

**IOWA**

Institute for Public Health  
Practice, Research and Policy

# Tackling Data

Using the Bite, Snack, Meal Approach

2024



# Welcome



## Tackling Data

- Advances the participant's knowledge of quantitative data, provides skill building to assist in visualizing and communicating data, and provides supplemental resources



## Visualize This

- Advances the participant's ability to identify and communicate the main message from their data and develop the best visualizations to create a story with impact



## Disaggregate It

- Advances the participant's understanding of and ability to apply health equity frameworks to public health practice especially interpretation, use, and communication of data to diverse audiences for actionable change in your community



# Meet your training team



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**Training provided in partnership with the Iowa Institute of Public Health Research and Policy through a contract from the Iowa Department of Health and Human Services**

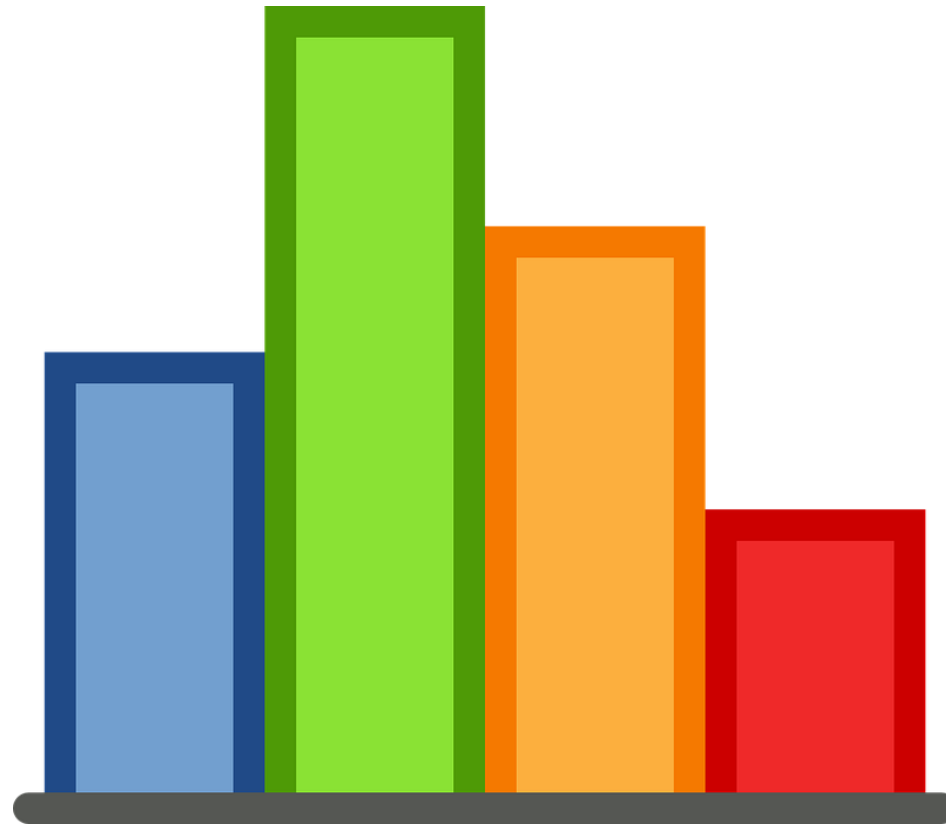
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# Agenda

Welcome

Module 1

Break

Module 2 Part 1

Activity 1

Module 2 Part 2

Break

Module 3

Activity 2

Wrap Up



# At the end of this training course, you will be able to...

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- Use and interpret measures of disease frequency in defined populations
- Understand the use of crude and adjusted measures of disease frequency in public health practice
- Develop audience-focused communication strategies using a Bite, Snack, Meal approach



# Module 1

## Quantifying the Issue

# At the end of this module, you will be able to...

---

- *Use and interpret measures of disease frequency in defined populations*
- *Understand the use of crude and adjusted measures of disease frequency in public health practice*
- Develop audience-focused communication strategies using a Bite, Snack, Meal approach (Modules 2 and 3)

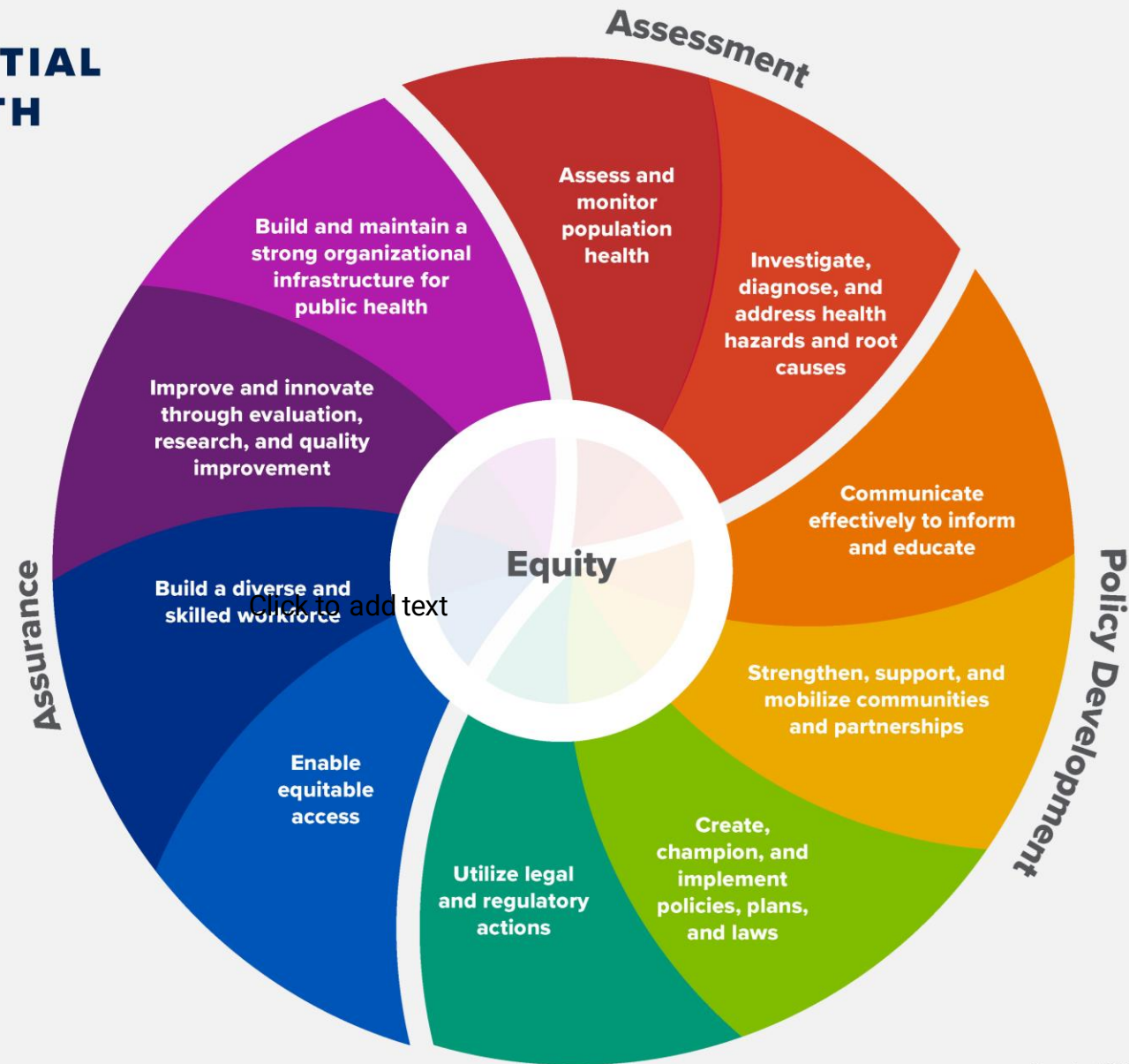




# THE 10 ESSENTIAL PUBLIC HEALTH SERVICES

*To protect and promote the health of all people in all communities*

The 10 Essential Public Health Services provide a framework for public health to protect and promote the health of all people in all communities. To achieve optimal health for all, the Essential Public Health Services actively promote policies, systems, and services that enable good health and seek to remove obstacles and systemic and structural barriers, such as poverty, racism, gender discrimination, and other forms of oppression, that have resulted in health inequities. Everyone should have a fair and just opportunity to achieve good health and well-being.



Created 2020

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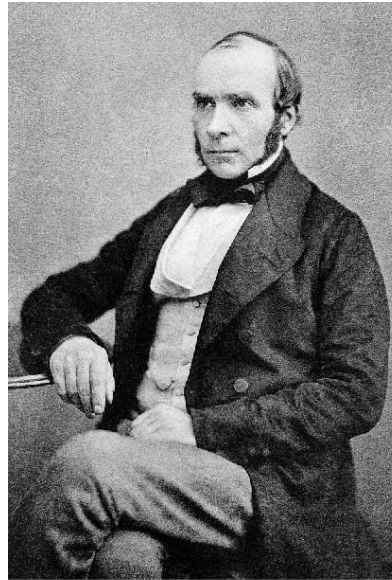
# Module 1 – Part 1



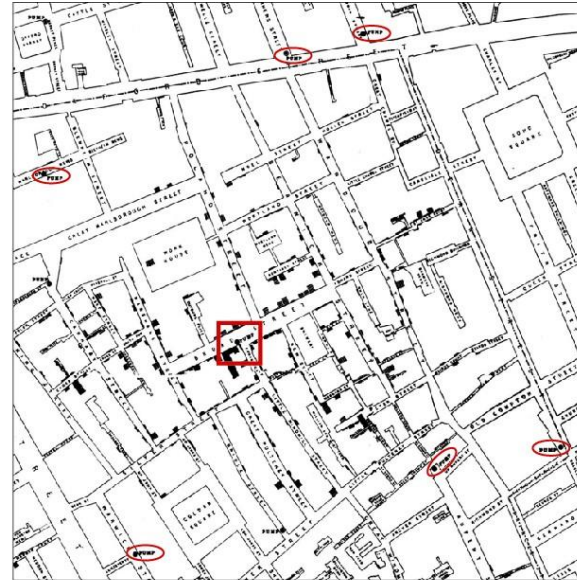
(Peter Drucker)

# Epidemiology

- Study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems



(a)



(b)





**Types of  
Data We Use  
in Public  
Health**

**Health Outcomes**

**Risk Factors and/or  
Behaviors**

**Demographic  
Characteristics**

**Resource Data (including  
Community  
Characteristics)**



# Descriptive Epidemiology

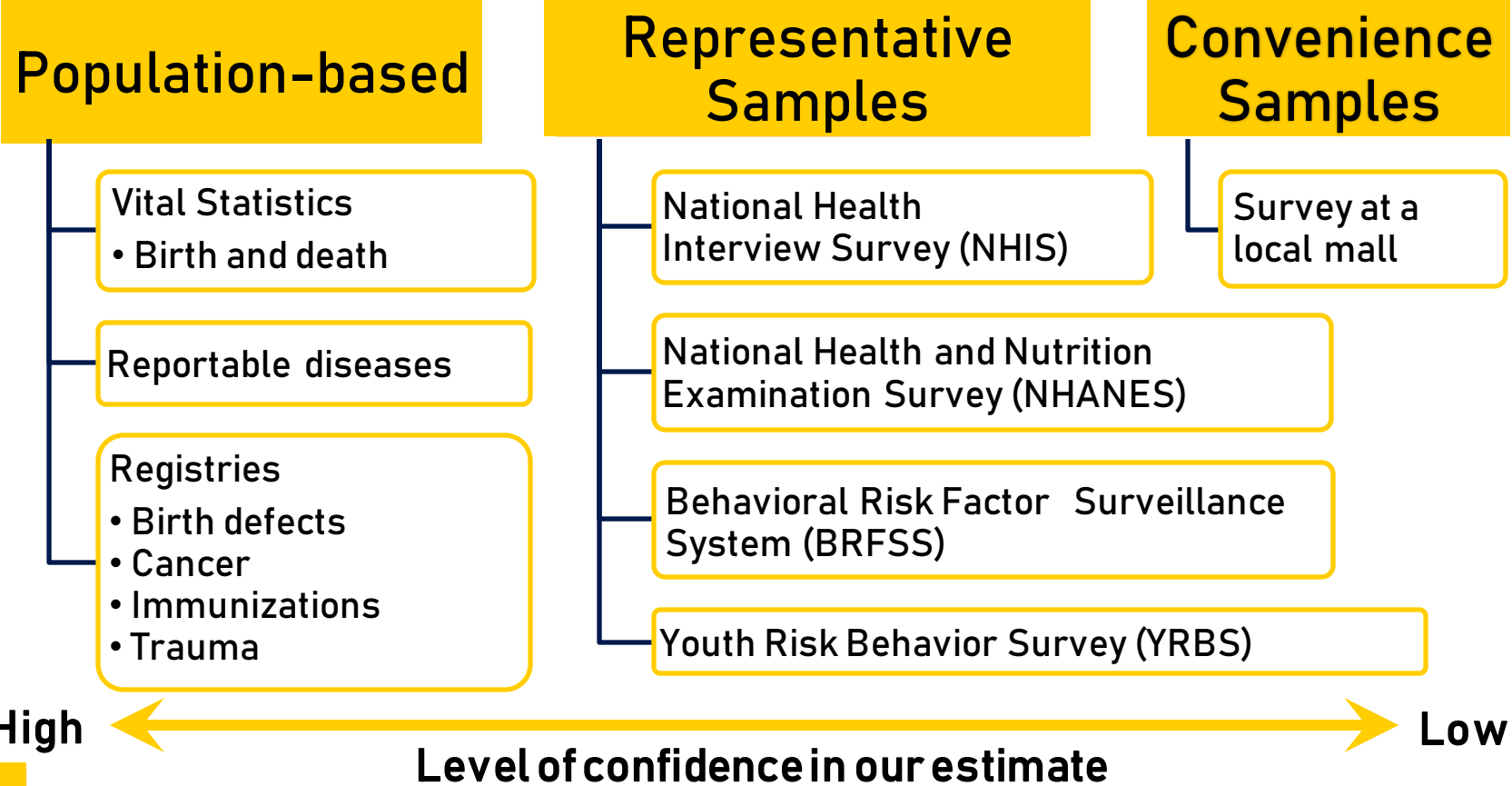
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- Frequency and the distribution of outcomes and risk factors in populations (patterns by person, place, time)
- Assess the extent of a disease
- Can provide hypotheses of etiologic research



# Public Health Surveillance Collection Methods

Provide varying levels of confidence in the data





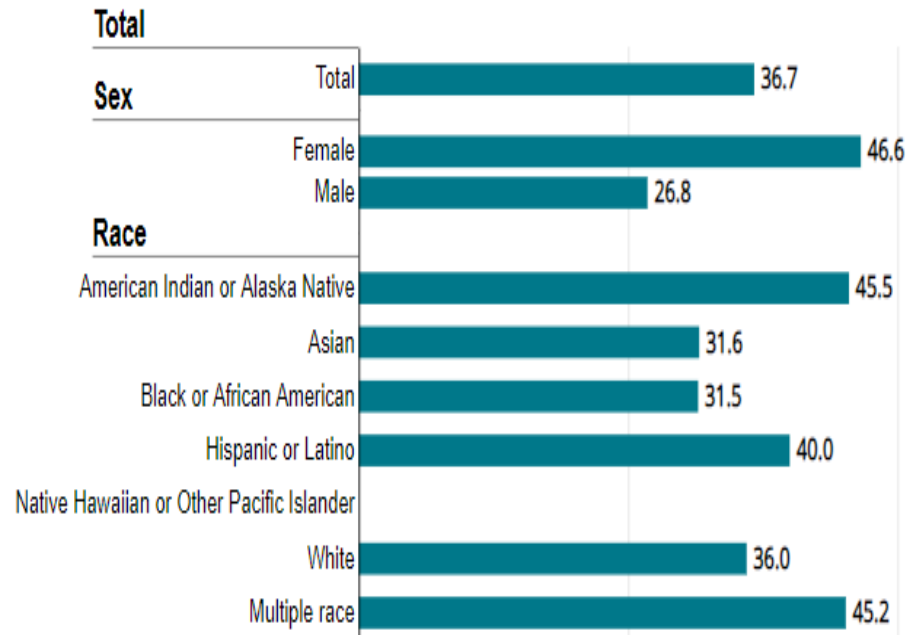
# PERSON

## Unintentional Injuries And Violence

### High School Students Who Felt Sad Or Hopeless\*

Location United States ▼

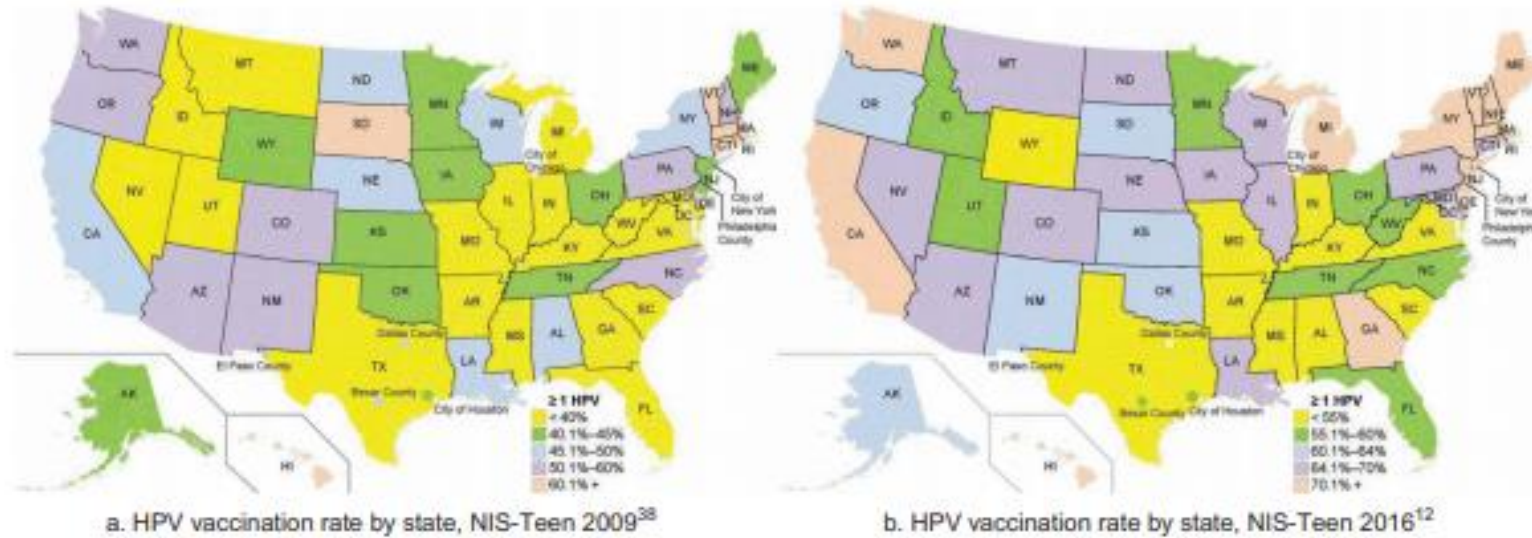
Details From a Specific Year 2019 ▼



# Changes in HPV vaccination initiation (>= 1 dose) among 13-17 yr old females in the US from 2009 to 2016

US FDA first approved Gardasil in 2006

PLACE, TIME



(Hirth, Human Vaccines & Immunotherapeutics 2019)





# Descriptive Epidemiology

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- Measures of frequency
- Prevalence vs. incidence
- Role of intermediate indicators



# Measures of Frequency

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- Counts
  - There were 218 cases of breast cancer in Johnson County in 2017-2019.
- Ratios
  - There were twice as many new cases of breast cancer in White women as compared to Black women in Johnson County in 2017-2019.
- Proportions or Percents
  - 68% of women above the age of 50 yrs in Johnson County are current on mammography screening
- Rates
  - The incidence rate of breast cancer in Johnson County from 2017-2019 was 124.9 per 100,000 women.



# Measures of Frequency

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**Proportions/Percents and Rates give you information about the number of events in your population relative to the population size**



# Descriptive Epidemiology

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✓ Measures of frequency

- Prevalence vs. incidence
- Role of intermediate indicators



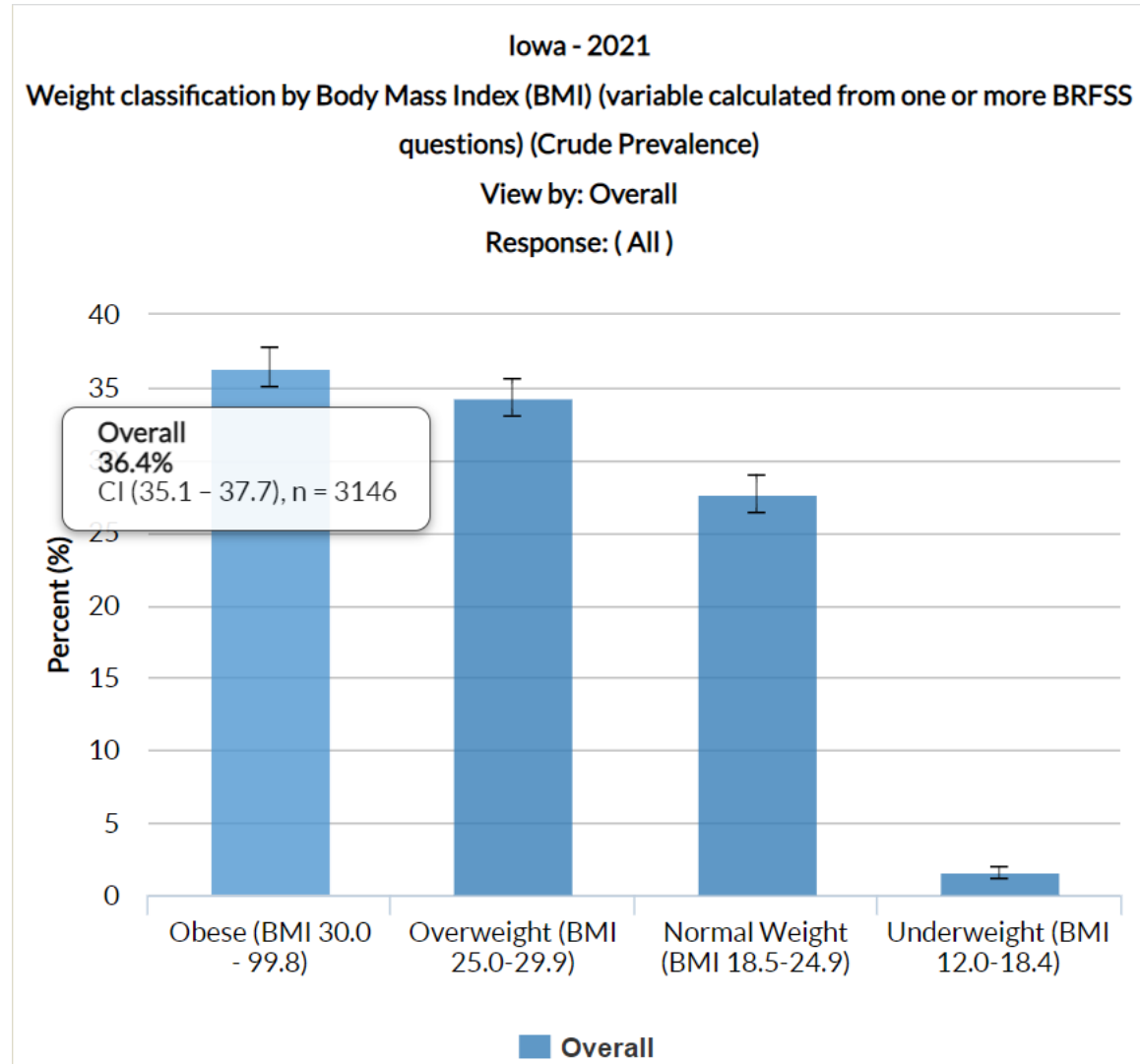
# Prevalence vs. Incidence

- Prevalent cases are **existing** cases of disease in the population during a defined period
- Prevalence measures the proportion of individuals in a defined population that have a disease during a defined period relative to the population size. Usually seen as a percent.
- Incident cases are **new** cases of disease that develop in the population at risk during a defined period
- Incidence measures the proportion of individuals in a defined population that develop disease/are diagnosed with disease during a defined period relative to the population at risk. Usually seen as a rate per 100,000 people.



At the time of interview, report your height and weight:

Prevalence of Obesity, Iowa 2021



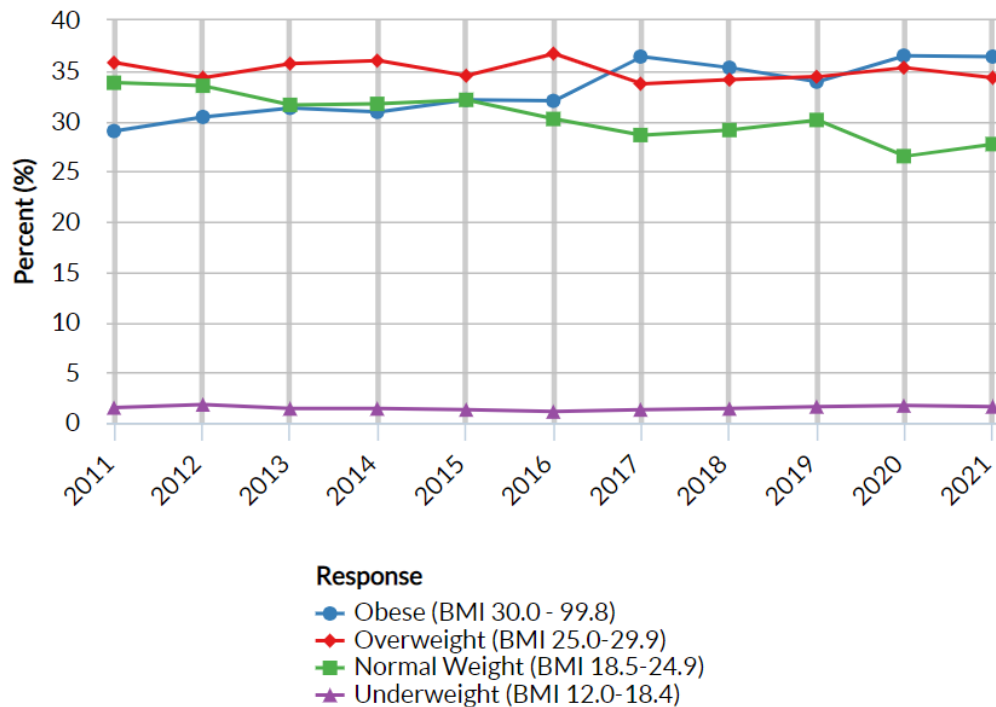
Data Source: Behavioral Risk Factor Surveillance System (BRFSS)



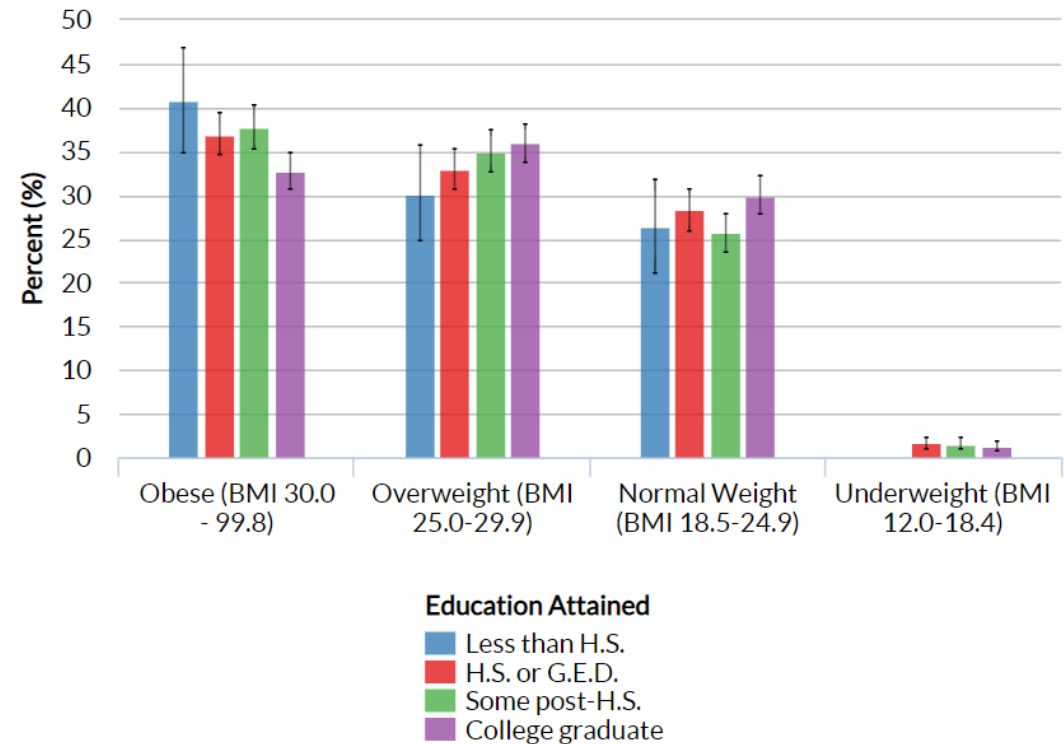
# What patterns do we see with Adult Obesity in IA?

What groups have higher/lower rates? What is the pattern over time?

Iowa - All available years  
 Weight classification by Body Mass Index (BMI) (variable calculated from one or more BRFSS questions) (Crude Prevalence)  
 View by: Overall  
 Response: ( All )



Iowa - 2021  
 Weight classification by Body Mass Index (BMI) (variable calculated from one or more BRFSS questions) (Crude Prevalence)  
 View by: Education Attained  
 Response: ( All )



Data Source: Behavioral Risk Factor Surveillance System (BRFSS)



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**What are some questions you might ask after looking at the prevalence rate for 2021 and the pattern of obesity from 2011-2021?**





# Descriptive Epidemiology

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- ✓ Measures of frequency
- ✓ Prevalence vs. incidence
- Role of intermediate indicators



# Role of Intermediate Outcomes

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## Intermediate outcomes may be used:

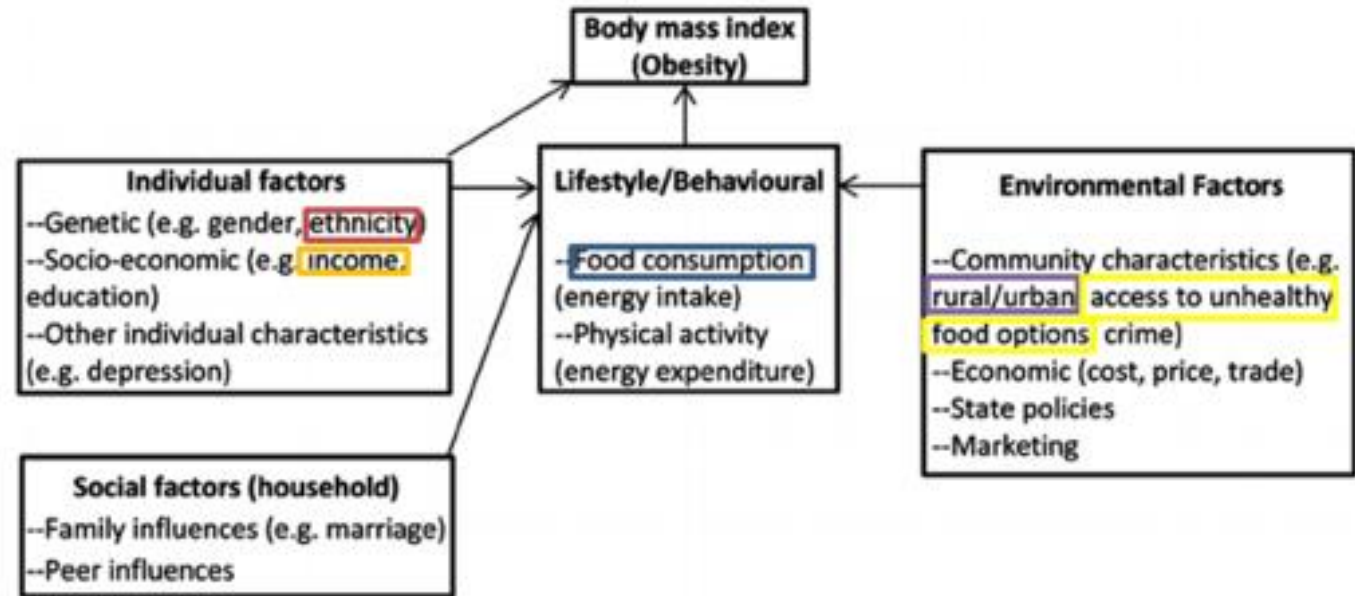
- When it is not feasible to wait years to see the effects of a new public health program,  
or
- There is sufficient type 1 evidence supporting the relationship between modifiable risk factors and disease reduction

What are some intermediate indicators that we might measure if our long-term goal is to reduce the prevalence of obesity in the US?



# What do we know about Obesity?

Conceptual model of obesity in adults:



(Sartorius B., et al., [PLoS ONE](#) 2015)



# Any Questions?

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## Module 1 – Part 2



# At the end of this module, you will be able to...

---

- Measure and characterize disease frequency in defined populations using principles of descriptive epidemiology and surveillance
- *Understand the use of crude and adjusted measures of disease frequency in public health practice*
- Develop audience-focused communication strategies using a Bite, Snack, Meal approach (Modules 2 and 3)



# Two main features of descriptive epidemiology

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DESCRIBE

COMPARE



# Types of Rates

---

- Crude, or **unadjusted**
- Category-specific, or **stratified**
- Standardized, or **adjusted**





# Types of Rates

---

- Crude, or **unadjusted**
- Category-specific, or **stratified**
- Standardized, or **adjusted**



# Crude (or Unadjusted) Rates

---

- Estimate the actual disease frequency for a population
- Can be used to provide data for allocation of health resources and public health planning
- Can be misleading if compared over time or across populations



# Crude (or Unadjusted) Rates

## Defining your population

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- Define disease



**Breast Cancer**

Standard inclusion and exclusion criteria (e.g., invasive, specific ICD-10 codes)

- Define population at risk



**IA Females**

- Select time frame



**2020**



# Crude (or Unadjusted) Rates Calculation methodology

---

## Compute disease rate for year 2020

Number of IA females  
diagnosed with breast cancer



2553

Number of females in IA at  
risk for breast cancer



1,587,866

Source: CDC WONDER



# Crude (or Unadjusted) Rates Calculation methodology

---

Compute disease rate for year 2020

2553 IA females diagnosed with breast cancer

1,587,866 female IA residents

= 0.001595 breast cancer cases / female IA residents/yr

= 159.5 breast cancer cases / 100,000 female IA residents/yr

We can use this rate to then estimate the number of cases we would expect in 2024 and have an idea of resources that we would need, etc.



# Types of Rates

---

- Crude, or **unadjusted**
- Category-specific, or **stratified**
- Standardized, or **adjusted**



# Category-Specific (or Stratified) Rates

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- Can be used for valid comparison of populations by category
- Allow us to disaggregate our data and look at variation across person, place, and time characteristics
- Can be cumbersome if there is a large number of categories to compare



# Category-Specific (or Stratified) Rates

## Two general categories

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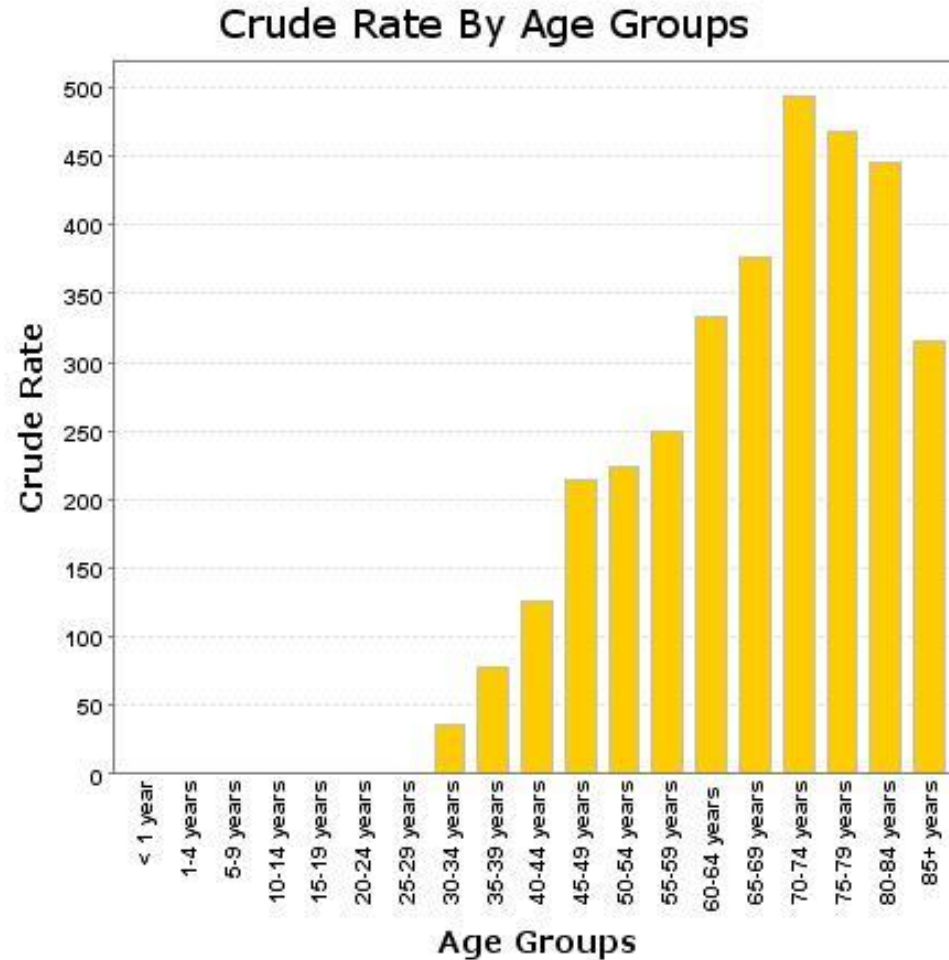
- **Age-specific:** crude rates across different age groups
- **“Other”- specific:** crude or standardized rates across different groups
  - Person: sex, race / ethnicity, education, income, health insurance status
  - Place: geographic unit (e.g., county), urban / rural, population density
  - Time: short or long-term trends, cyclic trends, cohort effects
- **BUT** don't forget about **Intersectionality** of characteristics





# Category-Specific (or Stratified) Rates

Age-Specific Female Breast Cancer Incidence Rates, Iowa 2020



\*\*Suppressed data, (less than 16 cases in the 20-24 and 25-29 years age groups)

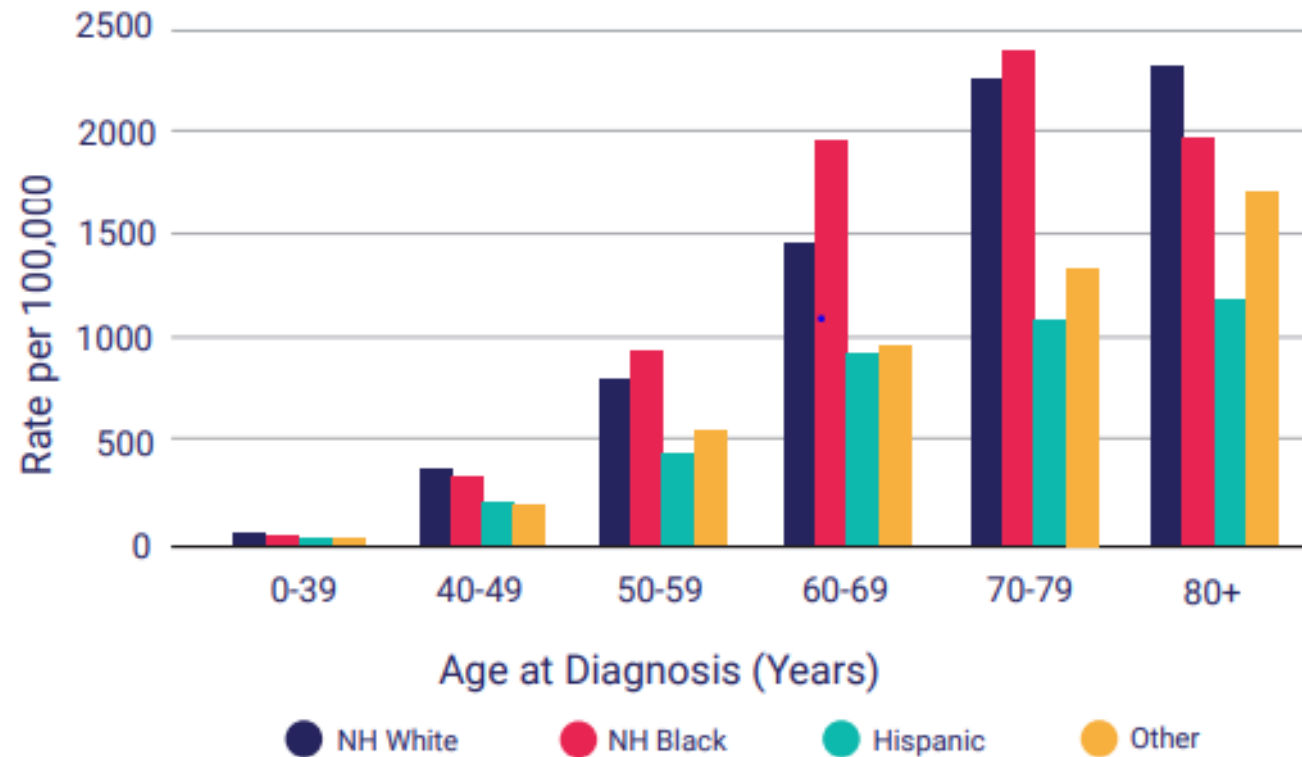
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# Category-Specific (or Stratified) Rates

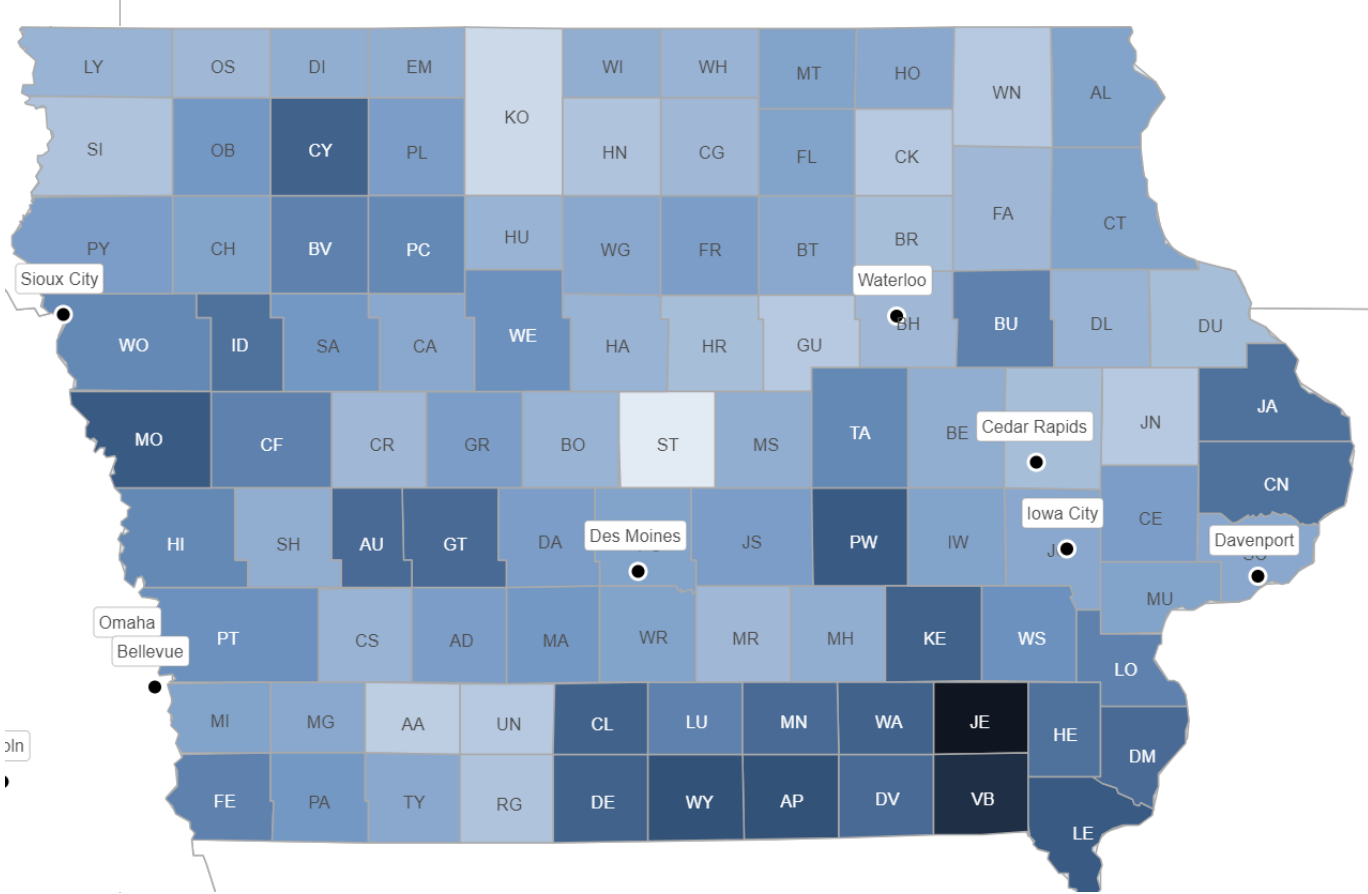
**Figure 5. Cancer Incidence Rates by Race/Ethnicity and Age at Diagnosis, All Sites, Male & Female, Iowa, 1994-2018**



# Small Area Estimation for Place-specific rates

Mammography screening by County, Iowa 2020

**Small area estimation: uses regression modeling methods to combine different data sources and generate prevalence estimates for small geographic areas**



# Types of Rates

---

- Crude, or **unadjusted**
- Category-specific, or **stratified**
- Standardized, or **adjusted**



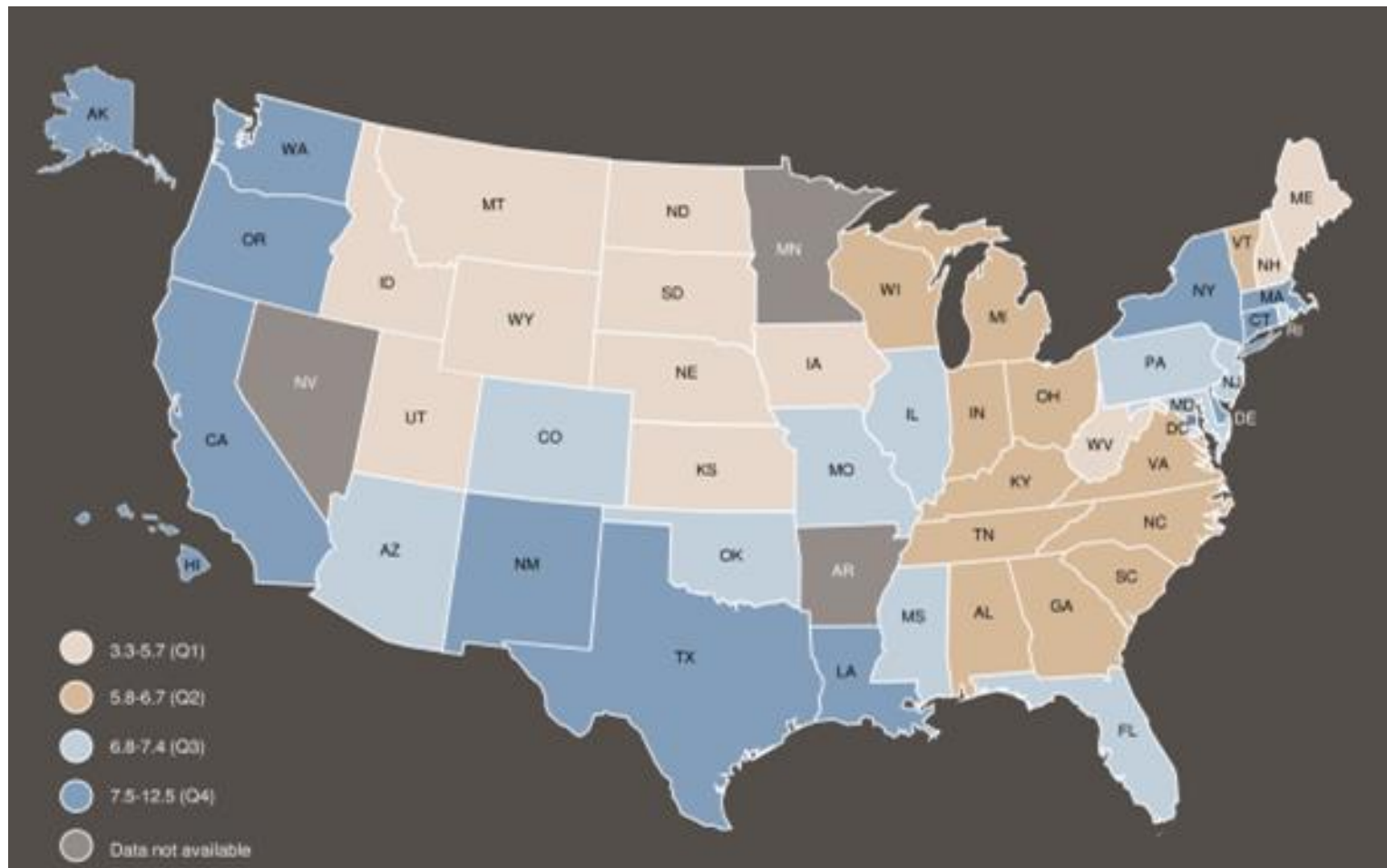
# Are we comparing apples to apples?

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What makes them different and is that important?





- Figure 1.** Age-adjusted incidence rates for 2008 to 2012 of liver and intrahepatic bile duct cancer are illustrated by state for areas in the United States with high-quality incidence data. Rates are per 100,000 persons and were age-adjusted to the 2000 US standard population.



# When do we use age-adjusted rates?

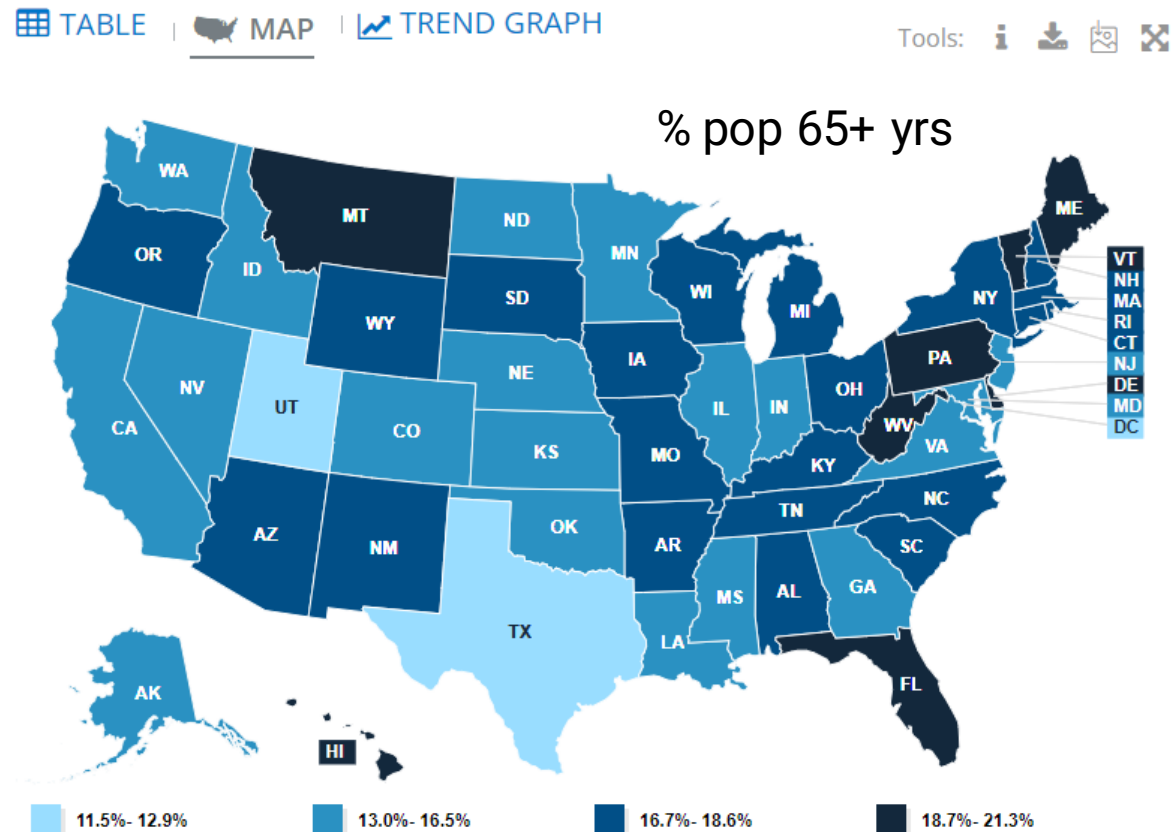
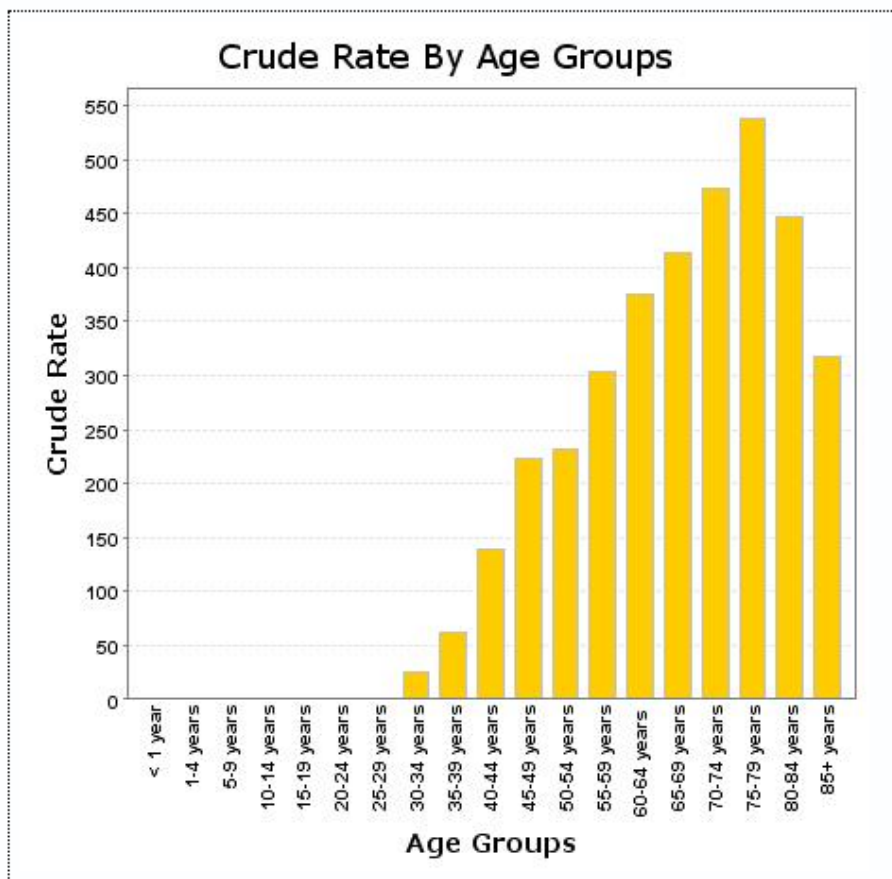
When-

- We want to compare two or more groups, **and**
- Disease risk varies by age, **and**
- Distribution of age is different between the groups being compared.



# When do we use age-adjusted rates?

## Population Distribution by Age





# Standardized (or Adjusted) Rates

- Removes the impact of different age distributions (or other factors) among populations
- Allows for direct comparisons of those populations
- Types of reference groups
  - One population to another
  - Using the 2000 U.S. Standard Million or Standard Population

Age	2000 US Standard Million	2000 US Standard Population (Census P25-1130)
00 years	13,818	3,794,901
01-04 years	55,317	15,191,619
05-09 years	72,533	19,919,840
10-14 years	73,032	20,056,779
15-19 years	72,169	19,819,518
20-24 years	66,478	18,257,225
25-29 years	64,529	17,722,067
30-34 years	71,044	19,511,370
35-39 years	80,762	22,179,956
40-44 years	81,851	22,479,229
45-49 years	72,118	19,805,793
50-54 years	62,716	17,224,359
55-59 years	48,454	13,307,234
60-64 years	38,793	10,654,272
65-69 years	34,264	9,409,940
70-74 years	31,773	8,725,574
75-79 years	26,999	7,414,559
80-84 years	17,842	4,900,234
85+ years	15,508	4,259,173
Total	1,000,000	274,633,642



# Ok, so now what?

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- ***When we age-adjust rates*** to a reference population, we have made the two (or more) populations look the same with regard to age distribution. Now ***any observed differences are due to other factors, not age.***
- If we wanted to try and determine why the age-adjusted rates differ between two populations, we would consider whether the prevalence of other risk factors for liver/bile duct cancer—chronic hep infections, alcohol use, obesity, tobacco use, type 2 diabetes—differ between the populations and may be a target for intervention.



# Any Questions?

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# Some final things to think about when using public health data

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- Accuracy of the data
  - Credible source? Valid measures?
- Completeness
  - Include all cases/events? Data elements missing?
- Representativeness
  - Does the data include all of the population of interest?



# Things to think about, continued

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- Reliability and Consistency over Time
  - Is data collected in the same way? Do definitions change over time?
- Data Challenges
  - No data exists; Small number of events
- Data Confidentiality and Access
  - Identifiability of cases; Can you get access to the data you need?



# Where do we go to get public health data?

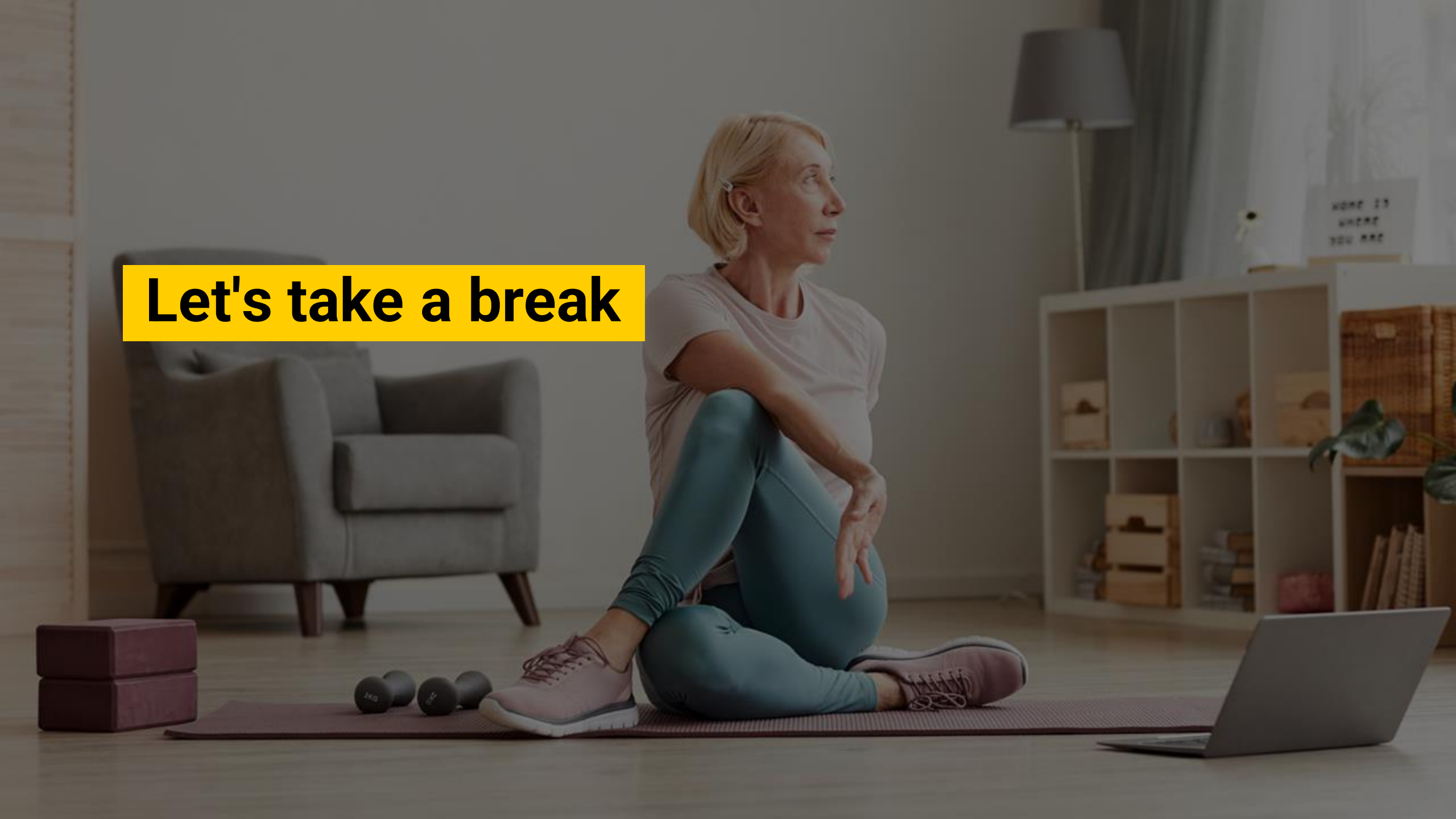
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## List of common resources

- <https://www.public-health.uiowa.edu/tackling-data-resources/>
- <https://www.public-health.uiowa.edu/iiphrp-data-resources/>



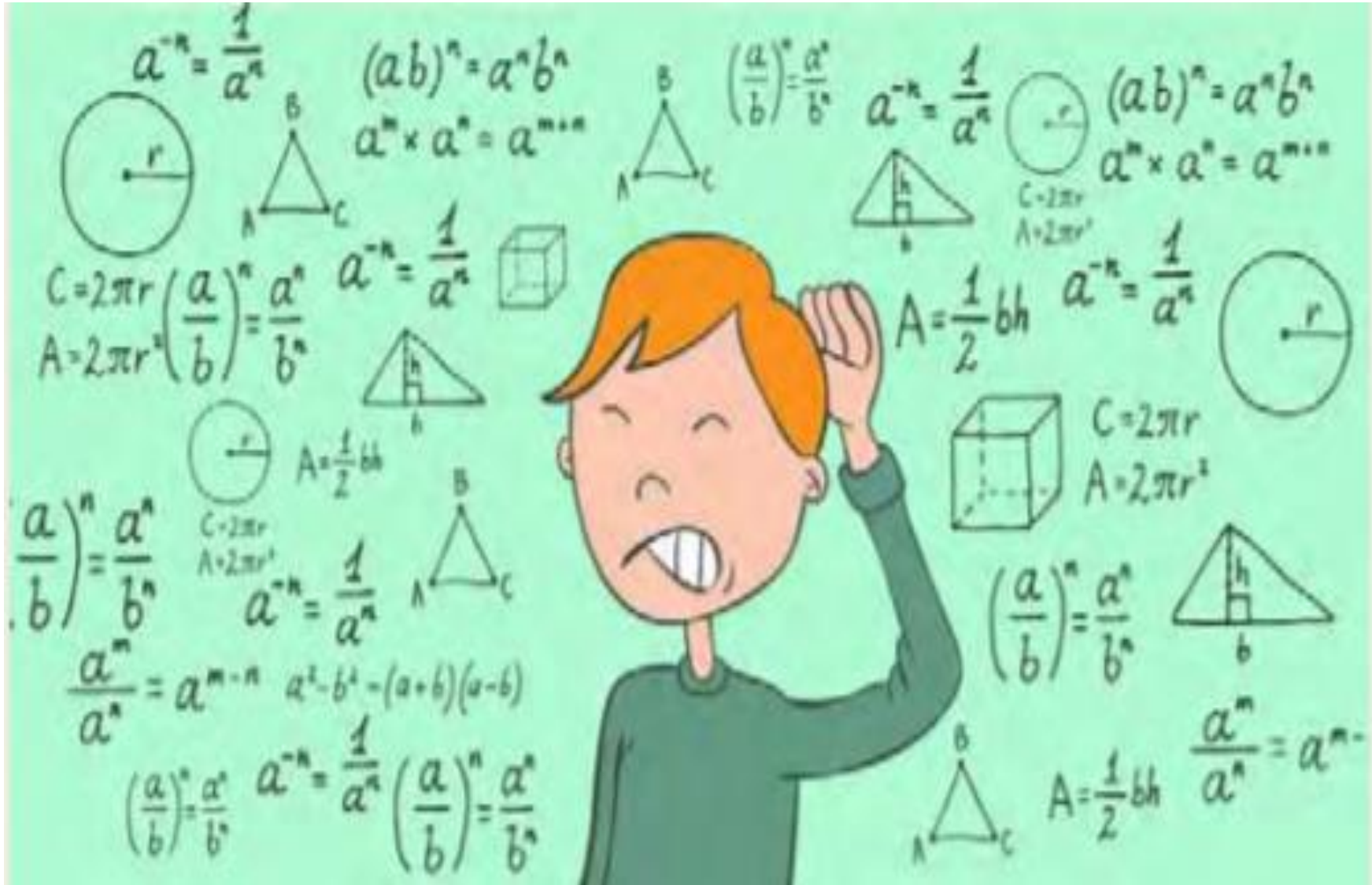
**Let's take a break**



# Module 2 – Part 1

Using Data to Tell Your Story





# Learning Objectives

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1. Understand and appreciate the importance of effective data communication to meet public health challenges.
2. Be aware of the principles of effective data communication as applied to different audiences.
3. Acquire tools and resources to create and disseminate messages about public health data to diverse audiences.



# Houston, we have a problem...

Leading Cancer Sites ↓	→ Count ↑↓	↔ Population ↑↓	← Age-Adjusted Rate Per 100,000 ↑↓
Brain and Other Nervous System	22,376	323,405,935	6.3
Breast *	247,506	323,405,935	66.3
Cervix Uteri	12,984	164,162,118	7.7
Colon and Rectum	141,270	323,405,935	37.4
Corpus Uteri	54,930	164,162,118	26.4
Esophagus	17,478	323,405,935	4.4
Gallbladder	4,075	323,405,935	1.1
Kidney and Renal Pelvis	63,639	323,405,935	16.8
Larynx	12,243	323,405,935	3.1
Leukemias	48,082	323,405,935	13.1
Liver	28,254	323,405,935	6.9
Lung and Bronchus	218,229	323,405,935	56.0
Melanoma of the Skin	82,476	323,405,935	22.3
Myeloma	25,286	323,405,935	6.5
Non-Hodgkin Lymphoma	68,403	323,405,935	18.3
Oral Cavity and Pharynx	45,543	323,405,935	11.7
Ovary	20,418	164,162,118	10.3
Pancreas	49,093	323,405,935	12.7
Prostate	192,443	159,243,817	101.4
Stomach	24,146	323,405,935	6.4
Thyroid	47,755	323,405,935	14.0
Urinary Bladder, invasive and in situ	73,469	323,405,935	19.2



A BETTER YOU

# How Much Sugar Do You Drink?

> About half of people in the U.S. age 2 and older consume sugar drinks daily, reports the Centers for Disease Control and Prevention. Although you might think twice about eating two or three candy bars in one sitting, you could be drinking that much and not even realize it.

1.5-oz. milk chocolate bar = 6 tsp. of sugar

## COMMON 20-OZ. CULPRITS



VANILLA LATTE



11 tsp. of sugar



SWEET TEA



11 1/4 tsp. of sugar



SODA



16 1/2 tsp. of sugar



FRUIT PUNCH



18 1/2 tsp. of sugar



ENERGY DRINK



19 tsp. of sugar

### HOW MUCH IS TOO MUCH?

Limit sugar to **5% of your daily caloric intake or 6 1/4 teaspoons.**

Registered dietitian at the University of Utah **Julie Metos** suggests, "Wean yourself to one sugary drink per week, then one per month. Soon you will beat the habit."

### THE (NON)-SUGAR-COATED TRUTH

Drinking **one 12-ounce can** of soda daily can result in gaining **15 pounds in a year.**



\*ONE TEASPOON OF SUGAR EQUALS 4 GRAMS.

### HEALTHY ALTERNATIVES

- » **Plain water not cutting it?** Add lemon, cucumber, watermelon or other fruit for flavor.
- » **Craving soda?** Opt for sparkling water.

healthfeed.uofuhealth.org



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# **Effective Communication**

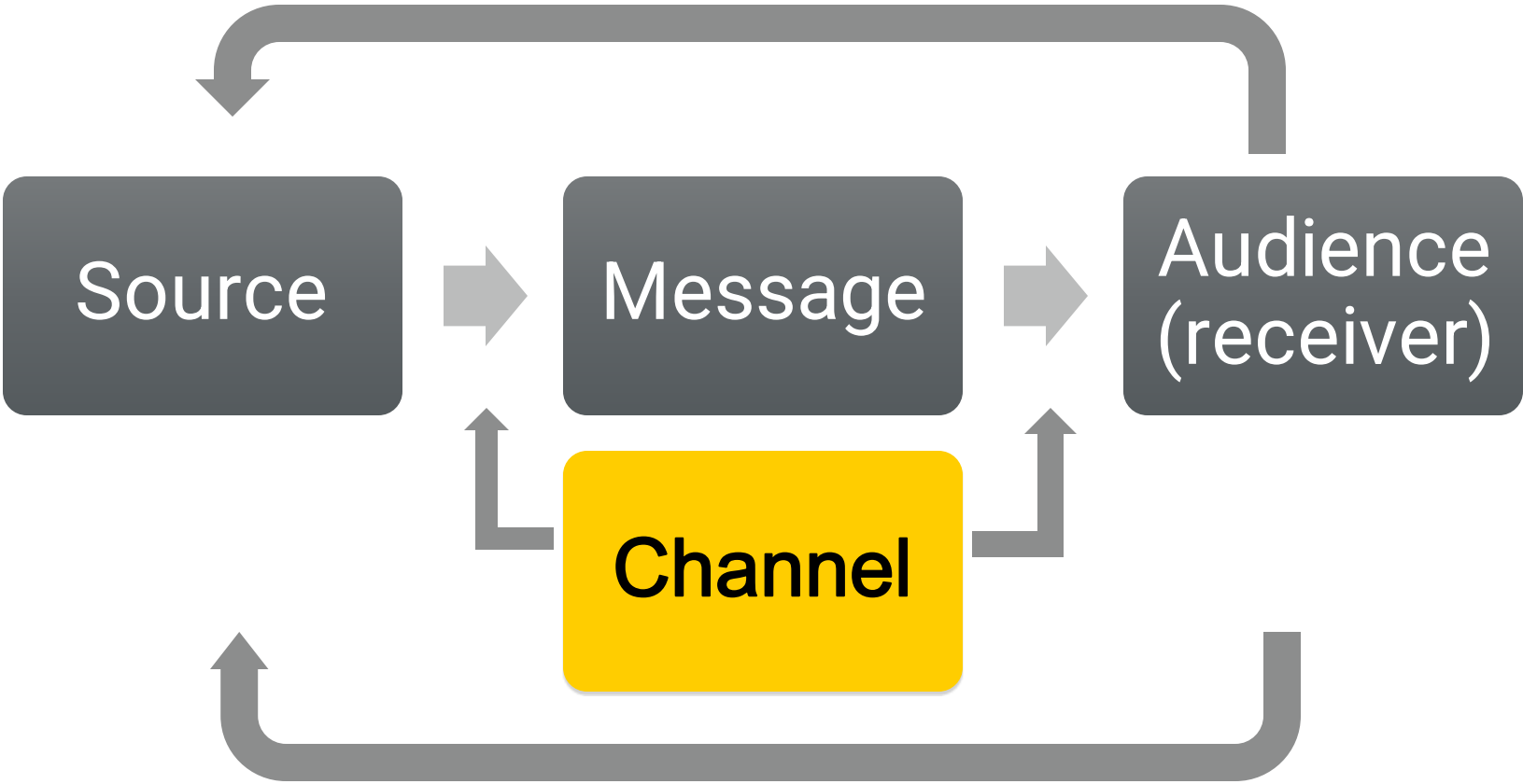
# 3 Questions to Ask

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- What is the **purpose** of this communication?
- **Who will use** the information?
- What are the **key messages** for this audience?

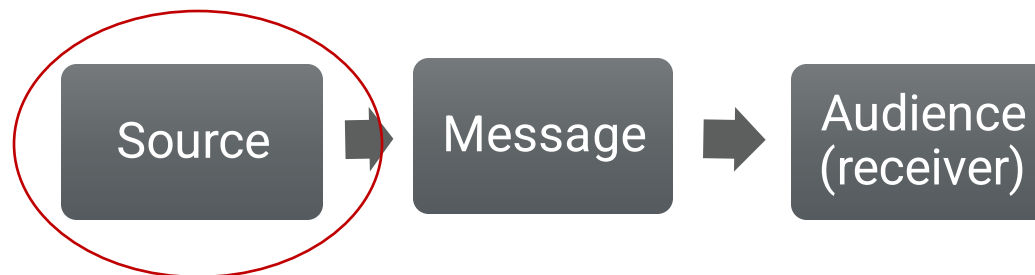


# Basic communication model





# SOURCE: The effective persuader



*Seen as*

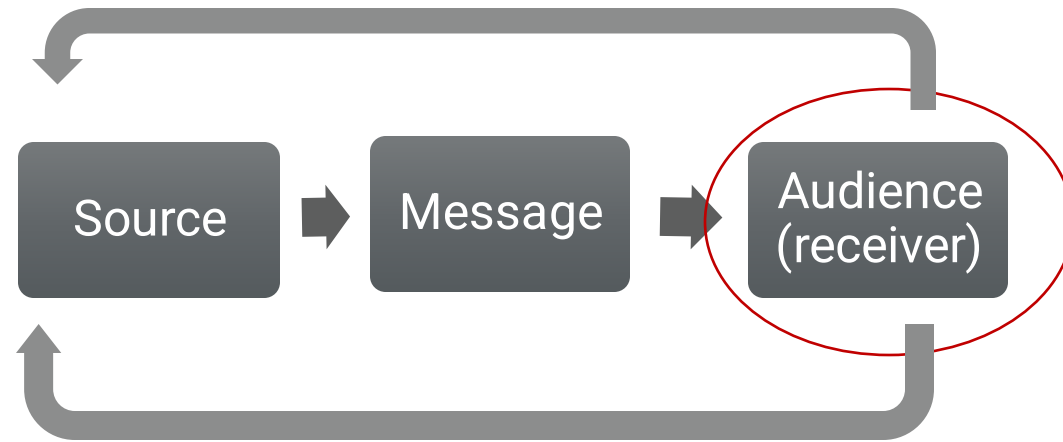
- Delivered by someone trusted
- Unbiased
- Relevant to constituent

Morshed AB, et al. Comparison of Research Framing Preferences and Information Use of State Legislators and Advocates Involved in Cancer Control, United States, 2012-2013. *Prev Chronic Dis.* Feb 02 2017;14:E10.





# AUDIENCE



Communicate  
for someone.....  
not about  
something.



# AUDIENCE:

## Who are you communicating with?

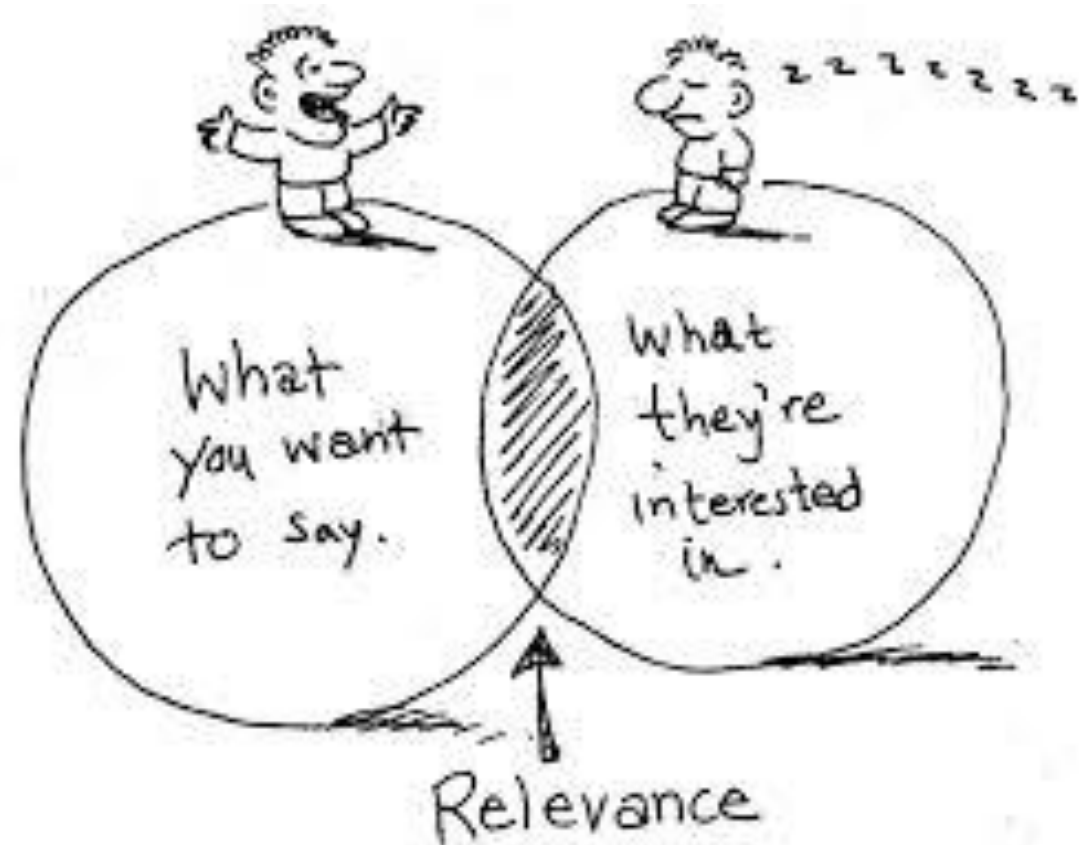
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- Elected Officials
- Legislative Staff
- Agency/Organization Leaders
- Community Groups
- Media
- Other?



# Connect with your audience

- Understand your audience/ their current position
- What do they care about?
- What are their information needs?
- Where, when and how do they seek information?
- Focus on interests, not positions



# Persuading your audience

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- The purpose for most communication in public health, but especially with decision makers, is persuasion.
- To persuade is to:
  - Create, strengthen, or change attitudes or behaviors



# MESSAGE

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Determine your *objectives*:

- What do you want your audience to **think/believe/know**?
- What do you want your audience to **feel**?
- What do you want your audience to **do**?



# MESSAGE: SOCO (Single Overriding Communication Objective)

The change you want to see in your audience as a result of this communication

One audience, one message, one issue

- Define your purpose:
  - We want **[audience]** to **[do what]** in order to **[benefit how]**
- Who is the *main* audience?
- What is the *call to action* (i.e., what you want them to do. Consider what is realistic and doable?)
- What is the *main benefit* of taking action?



# SOCO Example

<b>Issue</b>	Antimicrobial resistance (AMR) is increasing
<b>New information</b>	Lack of coordinated and comprehensive action to combat AMR has worsened the problem
<b>Change you want</b> <b>SOCO</b>	Comprehensive, coordinated action decreases AMR in next 5 years.



Image: <http://www.who.int/drugresistance/en/>

**NOT a SOCO: Resistance to antimicrobials of microbes that cause illness in humans is rapidly increasing**

<https://www.who.int/risk-communication/training/Module-D1.pdf?ua=1>





# Large Group Activity



1. Your target audience: Employers in your Community
2. What data points would be of interest to your target audience? Is there any additional information you would want to have?
3. What message do you want to convey to your target audience about the data? (Try and come up with a single sentence)

We want to make sure that people are eating at least one vegetable per day!

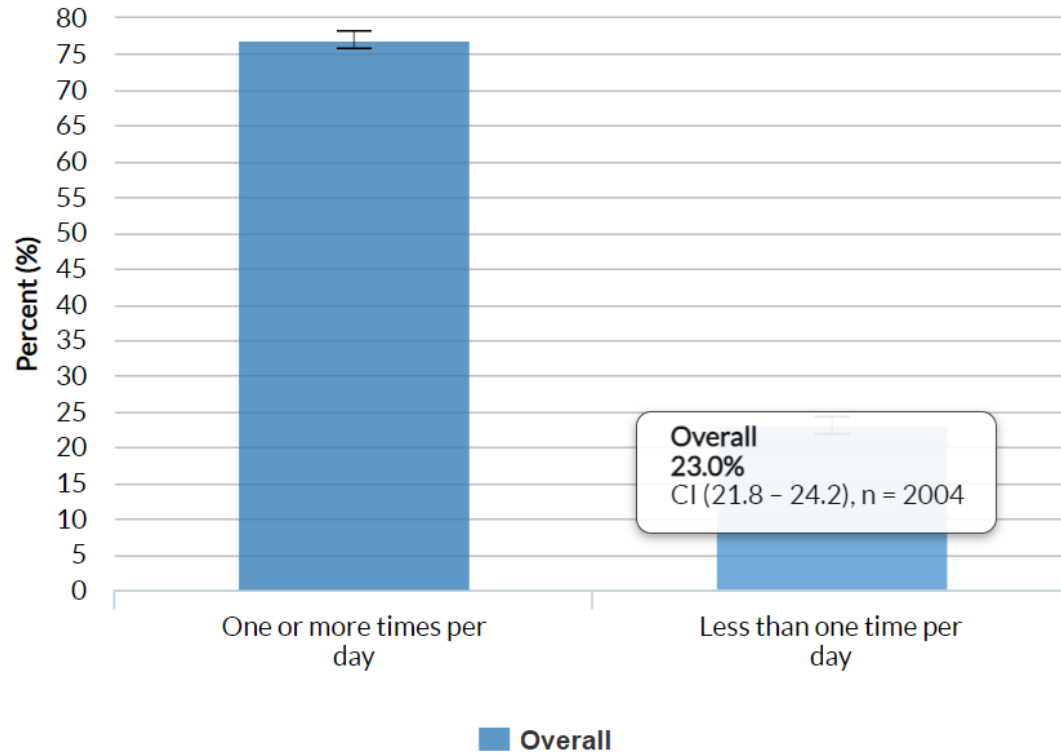


Iowa - 2021

Consumed vegetables less than one time per day (variable calculated from one or more BRFSS questions) (Crude Prevalence)

View by: Overall

Response: ( All )



Data Source: Behavioral Risk Factor Surveillance System (BRFSS)

Iowa - All available years

Consumed vegetables less than one time per day (variable calculated from one or more BRFSS questions) (Crude Prevalence)

View by: Overall

Response: ( All )

	One or more times per day	Less than one time per day
<b>2021</b>		
Percent (%)	77.0	23.0
95% CI	75.8 - 78.2	21.8 - 24.2
n	6546	2004
<b>2019</b>		
Percent (%)	77.3	22.7
95% CI	76.2 - 78.3	21.7 - 23.8
n	6805	1940
<b>2017</b>		
Percent (%)	80.7	19.3
95% CI	79.6 - 81.8	18.2 - 20.4
n	5682	1290

Data Source: Behavioral Risk Factor Surveillance System (BRFSS)



# Any Questions?

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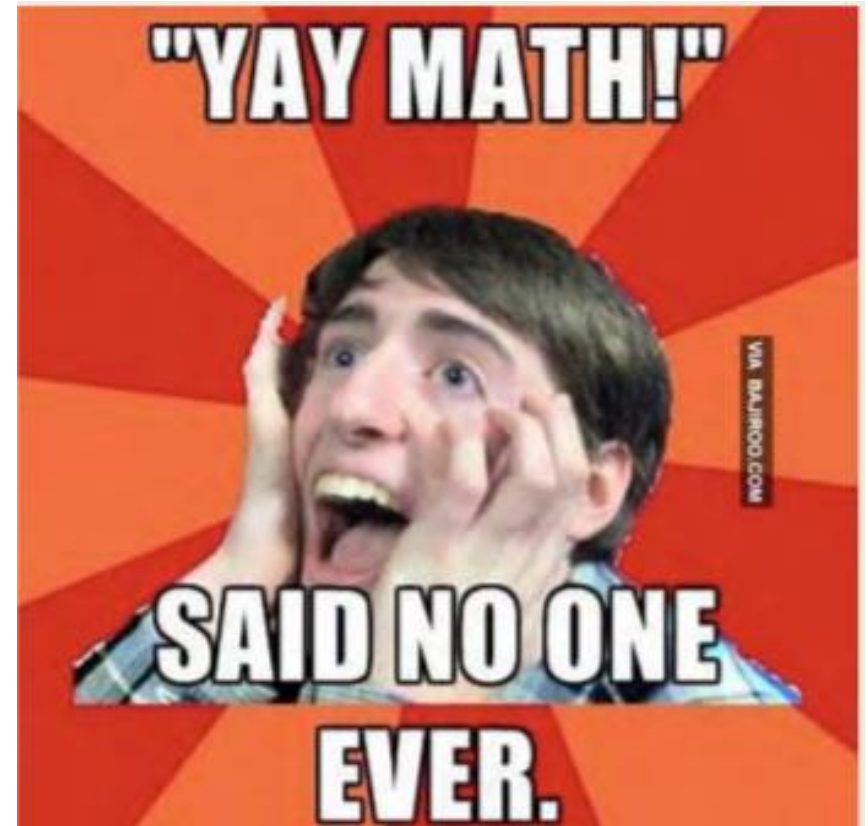
## **Module 2 – Part 2**

Using Social Math to Communicate Effectively

# Using Social Math

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- Social math makes large numbers comprehensible and relevant by placing them in a social context that is familiar to the audience.
- Social math is a way of telling a story!



# Effective Communication

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- Social Math examples

- A new study by the CDC found that each day an alarming number of young people join the ranks of regular smokers. The study estimated that 1.2 million young people under the age of 18 became daily smokers in 1996—that's more than 3,300 young people every day (the total of the graduating classes from 6 large high schools).
- Every 36 seconds, someone in America dies from heart disease or stroke
- The average person has 4000 weeks of life to achieve their goals and dreams. How will you make the most of them?



# A SNAPSHOT

# DIABETES IN THE UNITED STATES

## DIABETES

**37.3**  
MILLION

37.3 million  
people have  
diabetes



That's about 1 in every 10 people



1 IN 5

don't know  
they have  
diabetes

Centers for Disease Control and Prevention. National Diabetes Statistics Report. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2022.

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# Who are Iowa's children and youth with special health care needs?

~ **150,000** Iowa children & youth (**15%** of all 0-17 year olds)\*  
have special health care needs\*\* (CYSHCN).

- 50% are on public insurance
- ~36,000 are receiving, or are in need of care coordination

The number of CYSHCN in Iowa would fill Kinnick Stadium twice and still have overflow!

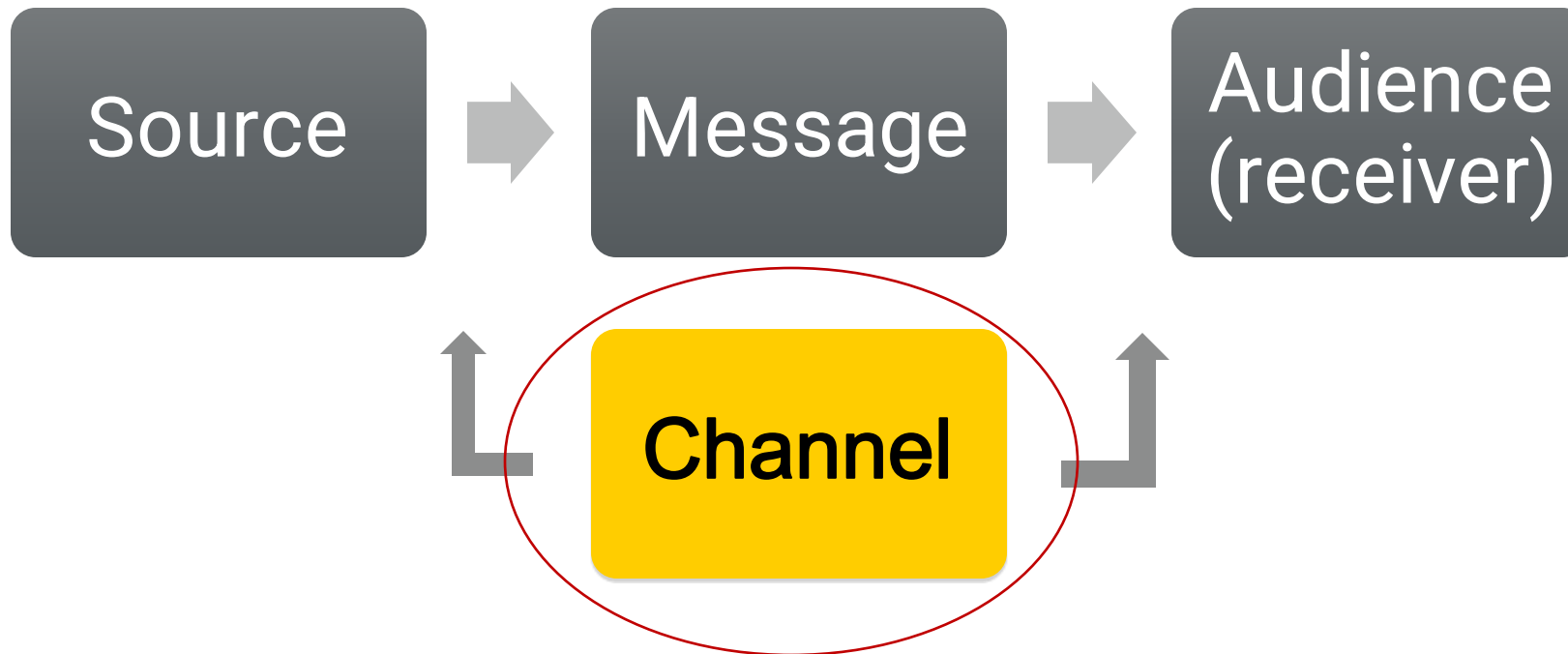


\* National Survey of Children with Special Health Care Needs 2011/2012 Report

\*\* MCHB defines CYSHCN as "have[ing] or are at increased risk for chronic, physical, developmental, behavioral, or emotional conditions and who require(s) health and related services of a type or amount beyond that required by children generally."



# What is the most effective channel (method) for reaching my audience?





# CHANNEL: Means of communication

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- Written (briefs, reports, infographics)
- Internet/email
- Social media, newspaper, television
- Face-to-face (with assistant, family member, physician as channels)
- Legislative testimony
  - 12% of state legislators say testimony is “very influential”
- Stories (may be embedded in any of these)  
*(The easiest may not be the most effective.)*

Moreland-Russell S, et al. "Hearing from all sides" How legislative testimony influences state level policy-makers in the United States. *Int J Health Policy Manag.* Feb 2015;4(2):91-98



# How do I decide what data point(s) to use?

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- Should I use a Rate? Percentage? Count?
- Should I show disaggregated data? A trend over time?
- You have to know what data you have available, what tells the story best, and what will be most relevant to your audience.



# When would I use graphics to present my data?

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- When you can simplify your data into a couple/few bite size pieces
- When you have limited space/time and want to quickly show the scope of a problem
- When you want to tell a story and you've already gotten their attention!

Check out our Visualize This training!

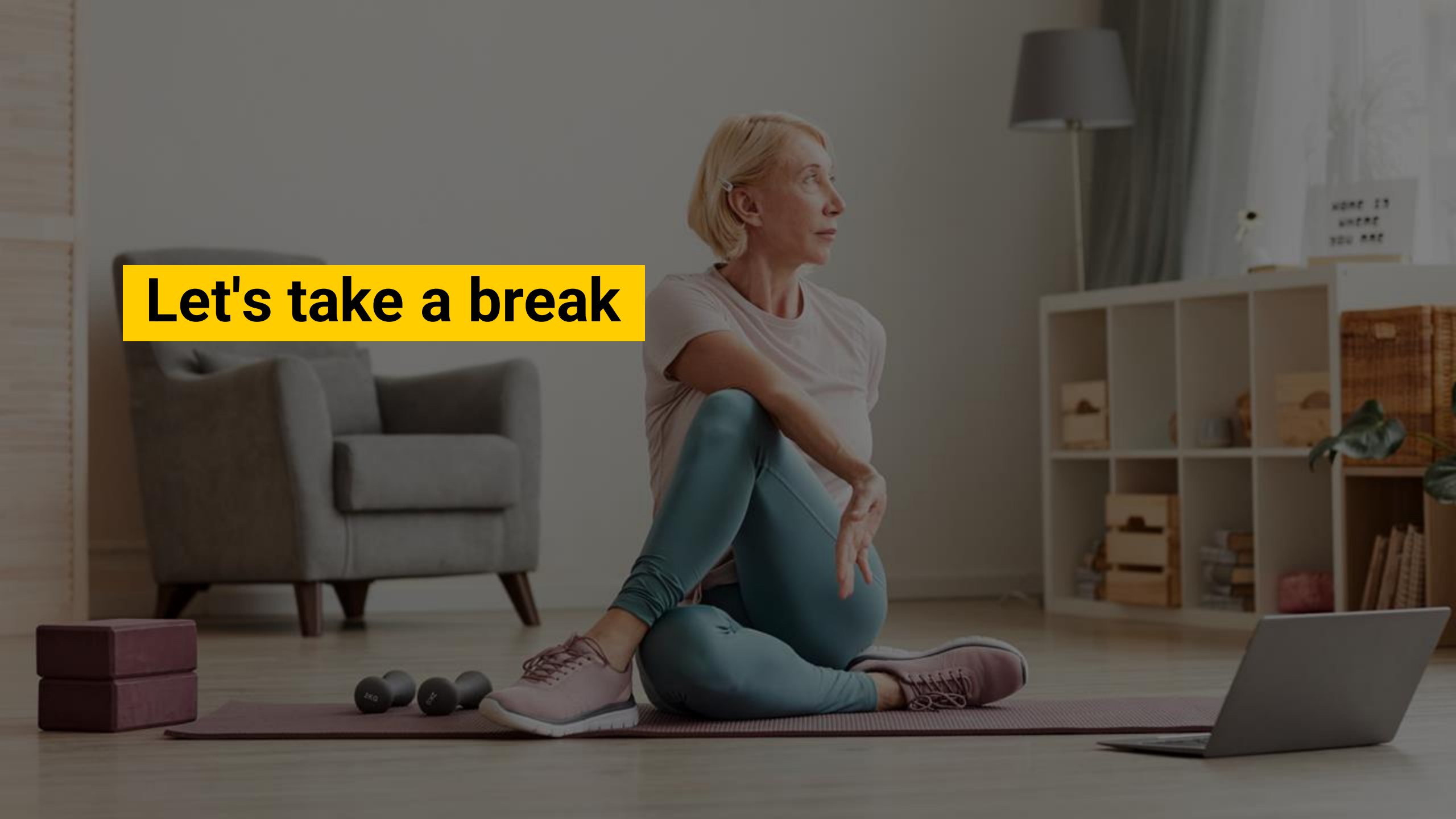


# Any Questions?

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**Let's take a break**



# Module 3

Using a “Bite, Snack, Meal” Approach to Communicating Data

# Bite, Snack, Meal

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- A method for providing data to a variety of audiences. Some will want just a small piece of information, some will want to know more, and some will want as much information as possible about the topic.
- **Bite:** A headline with a message
- **Snack:** A concise summary that provides enough information for a content overview
- **Meal:** The full array of information you want to provide



# Bite: Safe Sleep

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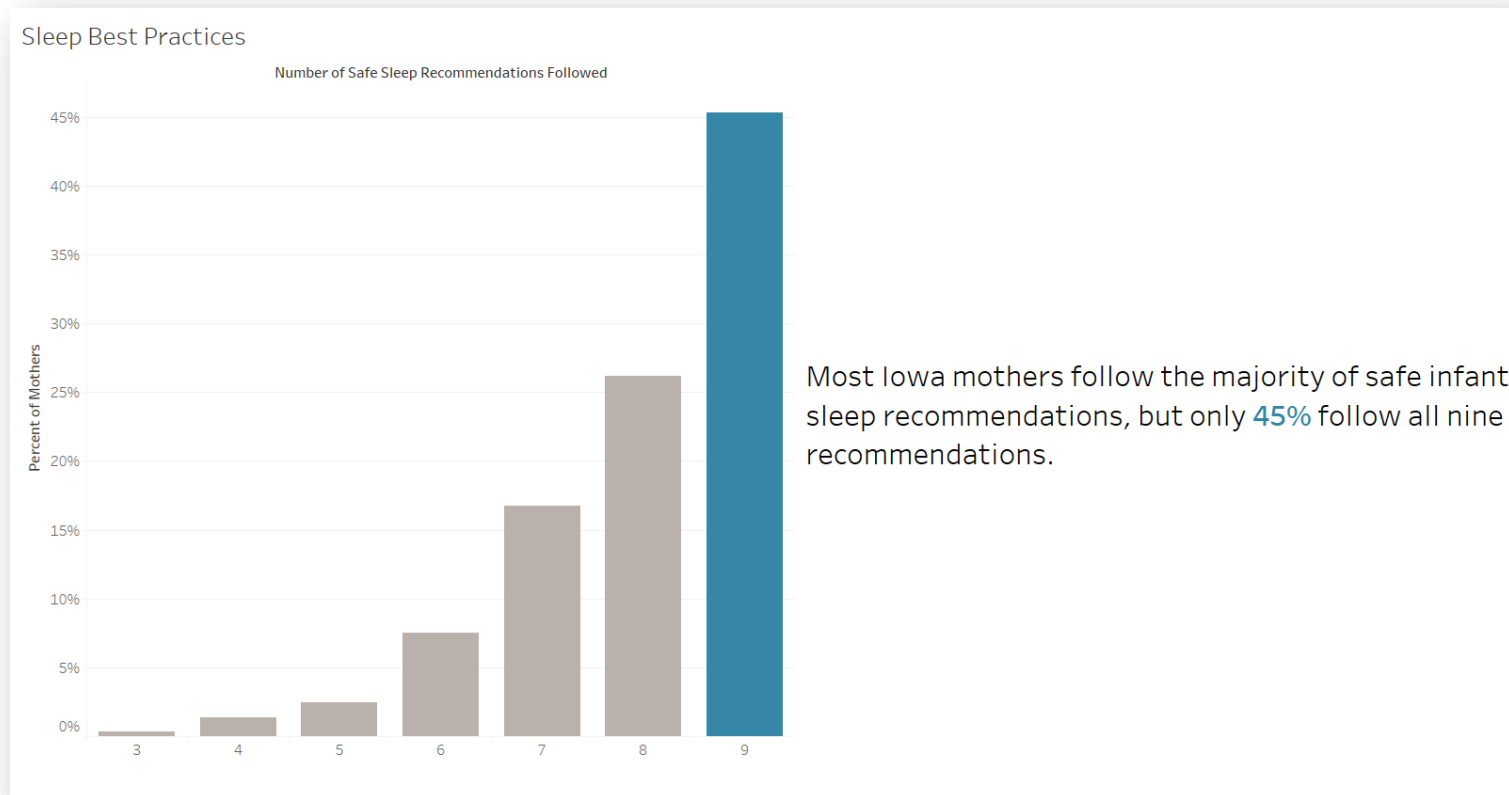
86% of Iowa mothers put their infants to sleep exclusively on their backs, as recommended.

Source: Iowa Department of Public Health,  
Pregnancy Risk Assessment Monitoring System,  
2014





# Snack: Safe Sleep



# Meal: Safe Sleep



# Any Questions?

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# Tips for Working in Small Groups

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- Turn on cameras
- Identify:
  - One person to share the data on their screen
  - One person to take notes
  - One person to share with the large group

*Note: One person can hold multiple roles if your group is small!*
- Participation is key, utilize this as an opportunity to engage and learn with your peers
- There are no "right" answers
- Use the "Help" button if you get stuck





A group of people in a meeting room, seen from behind, with several individuals raising their hands. The scene is brightly lit, suggesting a professional or educational setting. A yellow banner with the word "Debrief" is overlaid on the image.

**Debrief**

# Last thoughts about Data in Public Health

- There is no perfect dataset.
- Use the data to learn about your community/issue (be curious, ask questions)
- You may have to collect some data
- Focus on public health practice—don't let the perfect be the enemy of the good (Voltaire)
- The community should be at the table at all phases of the data life cycle--collection, analysis, interpretation and communication.
- Incorporate equity in your data life cycle (Check out our Disaggregate It training)



# Data Training Opportunities

Data Basics

Tackling Data

Visualize This

Disaggregate It

Check out our website  
to see upcoming  
training dates!



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# Resources

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- NCI: Making Data Talk: A Workbook  
<https://www.cancer.gov/publications/health-communication/making-data-talk.pdf>
- Using Graphics to Report Evaluation Results  
<http://learningstore.uwex.edu/assets/pdfs/G3658-13.PDF>
- Yocco and Pulli, Social Math: A method to make complex data meaningful, 2016
- Public Health Reaching Across Sectors (PHRASES) toolkits <https://www.phrases.org/>
- WHO Risk Communication training  
<https://www.who.int/risk-communication/training/Module-D1.pdf?ua=1>



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**Thank you!**

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