 157.4 | 18 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| 5'3" / 160.0 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 5'4" / 162.5 | 17 | 18 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| 5'5" / 165.1 | 16 | 17 | 18 | 19 | 20 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 31 | 32 | 33 | 34 | 35 | 35 |
| 5'6" / 167.6 | 16 | 17 | 17 | 18 | 19 | 20 | 21 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 29 | 29 | 30 | 31 | 32 | 33 | 34 | 34 |
| 5'7" / 170.1 | 15 | 16 | 17 | 18 | 18 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 29 | 29 | 30 | 31 | 32 | 33 | 33 |
| 5'8" / 172.7 | 15 | 16 | 16 | 17 | 18 | 19 | 19 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 32 | 32 |
| 5'9" / 175.2 | 14 | 15 | 16 | 17 | 17 | 18 | 19 | 20 | 20 | 21 | 22 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 31 |
| 5'10" / 177.8 | 14 | 15 | 15 | 16 | 17 | 18 | 18 | 19 | 20 | 20 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 30 |
| 5'11" / 180.3 | 14 | 14 | 15 | 16 | 16 | 17 | 18 | 18 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 |
| 6'0" / 182.8 | 13 | 14 | 14 | 15 | 16 | 17 | 17 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 27 | 27 | 28 | 29 |
| 6'1" / 185.4 | 13 | 13 | 14 | 15 | 15 | 16 | 17 | 17 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 27 | 27 | 28 |
| 6'2" / 187.6 | 12 | 13 | 14 | 14 | 15 | 16 | 16 | 17 | 18 | 18 | 19 | 19 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 27 | 27 |
| 6'3" / 190.5 | 12 | 13 | 13 | 14 | 15 | 15 | 16 | 16 | 17 | 18 | 18 | 19 | 20 | 20 | 21 | 21 | 22 | 23 | 23 | 24 | 25 | 25 | 26 | 26 |
| 6'4" / 193.0 | 12 | 12 | 13 | 14 | 14 | 15 | 15 | 16 | 17 | 17 | 18 | 18 | 19 | 20 | 20 | 21 | 22 | 22 | 23 | 23 | 24 | 25 | 25 | 26 |
| Height in/cm | Underweight | Healthy | Overweight | Obese | Extremely obese | | | | | | | | | | | | | | | | | | | |

3. Waist Circumference (WC)

| NORMAL WAIST CIRCUMFERENCE | |
|----------------------------|-----------------------|
| Men | At or below 40 inches |
| Women | At or below 35 inches |



Alan Poulson

B. Sedentary Lifestyle

1. Comforts of modern living
2. Lack of exercise



Balazs Justin

C. Blood Lipids (Fats)

1. A person is at risk of developing diabetes if:
 - a. HDL levels are low
 - b. LDL levels are high
 - c. Triglycerides levels are high

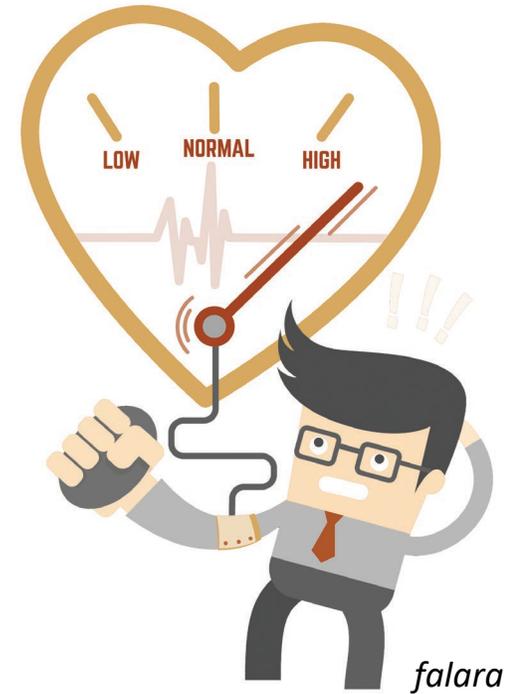
| LIPIDS | IDEAL VALUES |
|-------------------|--|
| LDL cholesterol | Less than 100 mg/dl |
| HDL cholesterol | Men: higher than 40 mg/dl Women: higher than 50 mg/dl |
| Triglycerides | Less than 150 mg/dl |
| Total cholesterol | Less than 200 mg/dl |

D. High Cholesterol

1. Diabetes increases triglycerides and decreases HDL leading to risk for heart attack and stroke.
2. Smoking and high cholesterol increase damage to the cardiovascular system produced by excess LDL.
3. Smoking increases triglycerides and decreases HDL cholesterol.

E. High Blood Pressure/Hypertension

1. Hypertension is an important risk factor for the development and worsening of diabetes complications, especially heart disease.
2. 2 of 3 adults with diabetes have high blood pressure.
3. Smoking and nicotine increase blood pressure.
4. High blood pressure leads to kidney damage.



| NORMAL BLOOD PRESSURE | CONTROLLED BLOOD PRESSURE FOR PERSON WITH DIABETES | HYPERTENSION |
|-----------------------|--|----------------|
| < 120/80 mm Hg | < 140/90 mm Hg | ≥ 140/90 mm Hg |

F. Pre-Diabetes

| FASTING GLUCOSE | GLUCOSE TOLERANCE TEST | A1C |
|-----------------------------|-----------------------------|-------------|
| ≥ 100 mg/dl and ≤ 125 mg/dl | ≥ 140 mg/dl and ≤ 199 mg/dl | 5.7% - 6.4% |

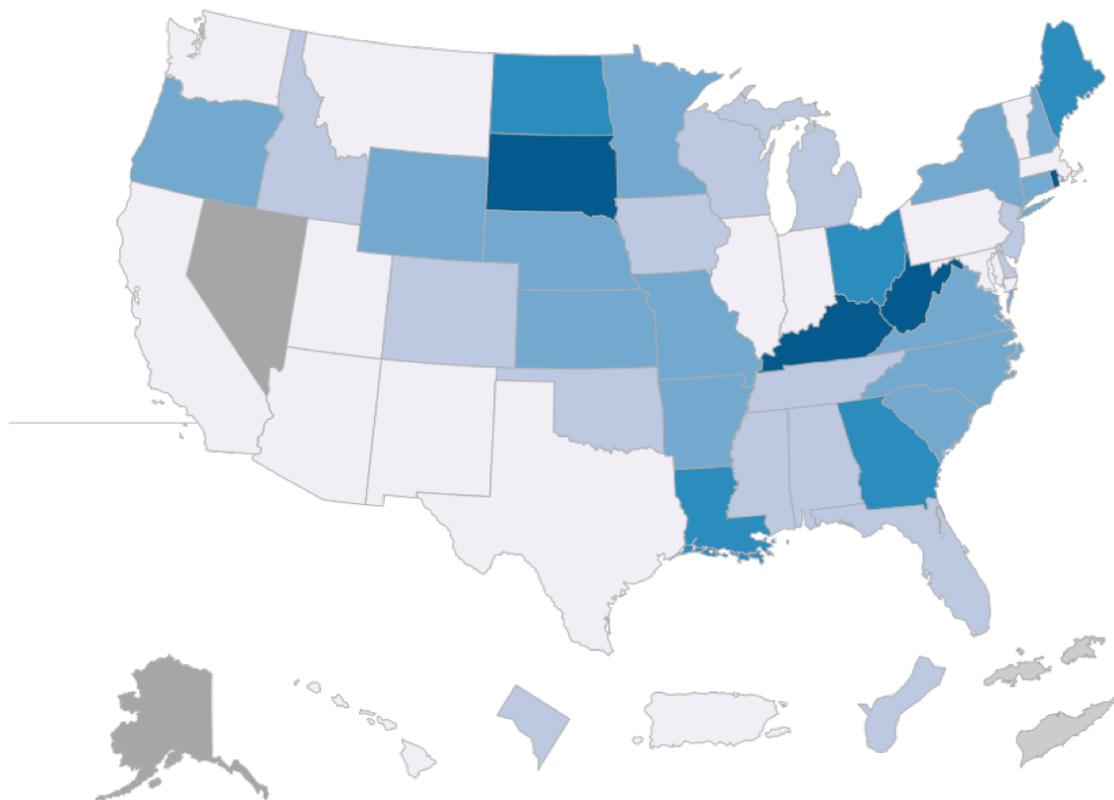
G. Smoking

1. Smoking increases damage to the cardiovascular system produced by diabetes and hypertension.
2. Increases risk for heart attack or stroke 11 times.
3. 3 times more likely to have kidney disease or to die of CVD.
4. 12% of diabetes cases are attributed to smoking.
5. Smokers tend to have lower weight but larger waist circumference.
6. Smoking cessation should be key element of diabetes prevention and treatment.



Ghenadie

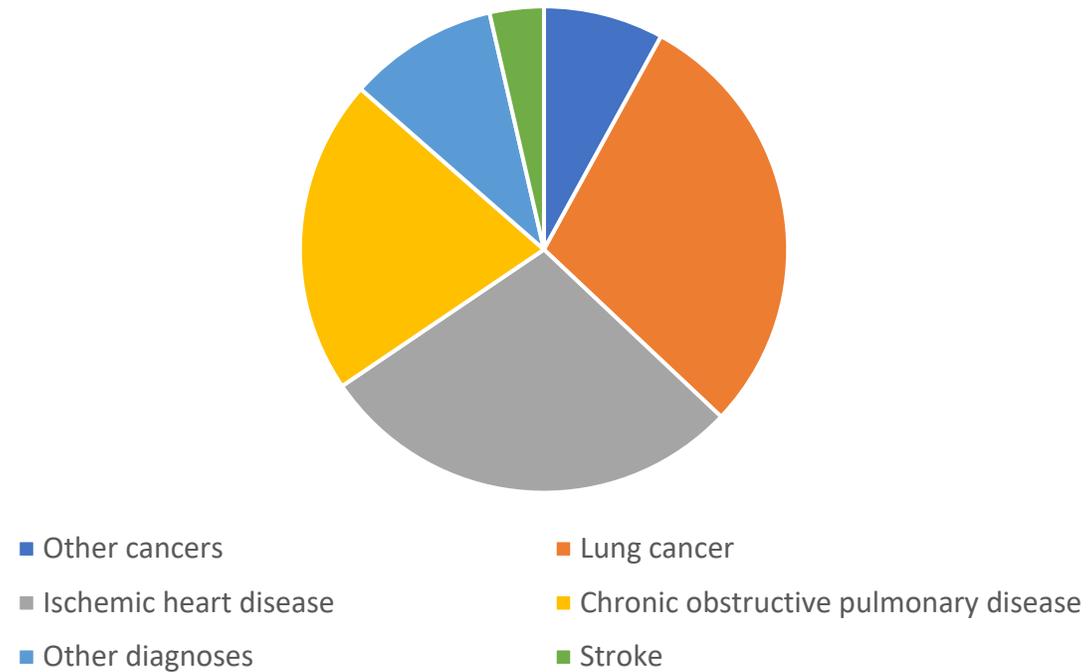
Percentage of adults with diabetes who are current smokers by state, 2015



| |
|-------------|
| 7.2 – 16.6 |
| 16.7 – 20.8 |
| 20.9 – 24.6 |
| 24.7 – 30.4 |
| 30.6 – 53.8 |
| No data |
| Suppressed |

About 480,000 U.S. deaths each year attributable to cigarette smoking.

Deaths attributable to smoking



III. ASSOCIATED SIGNS OR HEALTH PROBLEMS

A. Acanthosis Nigricans

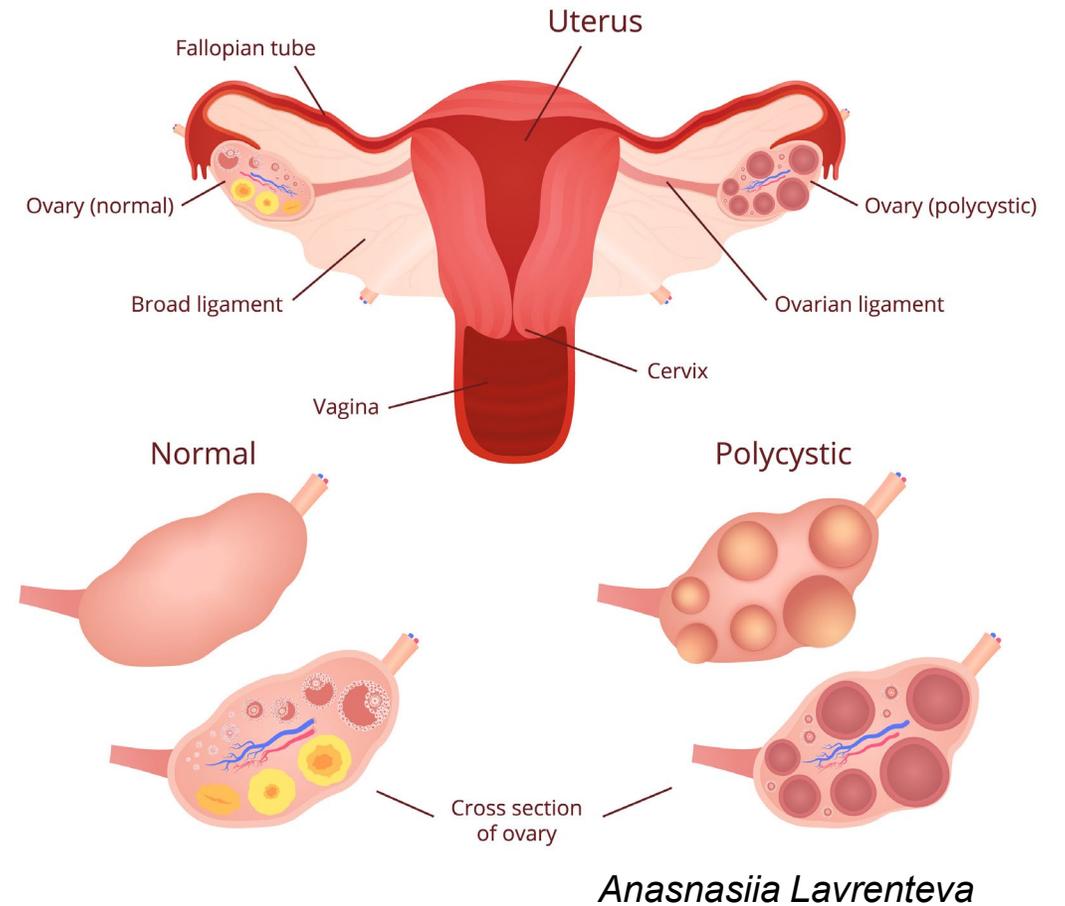
1. Pigmentation of the skin on the neck and armpits.
2. Indicates increased insulin production (hyperinsulinemia).
3. Goes away with weight loss.
4. In some states, part of school exam.



Benedicte Desrus/Alamy Stock Photo

B. Polycystic Ovarian Syndrome (PCOS)

1. Hormonal disorder.
2. Can be detected through regular medical care.
3. Early medical treatment can prevent or delay the development of type 2 diabetes.



IV. PREVALENCE OF DIABETES

| DIAGNOSED AND UNDIAGNOSED DIABETES AMONG PEOPLE AGED 20 YEARS OR OLDER, UNITED STATES 2012 | | |
|--|---------------------------------|---------------------------------------|
| | Number with diabetes (millions) | Percentage with diabetes (unadjusted) |
| TOTAL | | |
| 20 years or older | 28.9 | 12.3 |
| BY AGE | | |
| 20 - 44 | 4.3 | 4.1 |
| 45 - 64 | 13.4 | 16.2 |
| 65 years or older | 11.2 | 25.9 |
| BY SEX | | |
| Men | 15.5 | 13.6 |
| Women | 13.4 | 11.2 |

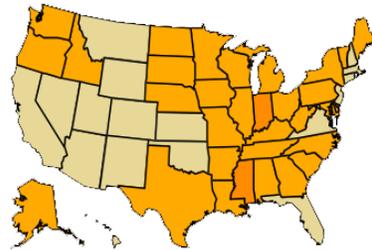
AGE-ADJUSTED PERCENTAGE OF PEOPLE AGED 20 YEARS OR OLDER WITH DIAGNOSED DIABETES, BY RACE/ETHNICITY, UNITED STATES 2010 - 2012

| | |
|--|------|
| Non-Hispanic whites | 7.6 |
| Asian Americans | 9.0 |
| Hispanics | 12.8 |
| Non-Hispanic blacks | 13.2 |
| American Indians/Alaska natives | 15.9 |
| AMONG HISPANIC ADULTS THE PERCENTAGE OF DIAGNOSED DIABETES WAS: | |
| Central and South Americans | 8.5 |
| Cubans | 9.3 |
| Mexican Americans | 13.9 |
| Puerto Ricans | 14.8 |

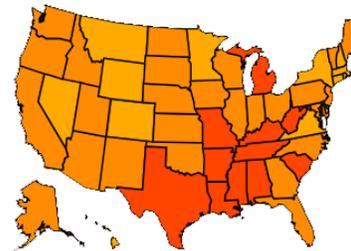
AGE-ADJUSTED PREVALENCE OF OBESITY AND DIAGNOSED DIABETES AMONG US ADULTS

OBESITY
(BMI \geq 30 kg/m²)

1994



2000



2015



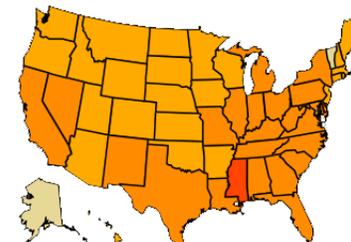
No data
 < 14%
 14% - 17.9%
 18% - 21.9%
 22% - 25.9%
 \geq 26%

DIABETES

1994



2000

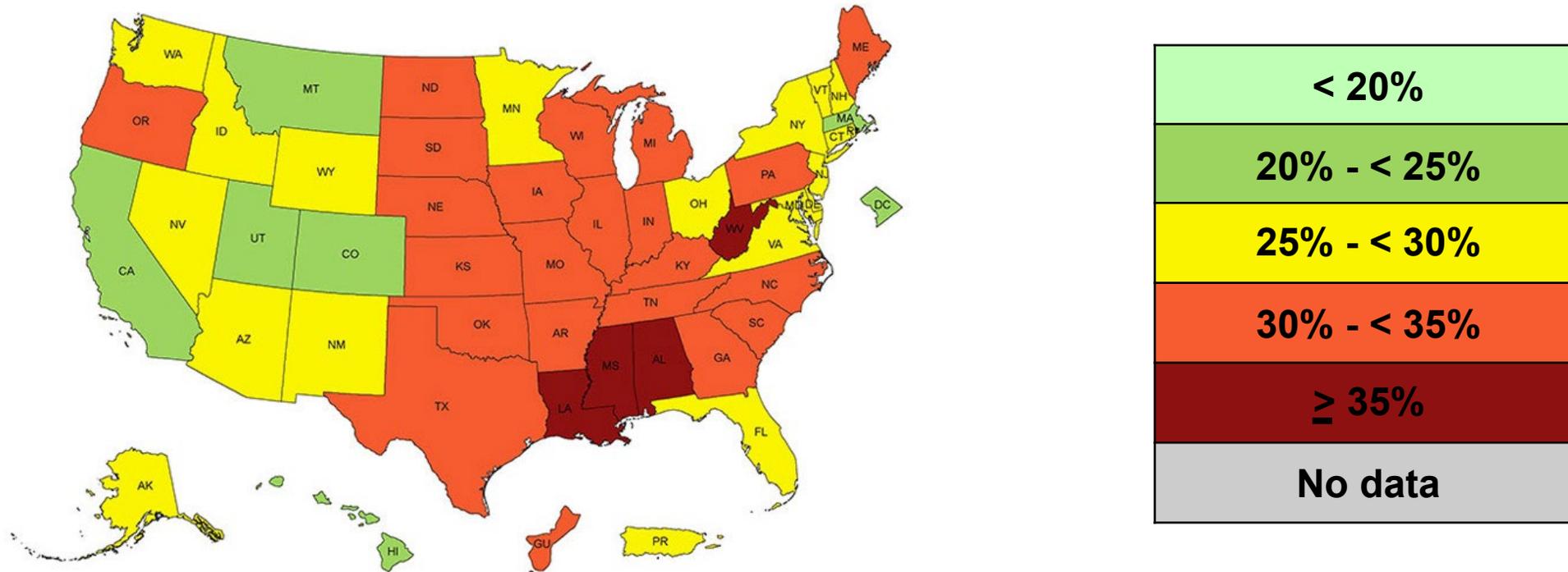


2015

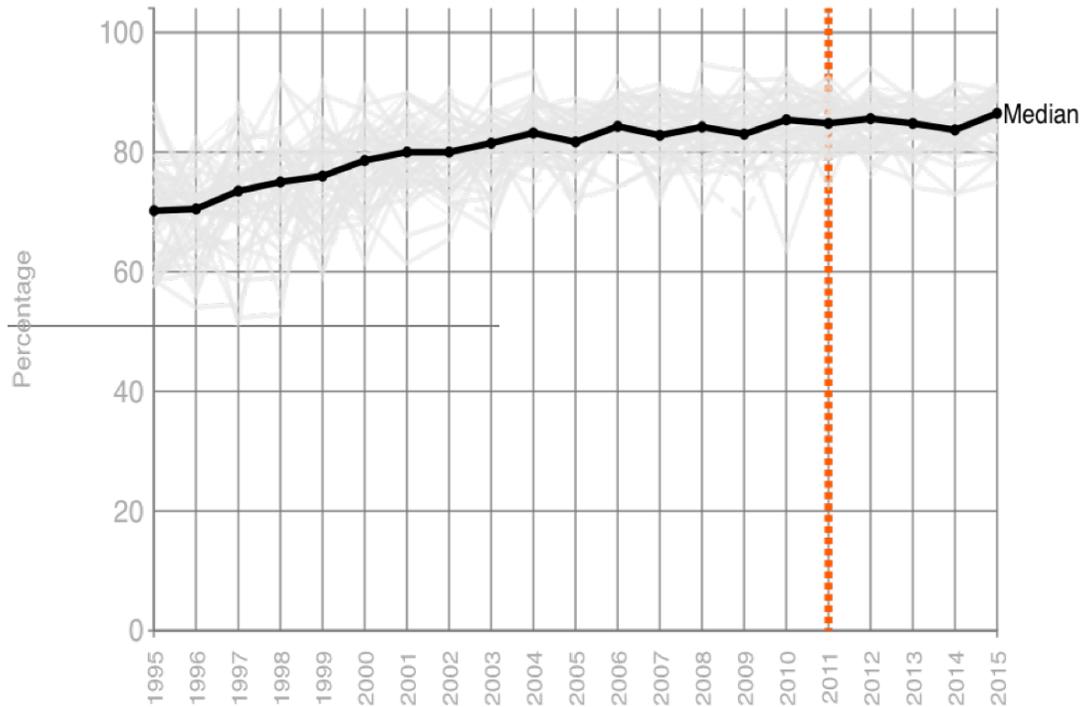


No data
 < 4.5%
 4.5% - 5.9%
 6% - 7.4%
 7.5% - 8.9%
 \geq 9%

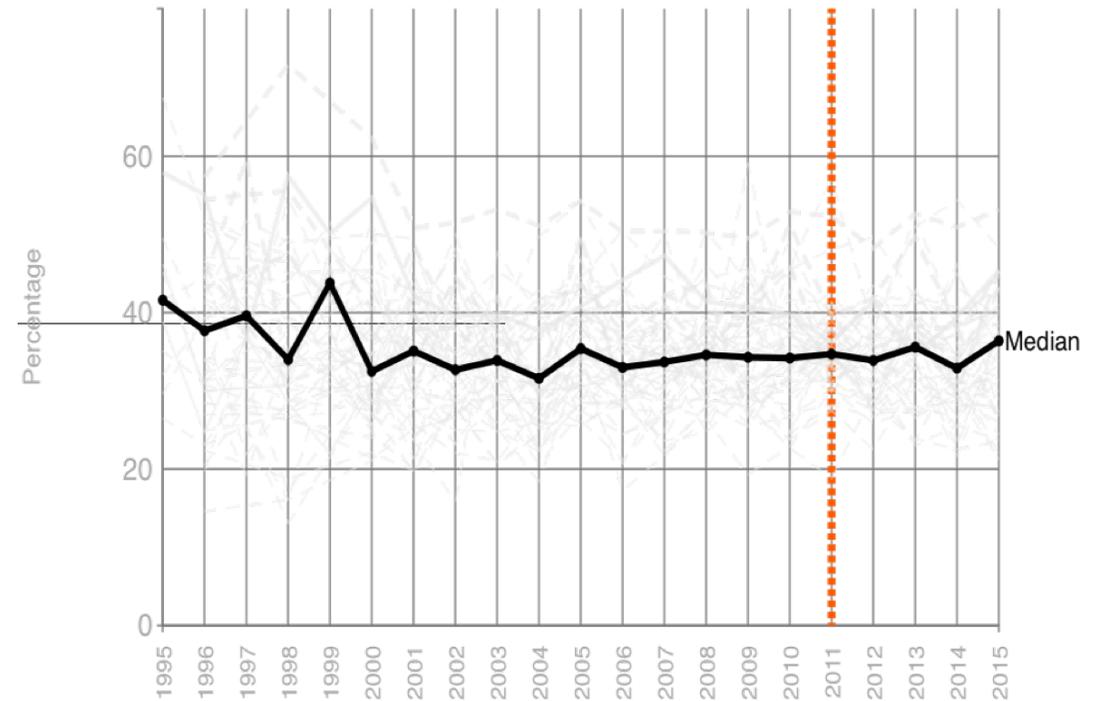
Prevalence of self-reported obesity among U.S. adults by state and territory, BRFSS, 2015



Age-adjusted percentages of obesity for adults with diabetes, United States, 1995 - 2015



Age-adjusted percentages of physical inactivity for adults with diabetes, United States, 1995 - 2015



* Vertical dotted line indicates major changes to survey methods in 2011.

V. ROLE OF COMMUNITY HEALTH WORKER

- A. Identify your own risks.
- B. Identify the risks in your family, neighbors, friends and community.
- C. Refer people at risk of diabetes to providers.
- D. Educate the community on prevention and control of modifiable risk factors.

Add a picture of a community health worker or a healthcare pro talking with a patient.

This concludes Module 2: Diabetes Risk Factors. For more information on this topic, please see the curriculum.



REFERENCES

American Diabetes Association. (2011). In Guthrie G. (Ed.), *Complete Guide to Diabetes* (5th ed.). Alexandria, VA: American Diabetes Association.

American Diabetes Association. (2014). Diagnosis and classification of diabetes mellitus. *Diabetes Care*, 37(Sup1), S81-S90.

Balk, E. M., Earley, A., Roman, G., Avendano, E. A., Pittas, A. G., & Remington, P. L. (2015). Combined diet and physical activity promotion programs to prevent type 2 diabetes among persons at increased risk: A systematic review for the community preventive services task force. *Annals of Internal Medicine*, 163(6), 437-451.

Bansal, N. (2015). Prediabetes diagnosis and treatment: A review. *World Journal of Diabetes*, 6(2), 296-303.

Bergman, M. (2014). The early diabetes intervention program- is early actually late? *Diabetes/Metabolism Research and Reviews*, 30(8), 654-658.

Kaur, J. (2014). A comprehensive review on metabolic syndrome. *Cardiology Research and Practice*, 2014, 1-21.

Nathan, D. M. (2015). Diabetes advances in diagnosis and treatment. *The Journal of the American Medical Association*, 314(10), 1052-1062.

Rynders, C. A., & Weltman, A. (2014). High-intensity exercise training for prevention of type 2 diabetes mellitus. *The Physician and Sportsmedicine*, 42(1), 7-14.

Yoon, U., Kwok, L. L., & Magkidis, A. (2013). Efficacy of lifestyle interventions in reducing diabetes incidence in patients with impaired glucose tolerance: A systematic review of randomized controlled trials. *Metabolism-Clinical and Experimental*, 62(2), 303-314.