



National American Indian & Alaska Native

**PTTC**

Prevention Technology Transfer Center Network  
Funded by Substance Abuse and Mental Health Services Administration

**IOWA**

**SAMHSA**  
Substance Abuse and Mental Health  
Services Administration

# The 5 C's (not D's) of Data

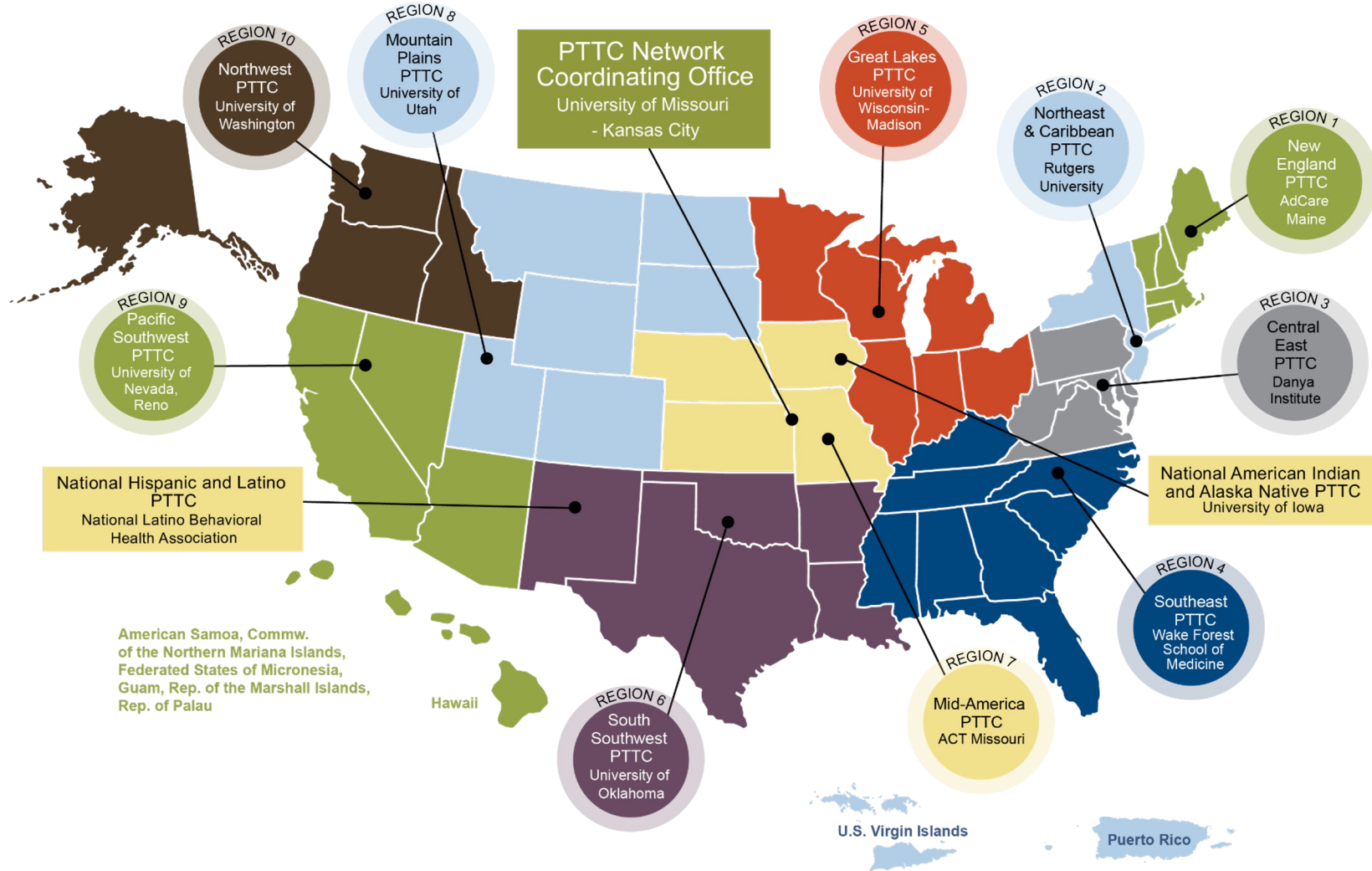
## August 18, 2022



PTTC

Prevention Technology Transfer Center Network  
Funded by Substance Abuse and Mental Health Services Administration

PTTC Network



# American Indian & Alaska Native Prevention Technology Transfer Center

This webinar is provided by the National American Indian & Alaska Native PTTC, a program funded by the Substance Abuse and Mental Health Services Administration (SAMHSA).



Substance Abuse and Mental Health  
Services Administration

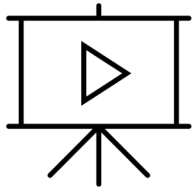
The National American Indian and Alaska Native Mental Health Technology Transfer Center is supported by a grant from the Substance Abuse and Mental Health Services Administration (SAMHSA).

The content of this event is the creation of the presenter(s), and the opinions expressed do not necessarily reflect the views or policies of SAMHSA, HHS, or the American Indian & Alaska Native PTTC.

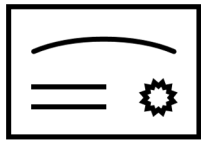


# Follow-up

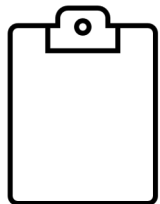
Following today's event, you will receive a follow up email, which will include:



Links to the presentation slides and recording, if applicable



Information about how to request and receive CEUs



Link to our evaluation survey (GPRA)

# Land Acknowledgement

We would like to take this time to acknowledge the land and pay respect to the Indigenous Nations whose homelands were forcibly taken over and inhabited.

Past and present, we want to honor the land itself and the people who have stewarded it throughout the generations.

This calls us to commit to forever learn how to be better stewards of these lands through action, advocacy, support, and education.

We acknowledge the painful history of genocide and forced occupation of Native American territories, and we respect the many diverse indigenous people connected to this land on which we gather from time immemorial.

While injustices are still being committed against Indigenous people on Turtle Island, today we say thank you to those that stand with Indigenous peoples and acknowledge that land reparations must be made to allow healing for our Indigenous peoples and to mother earth, herself.

Dekibaota, Elleh Driscoll, Meskwaki and Winnebago Nations

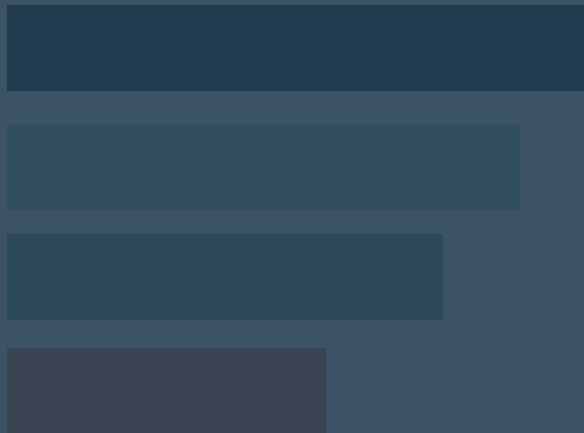
Ttakimaweakwe, Keely Driscoll, Meskwaki and Winnebago Nations

Ki-o-kuk, Sean A. Bear, 1<sup>st</sup>. Meskwaki

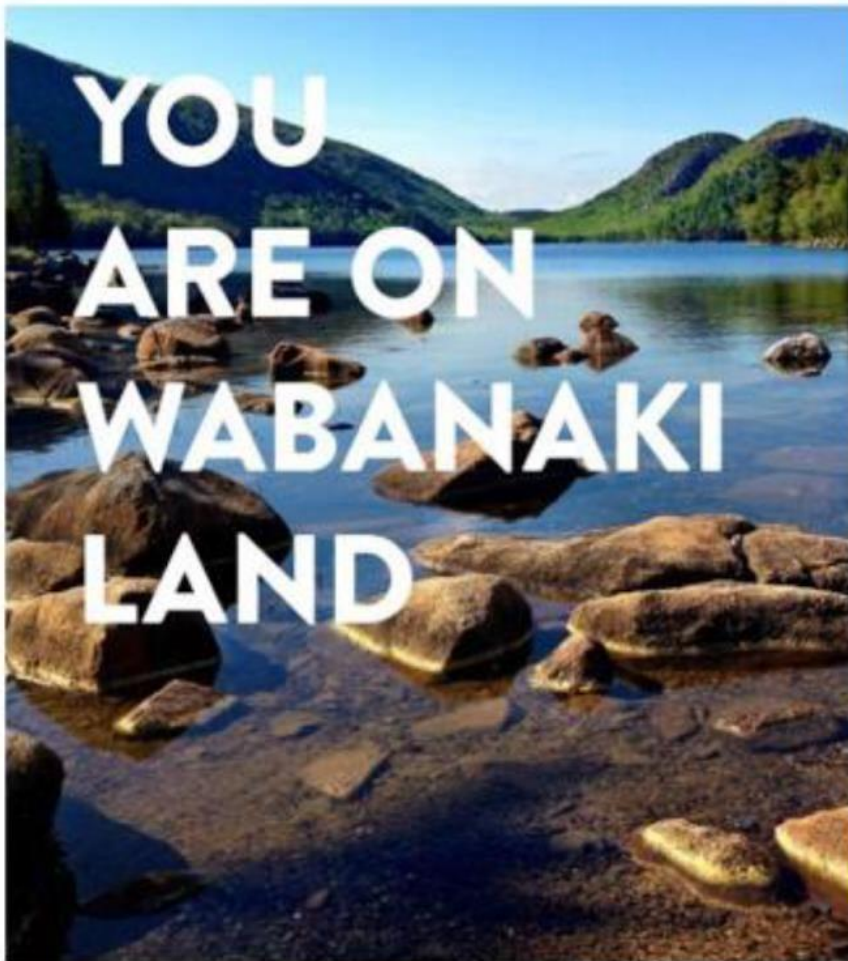


# The Five C's (not D's) of Data

Jamie Comstock  
& Robin Carr



INFO INSPIRED



As we gather in this place, we want to acknowledge that we are occupying the traditional territory and ancestral lands of the Wabanaki people, who for thousands of years have called this place home. We acknowledge their continued connection to this land, give thanks for allowing us to do this good work on their homeland, and remember their ancestors who were here before us.

Written by:  
Denise Altvater, Passamaquoddy Tribe at Sipayik



A photograph of a pond with a pink lotus flower in the foreground. The flower is in full bloom, showing many pink petals and a yellow center. It is surrounded by large green lily pads and some brown, dried leaves. The water is dark and reflects the flower and the surrounding foliage. A semi-transparent white banner is overlaid across the middle of the image, containing the text "Welcome and Opening".

# Welcome and Opening





mattsurelee



Follow

1,628 posts

400k followers

308 following

Matt Shirley

I try to make a chart every day 📊

Email me things: mattsurelee@gmail.com

I wrote a book 📖

[www.runningpress.com/titles/matt-shirley/a-visual-learners-guide-to-being-a-gro...](http://www.runningpress.com/titles/matt-shirley/a-visual-learners-guide-to-being-a-gro...)

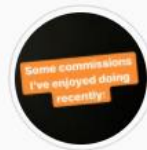
Book Q an...



Q and A #3



My subreddit



Commissions



SportsCharts



Q and A #3

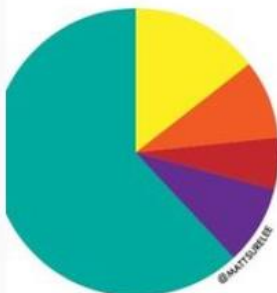


Friday

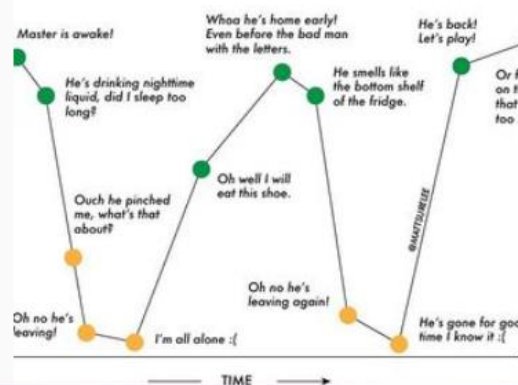
POSTS

TAGGED

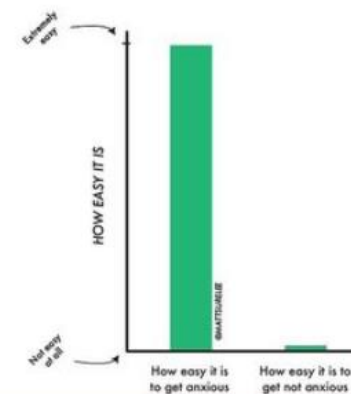
## MARCH MADNESS



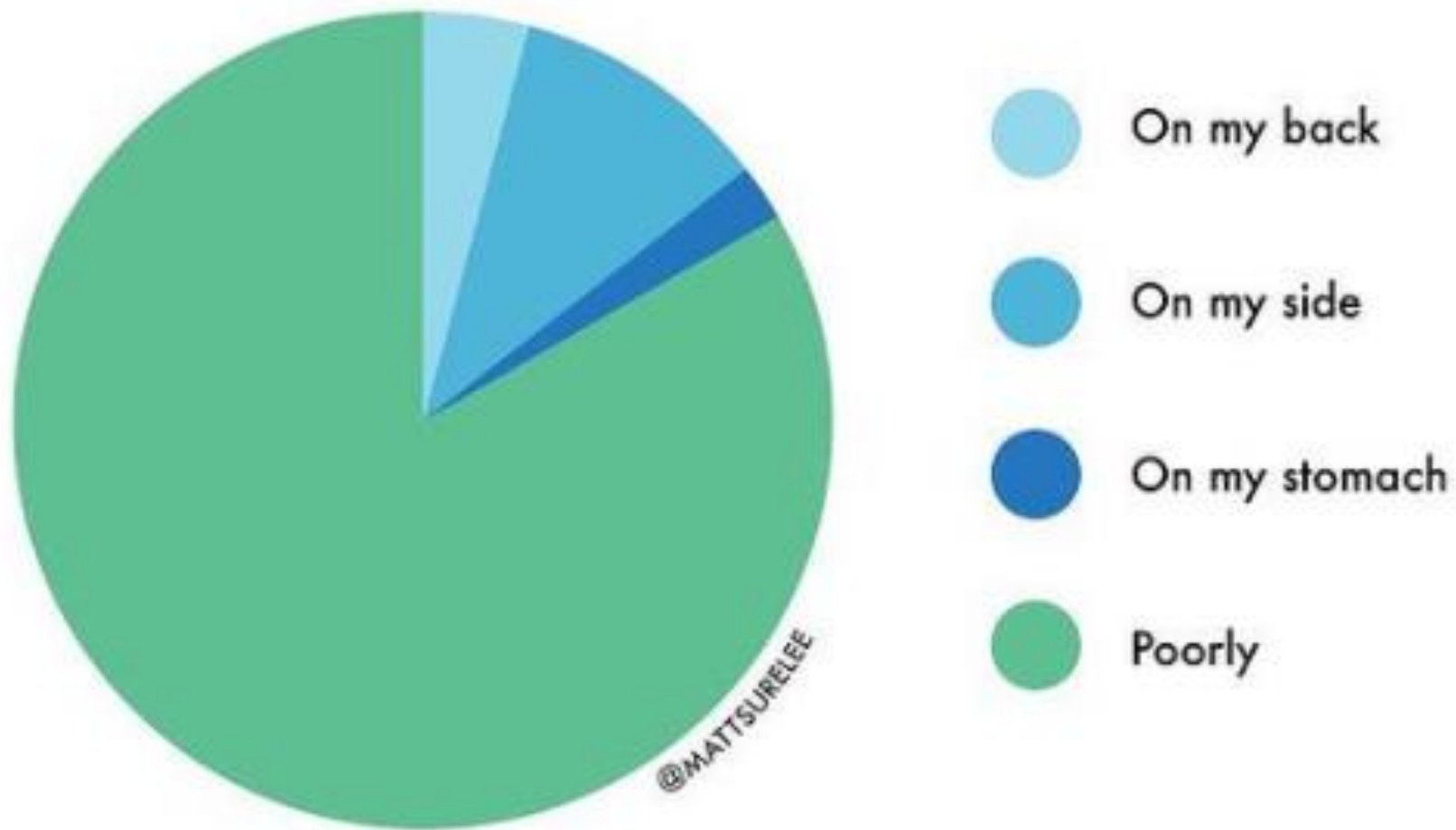
- Intense action
- Incredible buzzer-beat
- Heartwarming stories
- Heartbreaking finishes
- Me losing money

SAINT PATRICK'S DAY  
(FROM YOUR DOG'S POINT OF VIEW)

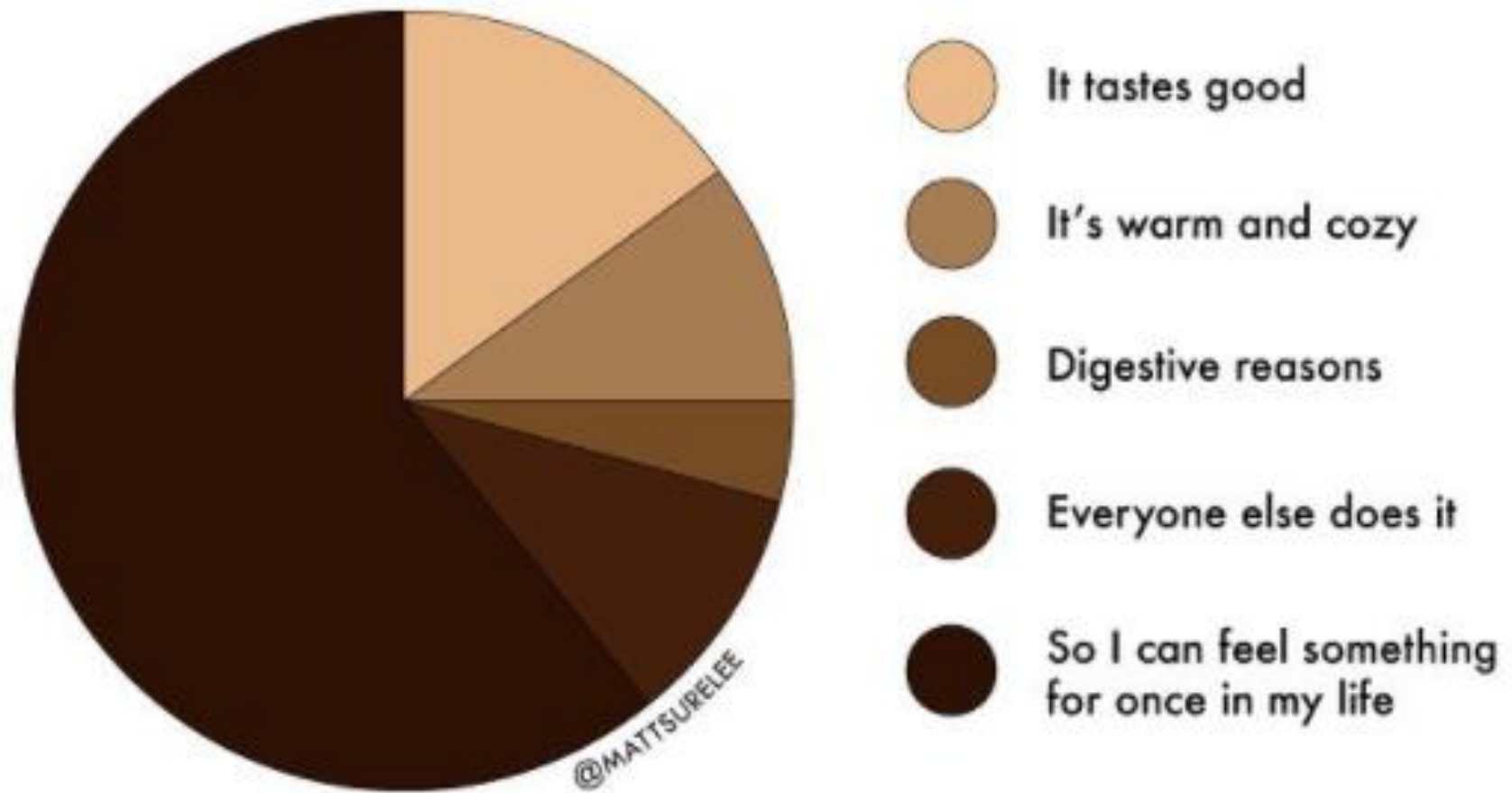
## ANXIETY



# HOW I SLEEP



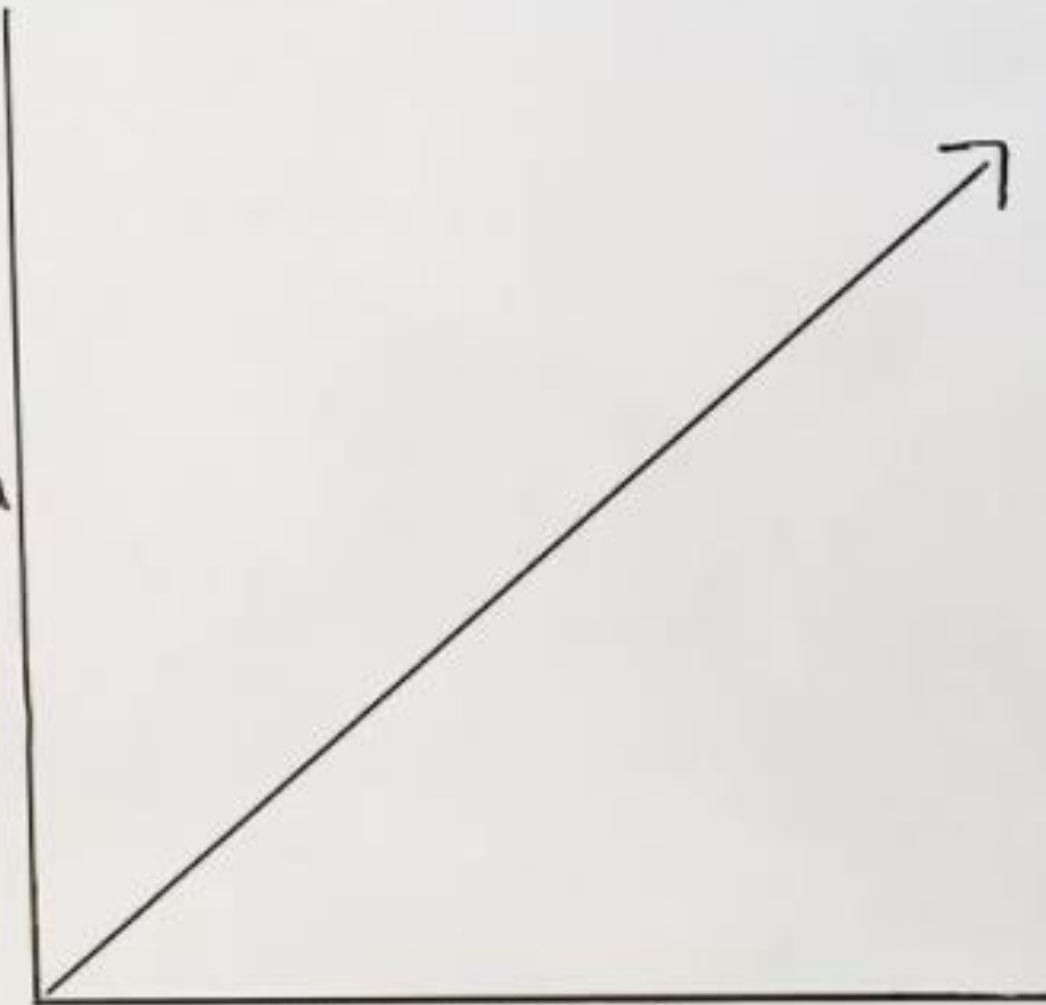
# WHY I DRINK COFFEE







HOW  
CORRECTLY  
YOU HOLD  
THE STEERING  
WHEEL



HOW BAD A  
DRIVER YOU ARE

@mattsureke

# WHEN CHILDREN LACK NUTRITION

This is childhood malnutrition at life-size: Each of these children is severely malnourished—and the red circle around each photo equals the circumference of that child's arm. The circle is much larger if a child is not malnourished, as the key below shows.

Despite some gains against global hunger, malnutrition in children under age five left 22.2 percent of them stunted (too short for their age) and 7.5 percent of them wasted (too thin for their height) in 2017. UNICEF's Diane Holland says catching acute malnutrition early is key to bringing children back to healthy growth. The "MUAC bracelet" (right), used to measure mid-upper-arm circumference, helps gauge the severity of acute malnutrition so a child can be given lifesaving treatment and care.

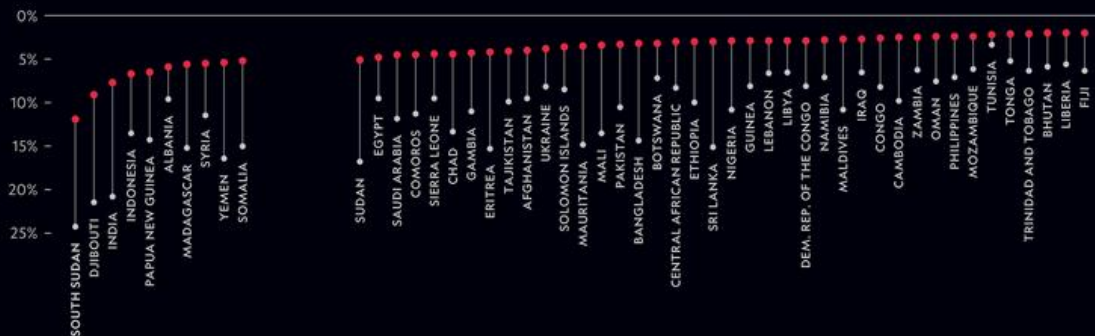
## MUAC (MID-UPPER-ARM CIRCUMFERENCE)



## HUNGRIEST COUNTRIES

Food scarcity and malnutrition span the globe. Of the 50 countries with the highest percentage of children under age five suffering from malnutrition, more than half are in Africa.

- % WITH SEVERE WASTING
- % WITH SEVERE AND MODERATE WASTING



8.7 cm  
(MUAC circle in life-size)  
East Ghouta  
SYRIA, 2017

Under siege since 2013, this outer district of the country's capital is a focal point of the civil war. Humanitarian groups are unable to regularly access the nearly 400,000 people who live there.



9.0 cm  
Juba  
SOUTH SUDAN, 2017

This two-year-old child was given a weekly food-aid supply after being diagnosed with severe malnutrition. The country has been mired in a devastating civil war for more than four years.



10.0 cm  
Chelhar  
PAKISTAN, 2015

Extreme heat in summer, food scarcity, unsafe drinking water, and lack of access to health facilities in rural Pakistan cause high rates of malnutrition among children, including this seven-month-old.



10.5 cm  
Dhamar  
YEMEN, 2017

In the Middle East's poorest country, some 2.2 million children under age five are malnourished. As a result of the civil war, more than half the nation's medical facilities no longer operate.



10.9 cm  
Muna Garage IDP camp  
NIGERIA, 2016

Roughly 250,000 of Borno state's children face severe malnourishment as a result of the Boko Haram conflict. Widespread displacement has separated some 20,000 children from their parents.



11.0 cm  
Moinerghona refugee camp  
BANGLADESH, 2017

Since August 2017, more than 700,000 Rohingya refugees have fled on foot to Bangladesh to escape violence. This 10-month-old's family left Myanmar after the country's military set fire to their village.

Cut the bracelet along the dotted lines, and insert the bottom end into the horizontal slit to understand how MUAC bracelets are used.

FIGURES FOR CHILDREN 6-59 MONTHS



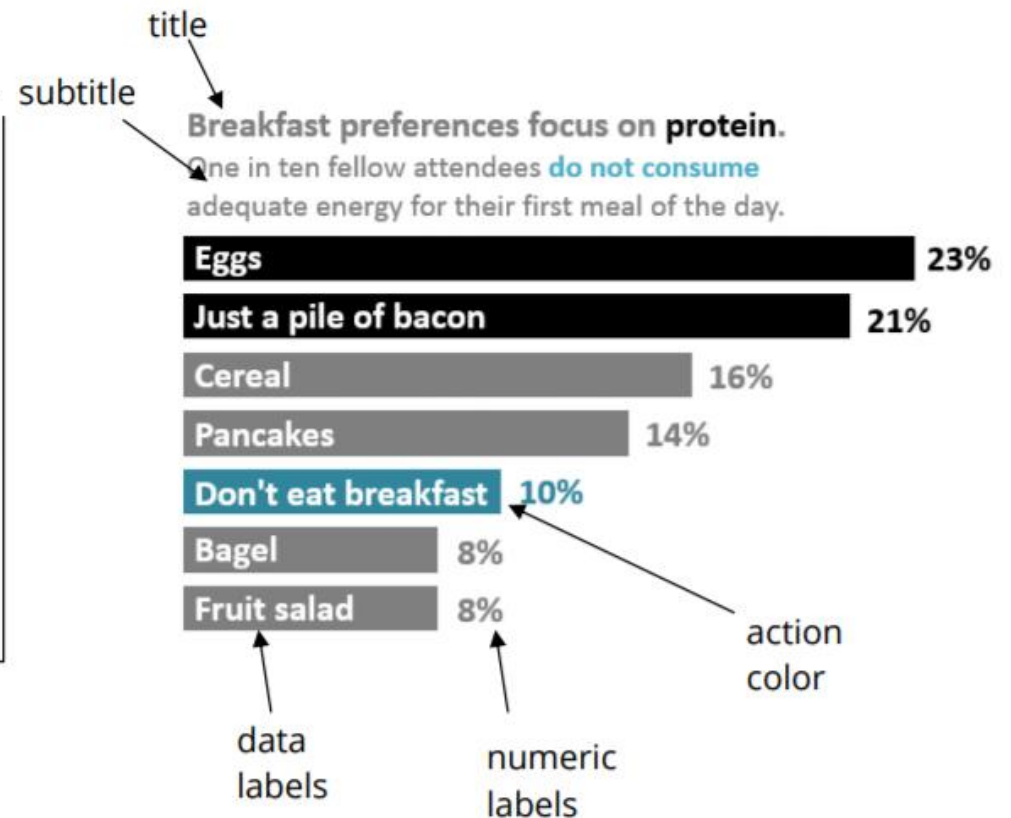
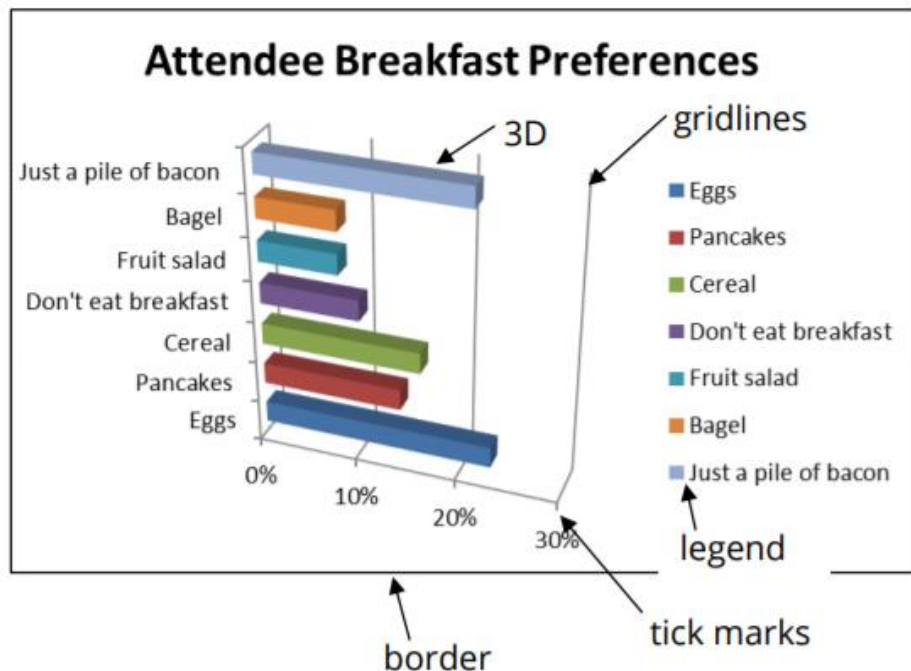
# Why do it differently?



**We want the audience  
to understand the data we share.**

# A Before and After Transformation...

## and some terminology



Stephanie Evergreen



# Types of Data



and



**Quantitative**  
How many/often  
(the numbers)

**Qualitative**  
Why/when  
what it means



Asking the following questions can help you decide what data to include in your presentation versus what might be better suited for a handout or left out altogether.

What are the conclusions that can be drawn about the data?

What's compelling about this information?

Are there trends to show?

Are there comparisons you'd like to demonstrate?

Is there anything surprising or unexpected to share?

# 5 C's of Data

A guide to communicating data visually so that insights can be quickly and easily understood.

**#1 - Chart Choice**

**#2 - Composition**

**#3 - Color**

**#4 - Context**

**#5 - Clutter**

# Chart Choice



**vs.**





# Datavizproject.com

← → ↻ datavizproject.com/# ☆ 🔍 ⌵ G

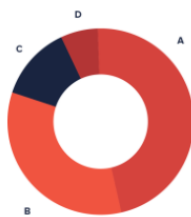


ALL FAMILY ▾ INPUT ▾ FUNCTION ▾ SHAPE ▾ 🔍 ⓘ

by **ferdio**

Comparison Concept visualisation Correlation Distribution Geographical data **Part to whole** Trend over time

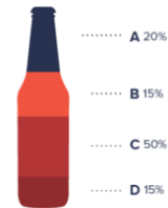
Donut Chart



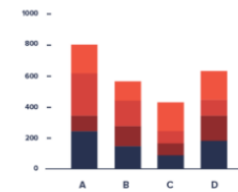
Pictorial fraction chart



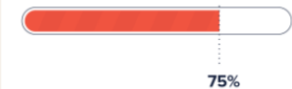
Pictorial Stacked Chart



Stacked Bar Chart



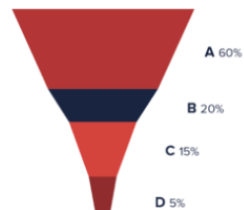
Progress Bar



Pictorial Fraction Chart



Funnel Chart



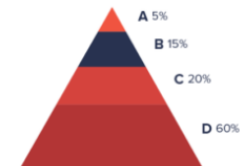
Bullet Graph



Solid Gauge Chart

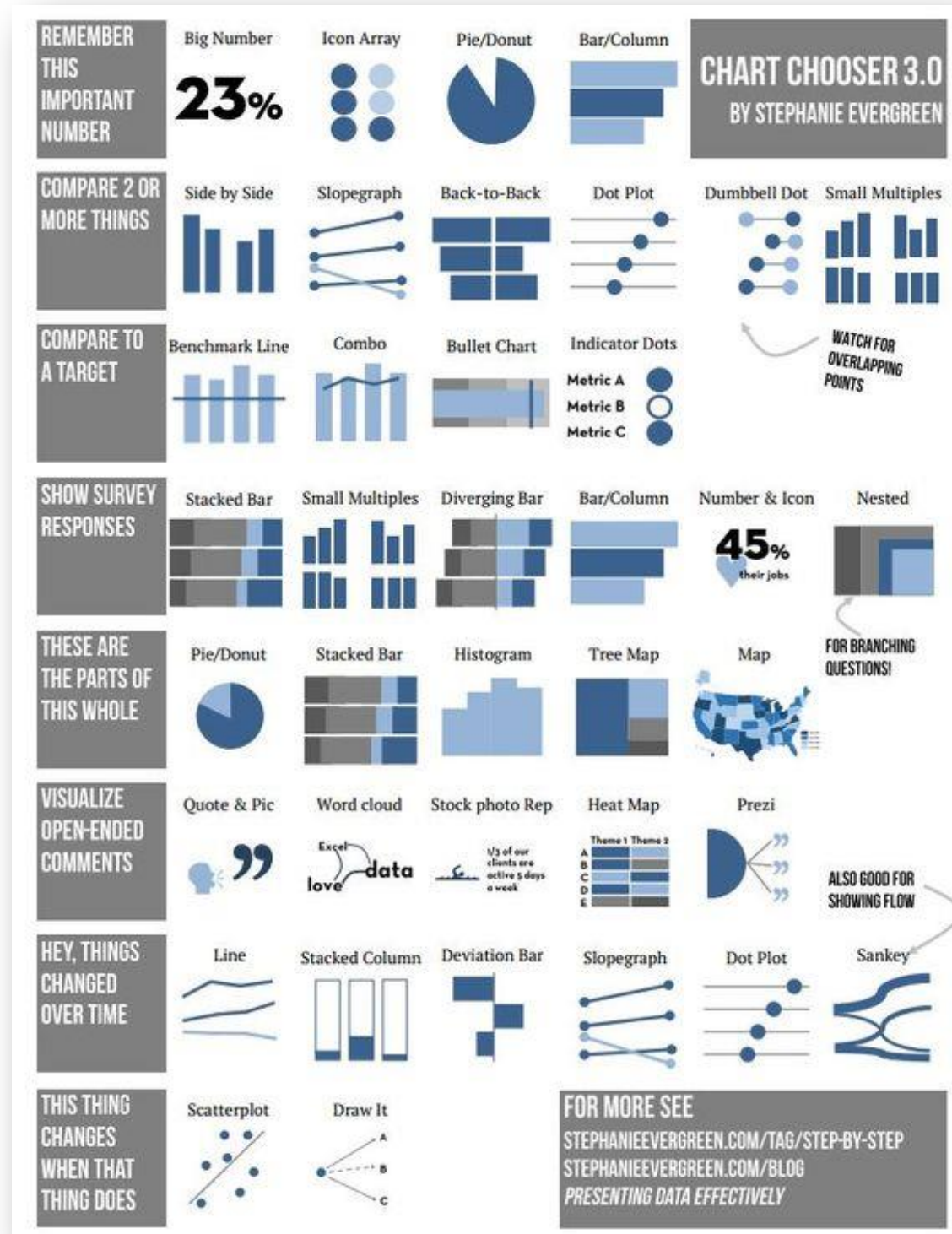


Pyramid Chart

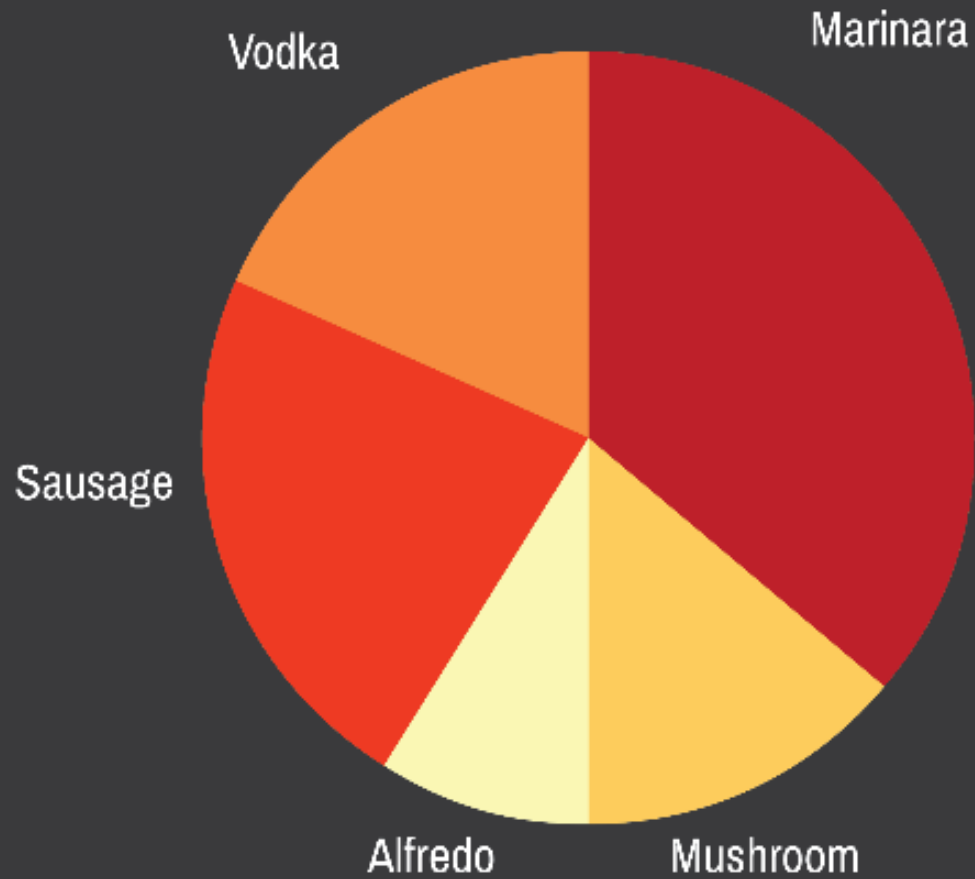


# Chart Chooser

Stephanie  
Evergreen

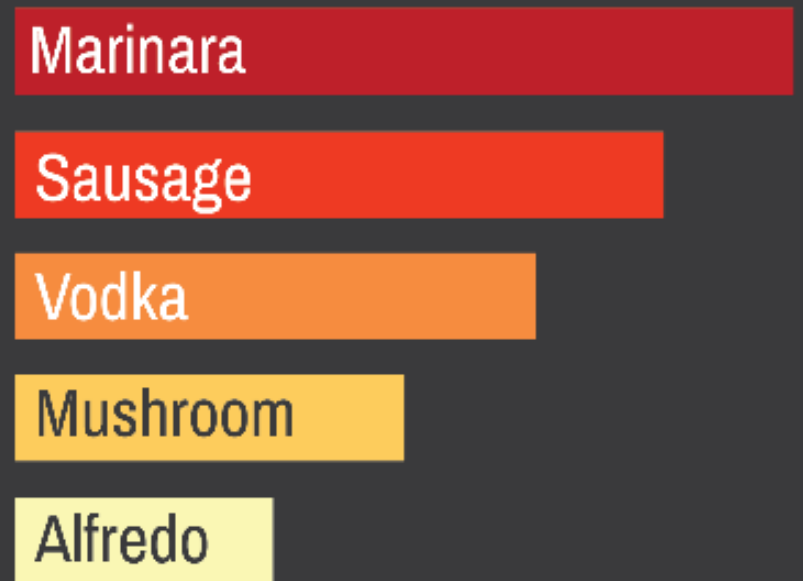


# Most Popular Pasta Sauces



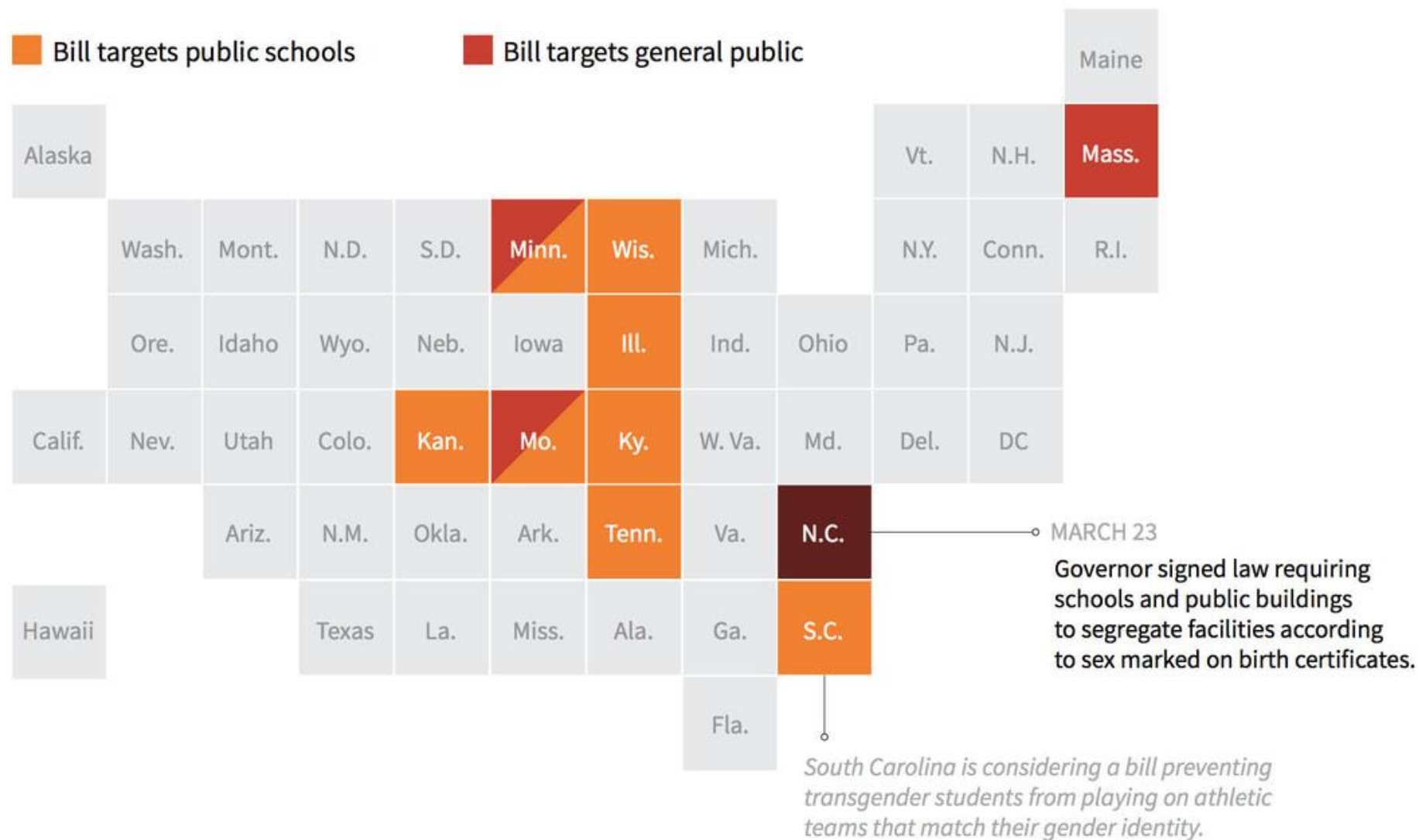
Pie Chart

vs.

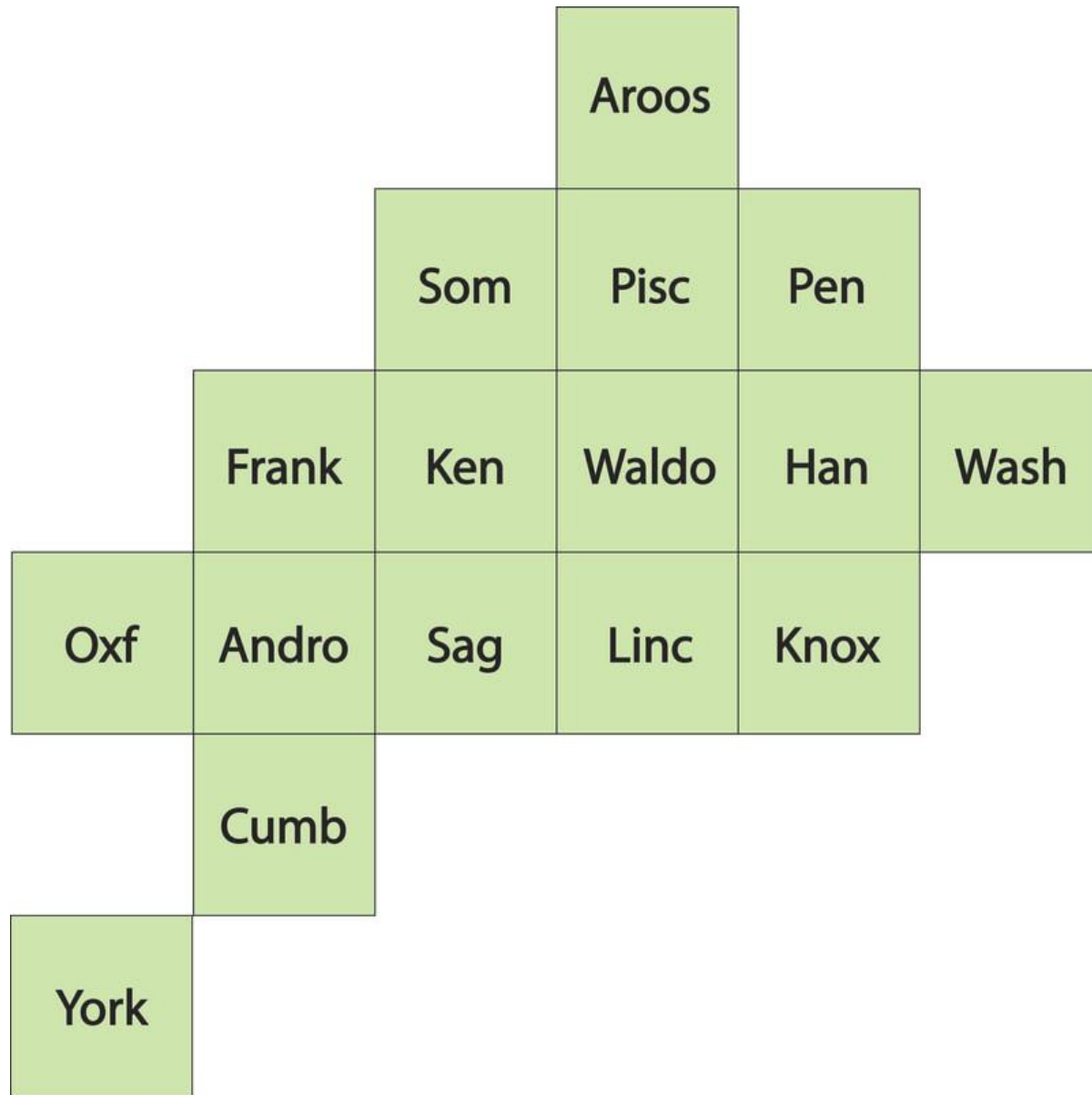


Bar Chart

## States with bills currently active in state legislatures that mandate people use sex-segregated facilities according to sex assigned at birth rather than gender identity

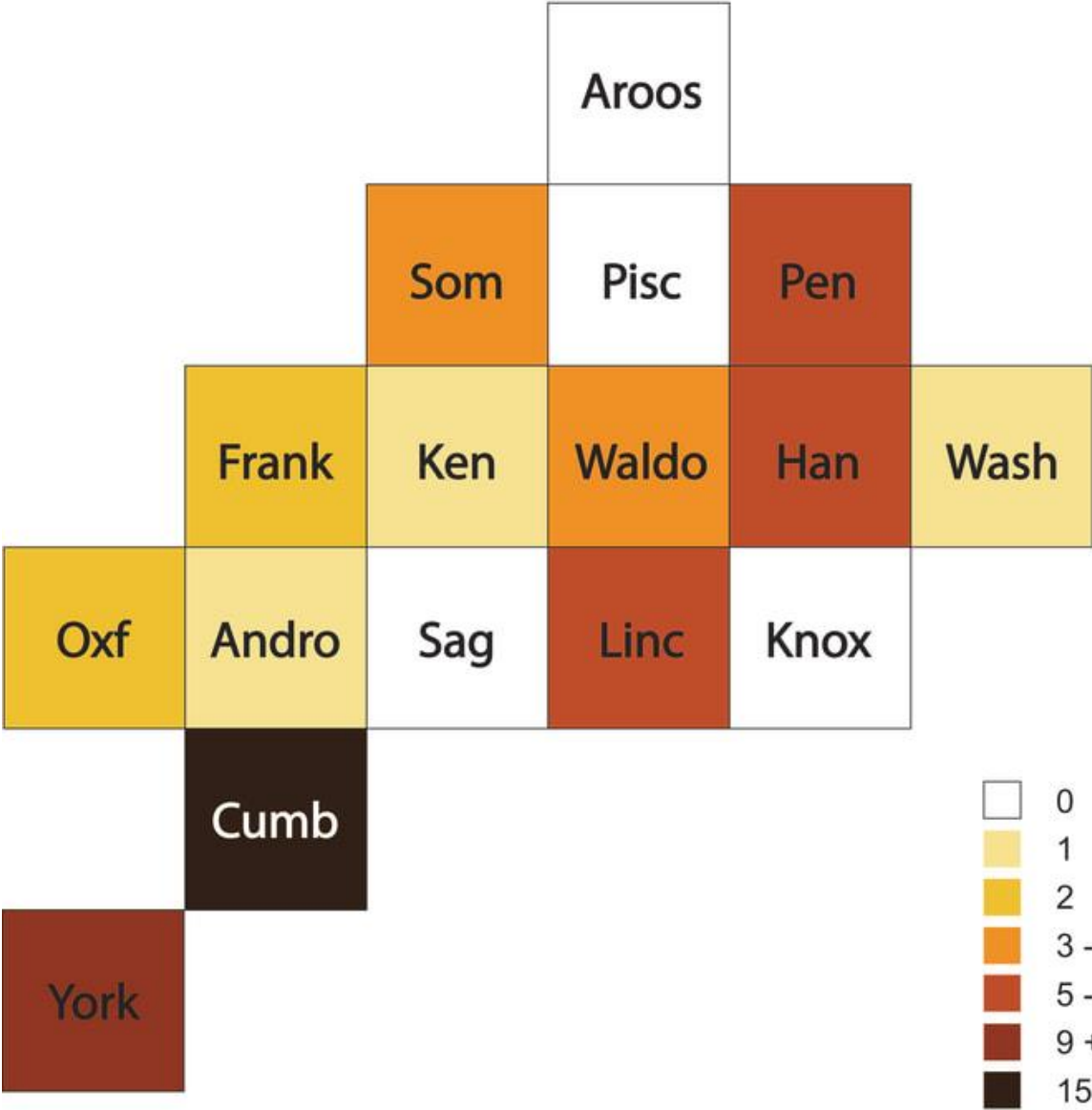








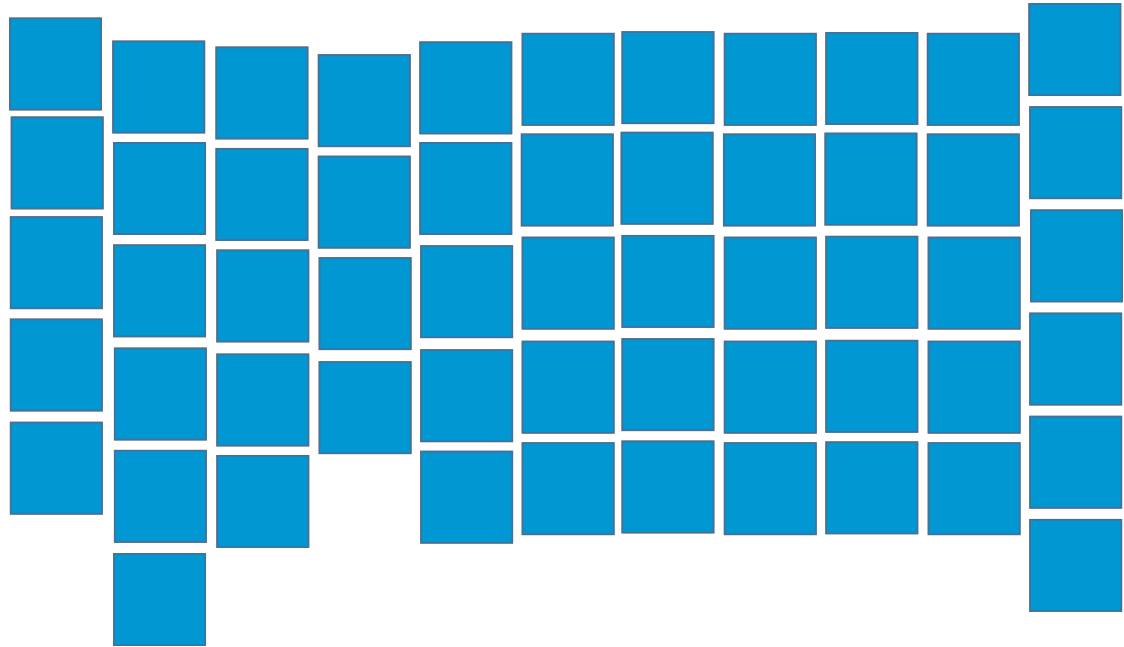
Number of Maine Microbreweries and Brewpubs  
by County



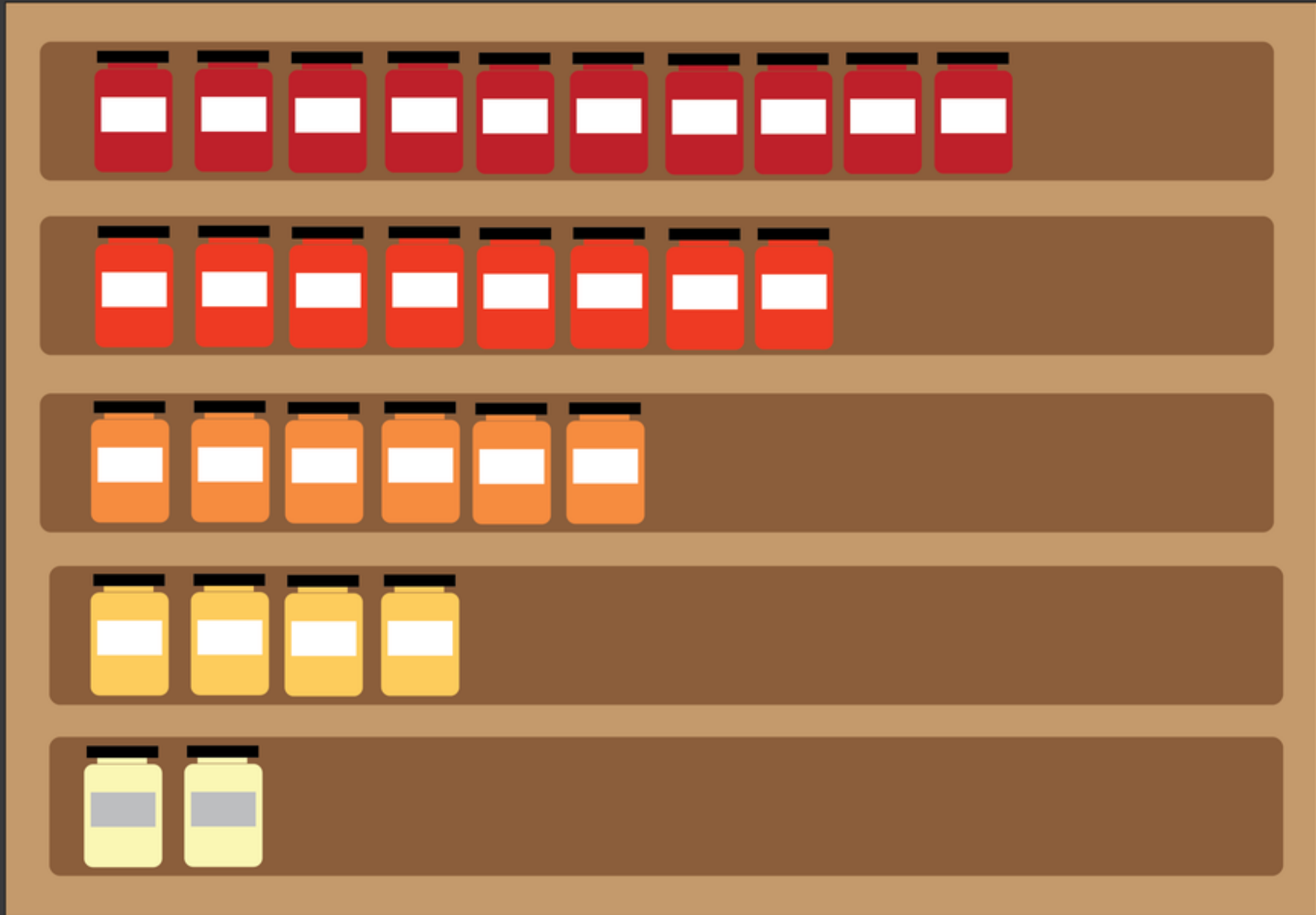
# Maryland



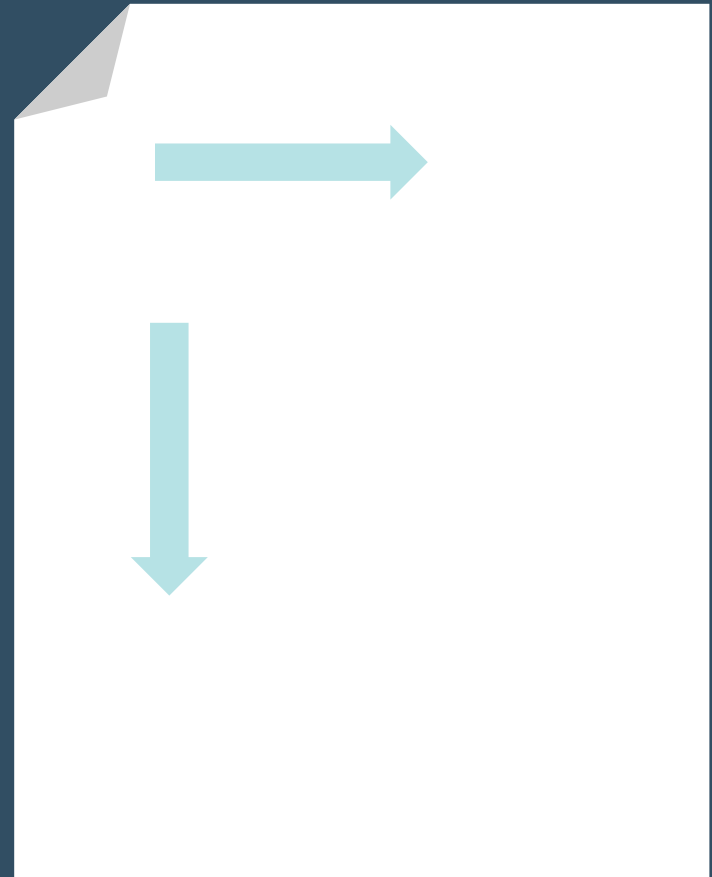
# Montana



# Most Popular Pasta Sauces

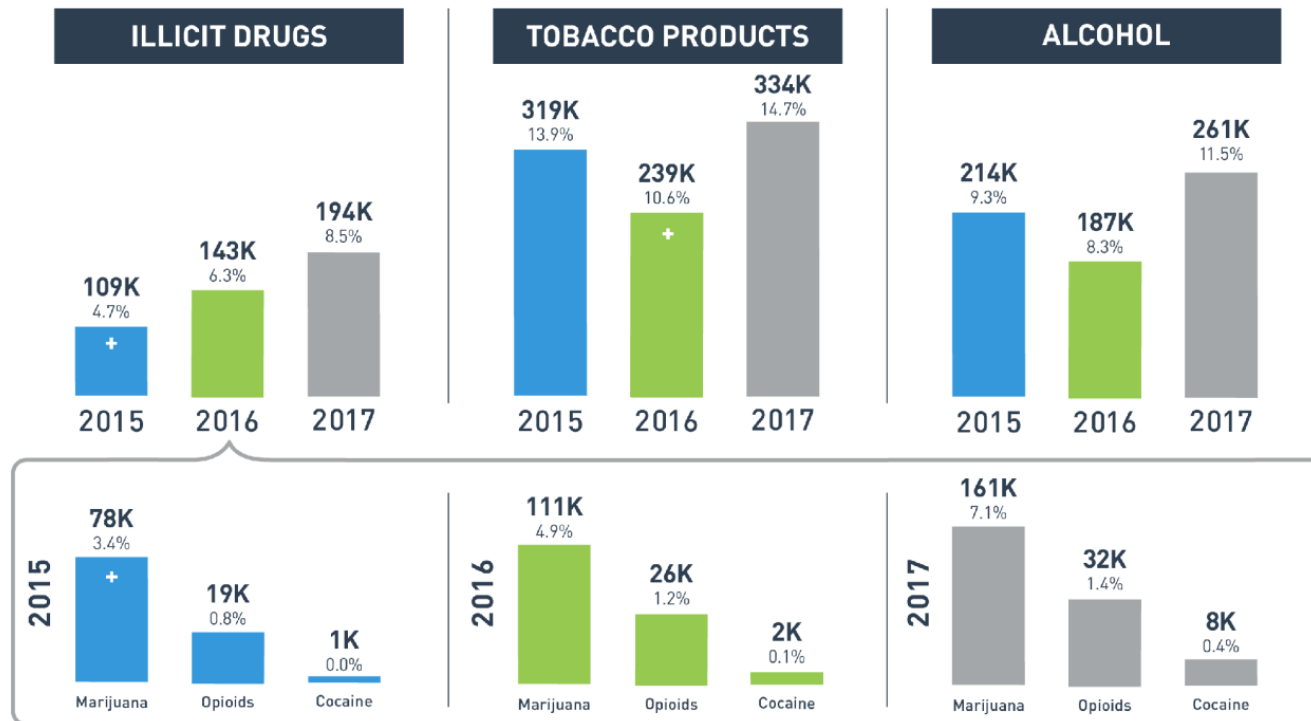


# Composition



# Substance Use in Past Month Among Pregnant Women

PAST MONTH, 2015 - 2017, 15 - 44



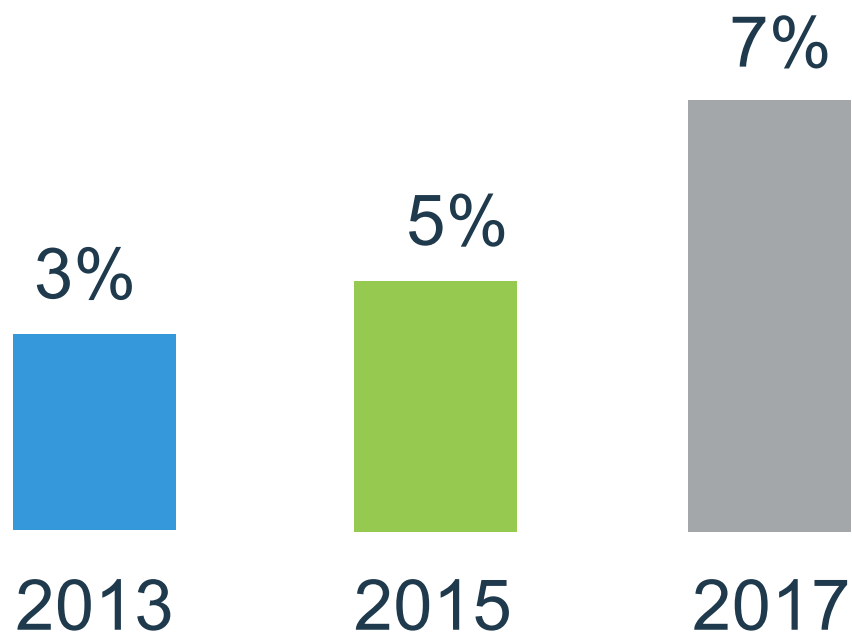
Special analysis of the 2017 NSDUH Report.

+ Difference between this estimate and the 2017 estimate is statistically significant at the .05 level.



# More Women Using Cannabis During Pregnancy

Rates more than doubled in a four year span.



# More Women Using Cannabis During Pregnancy

Rates **more than doubled** in a four year span.

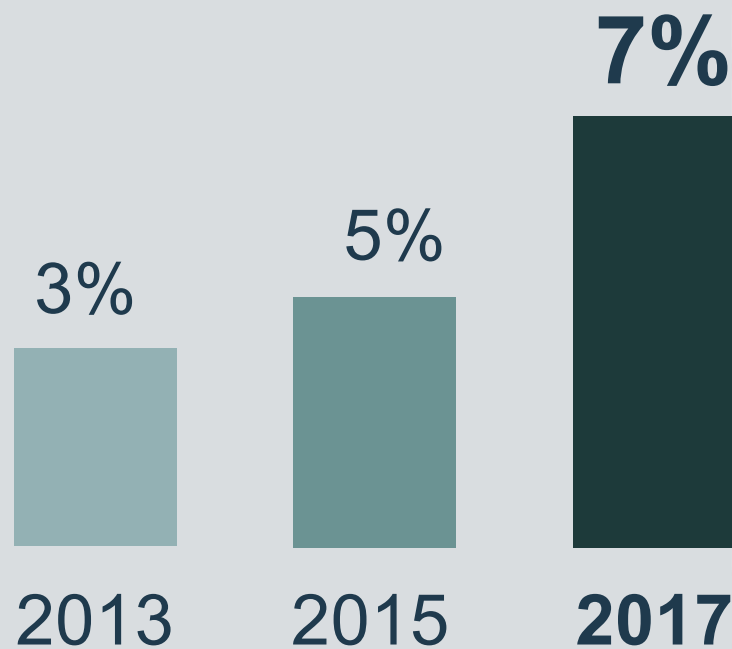
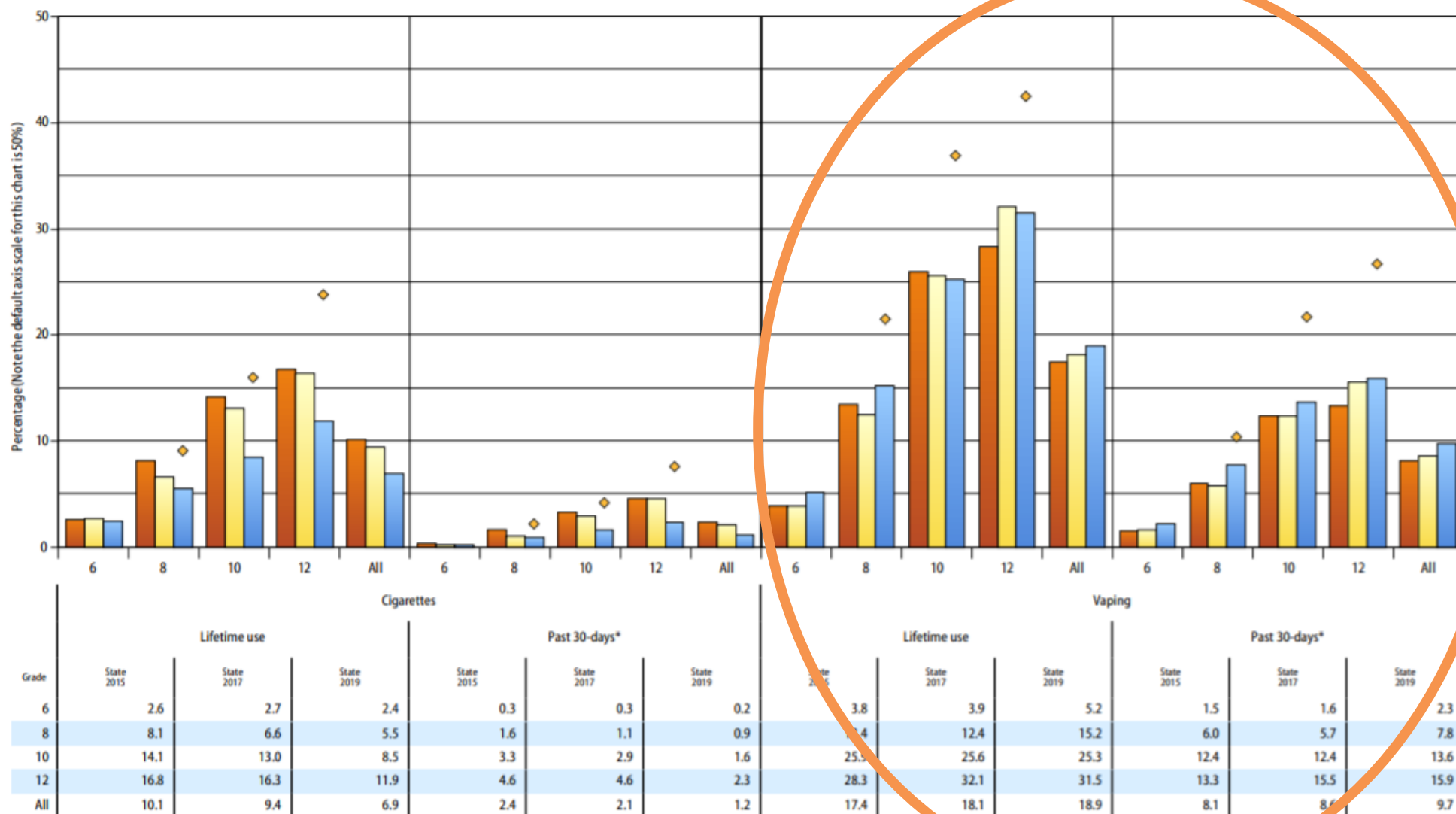


Photo by [Vanessa](#) on [Unsplash](#)



## State-identified priority substance use - Cigarettes and vaping products

### State of Utah 2019 Student Survey



\* Since not all students answer all questions, the percentage of students reporting use in the past 30 days may be greater than the percentage reporting lifetime use.

\*\* National comparison data are available for 8th, 10th, and 12th grade only. Monitoring the Future does not survey 6th graders.

State 2015 State 2017 State 2019 MTF\*\*



“They’re  
starting  
because of the  
flavors,  
but they’re  
**getting addicted**  
because of the  
nicotine.”

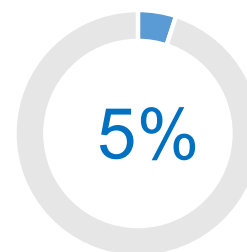
*Stuart Hudnall,  
Assistant Principal at  
Herriman High School*



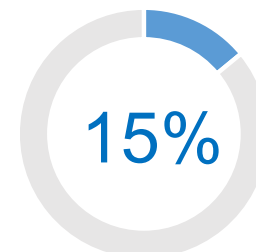
**10%**

of middle and high  
school students  
reported **vaping** in  
the **past 30 days**.

# The Facts about Youth Vaping in Utah

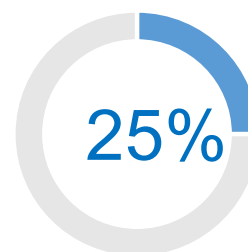


6<sup>th</sup> Graders

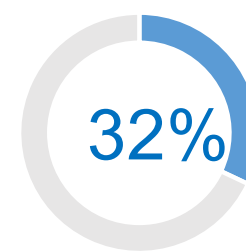


8<sup>th</sup> Graders

**Have tried vaping at least once**



10<sup>th</sup> Graders

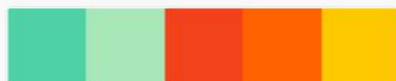
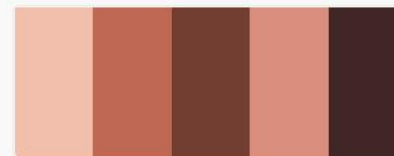
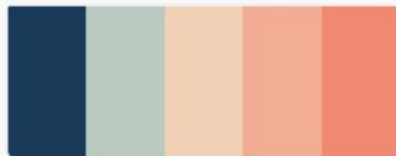
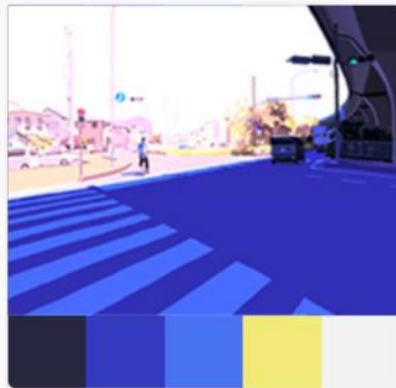


12<sup>th</sup> Graders

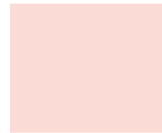
SOURCE: UTAH SHARP 2019



# Color



# Vary lightness to communicate value

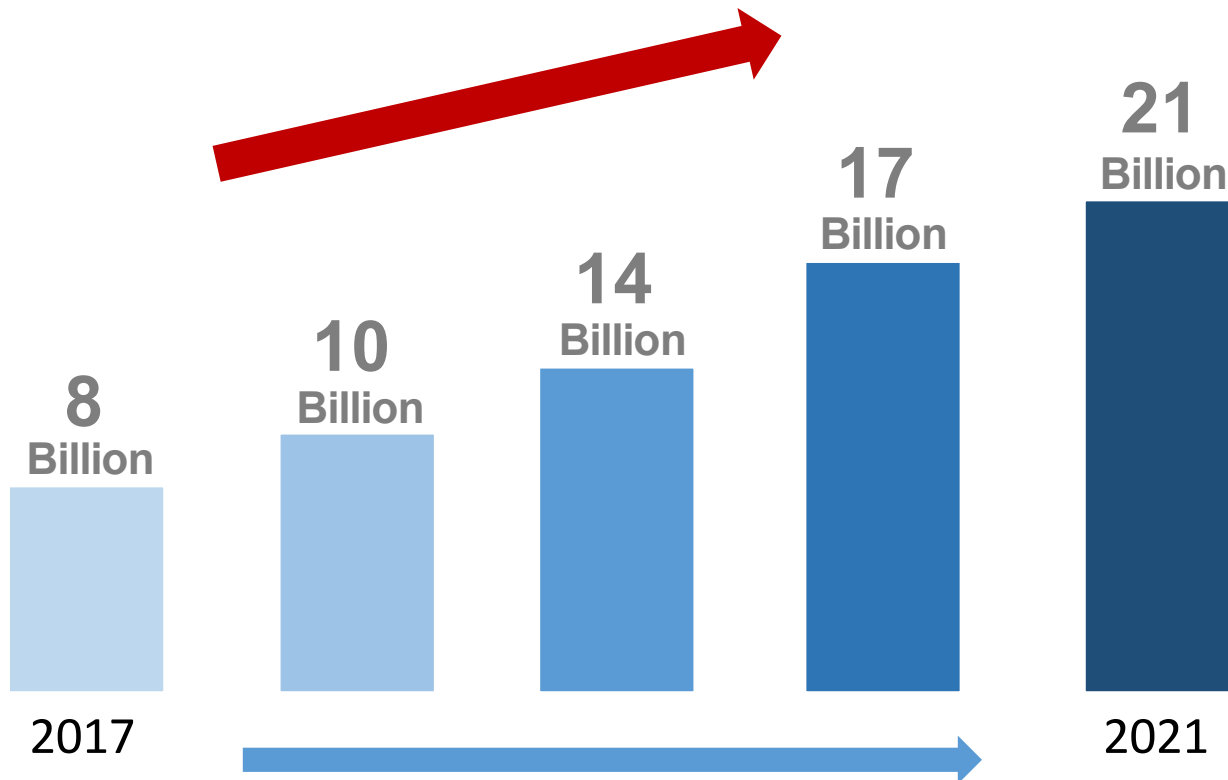


**Lower**  
Lighter

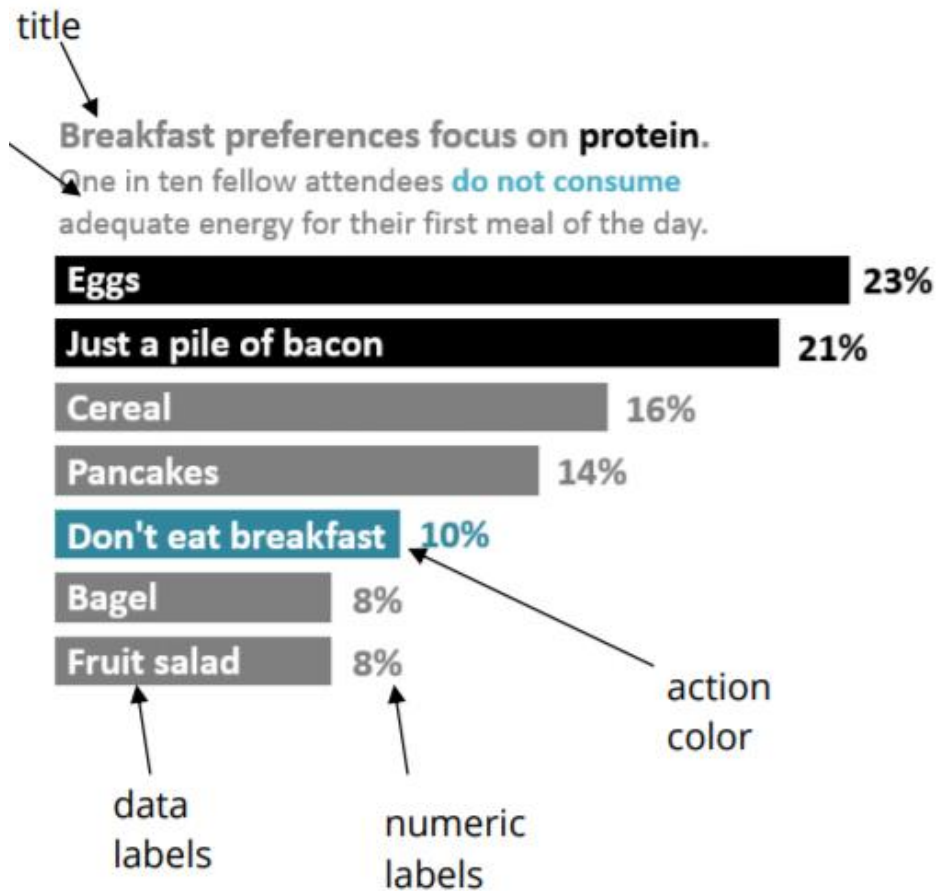


**Higher**  
Darker

# Projected Sales 2017-2021



# ACTION Color



# THE STATE OF TOBACCO USE IN MAINE

## Penobscot County Profile



### CURRENT CIGARETTE SMOKING RATES

More than 21 in 100 adults in Penobscot County

17 in 100 adults in Maine

14 in 100 adults in the United States



If Penobscot County's current cigarette rate among adults was on par with the national average, 10,954 fewer adults would smoke. This is about the population of Orono.

### PENOBSCOT COUNTY

ADULT SMOKING RATE

**21.2%** (MAINE 17.3%)

3rd HIGHEST  
RATE IN MAINE

### TOBACCO INDUSTRY INFLUENCE IN MAINE



Tobacco Companies' Annual  
Marketing Spending in Maine

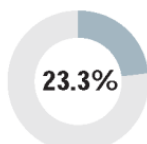


State Spending on  
Tobacco Prevention

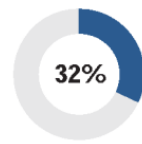
### ADULT TOBACCO USE DISPARITIES

Current smoking rates are **higher** among adults with mental illness.

People with a behavioral health condition are not only more likely to smoke, they also smoke more frequently. They account for **25% of the adult population**, but they **consume 40% of cigarettes** sold in the U.S.



Current smoking rate  
among adults **with no**  
mental illness

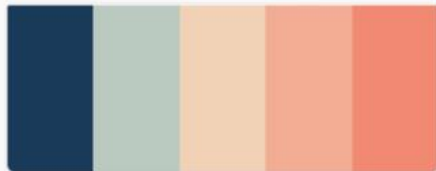
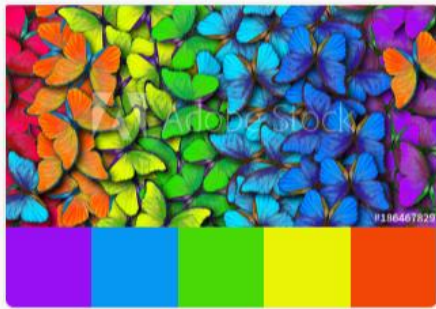
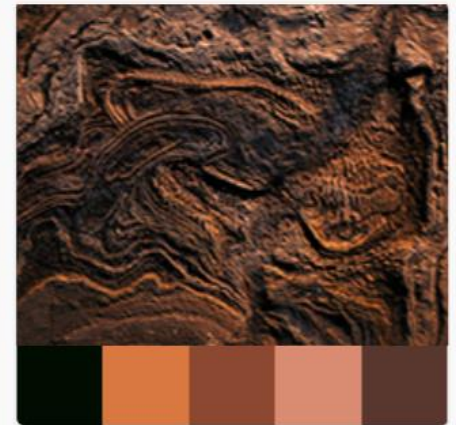
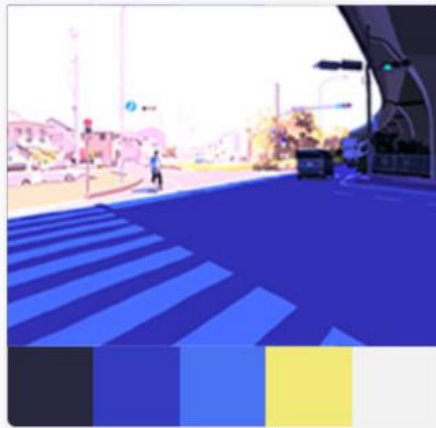
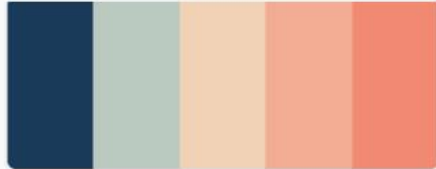


Current smoking rate  
among adults **with**  
any mental illness





# Color Scheme Brainstorming



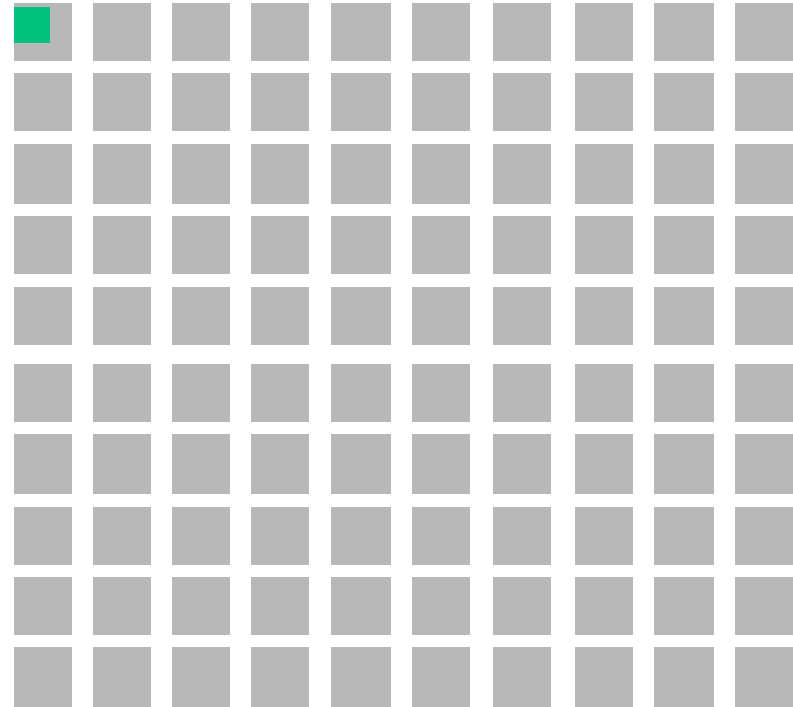
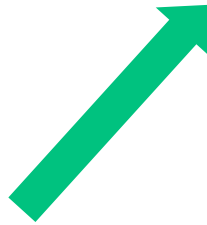
# Context



Wow!  
A million dollars!

## Marijuana Tax Revenue

Makes up less  
than 1% of total  
general  
fund revenue



**General Fund Revenue**



(45  
Grams)

DELICIOUS

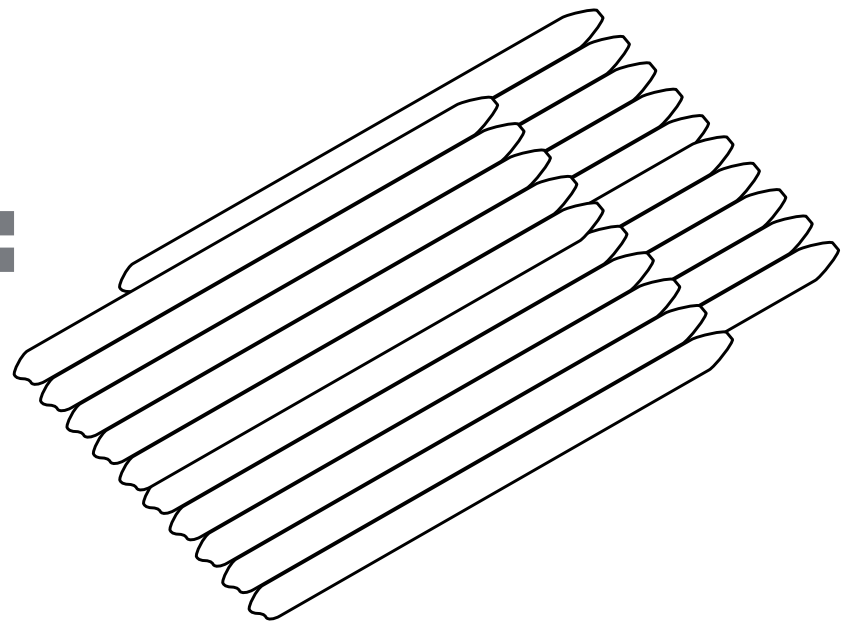
MILK CHOCOLATE

(43  
Grams)



100 milligrams of THC

=



20 Joints from the 1970s



---

# 37,767

students are struggling  
with nicotine addiction in  
our state right now.

---

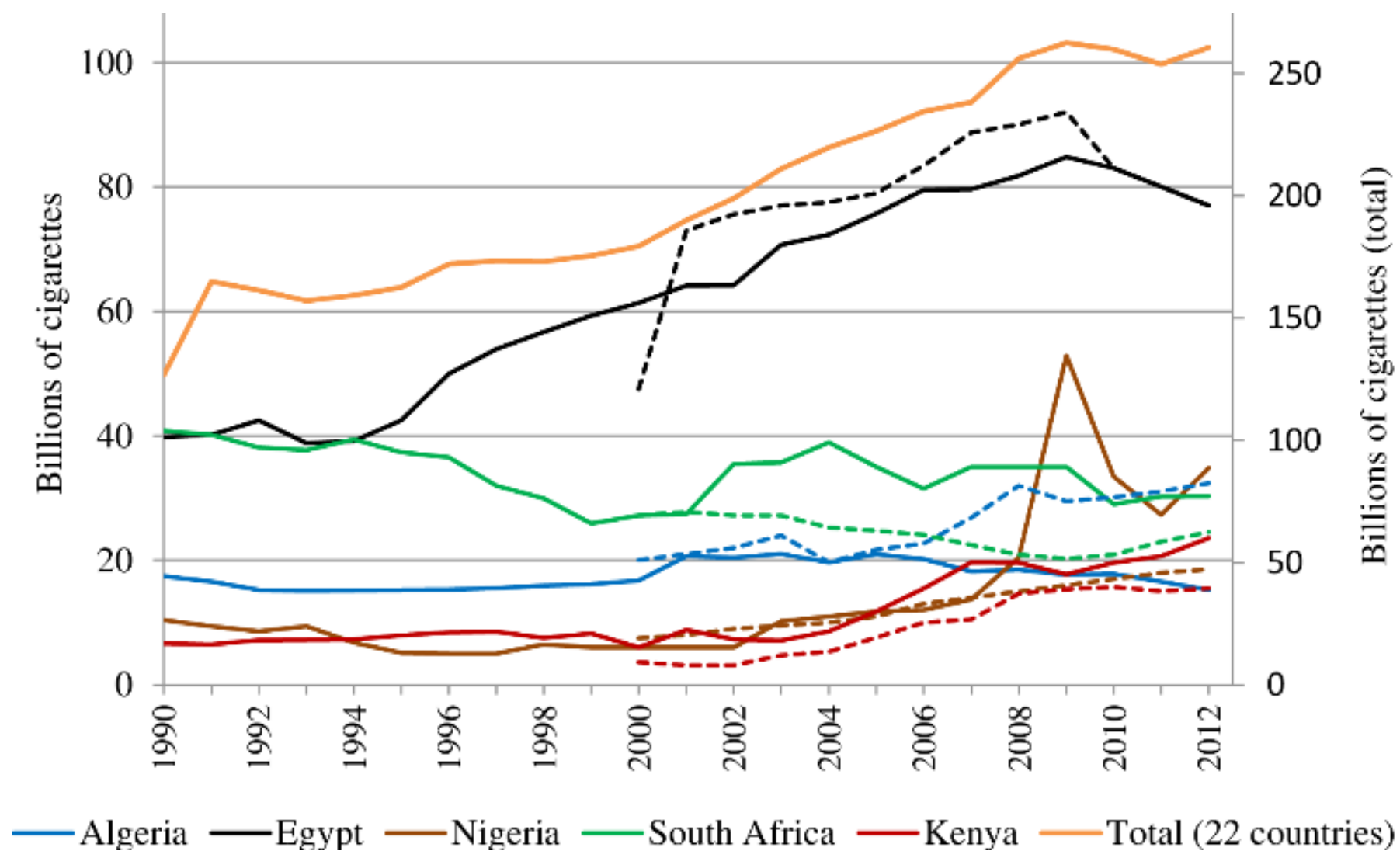
This is about the  
population of Cedar City.



# Clutter

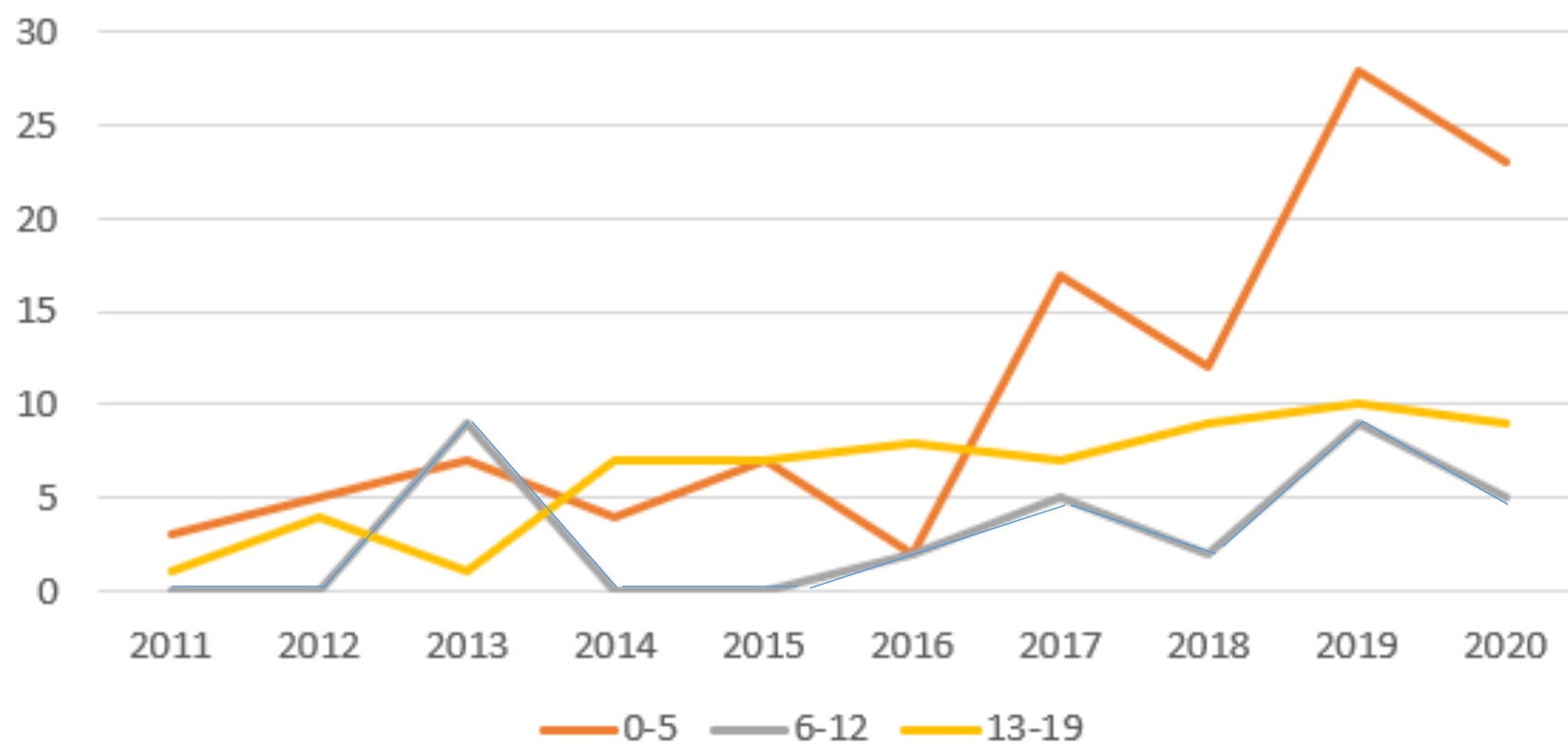




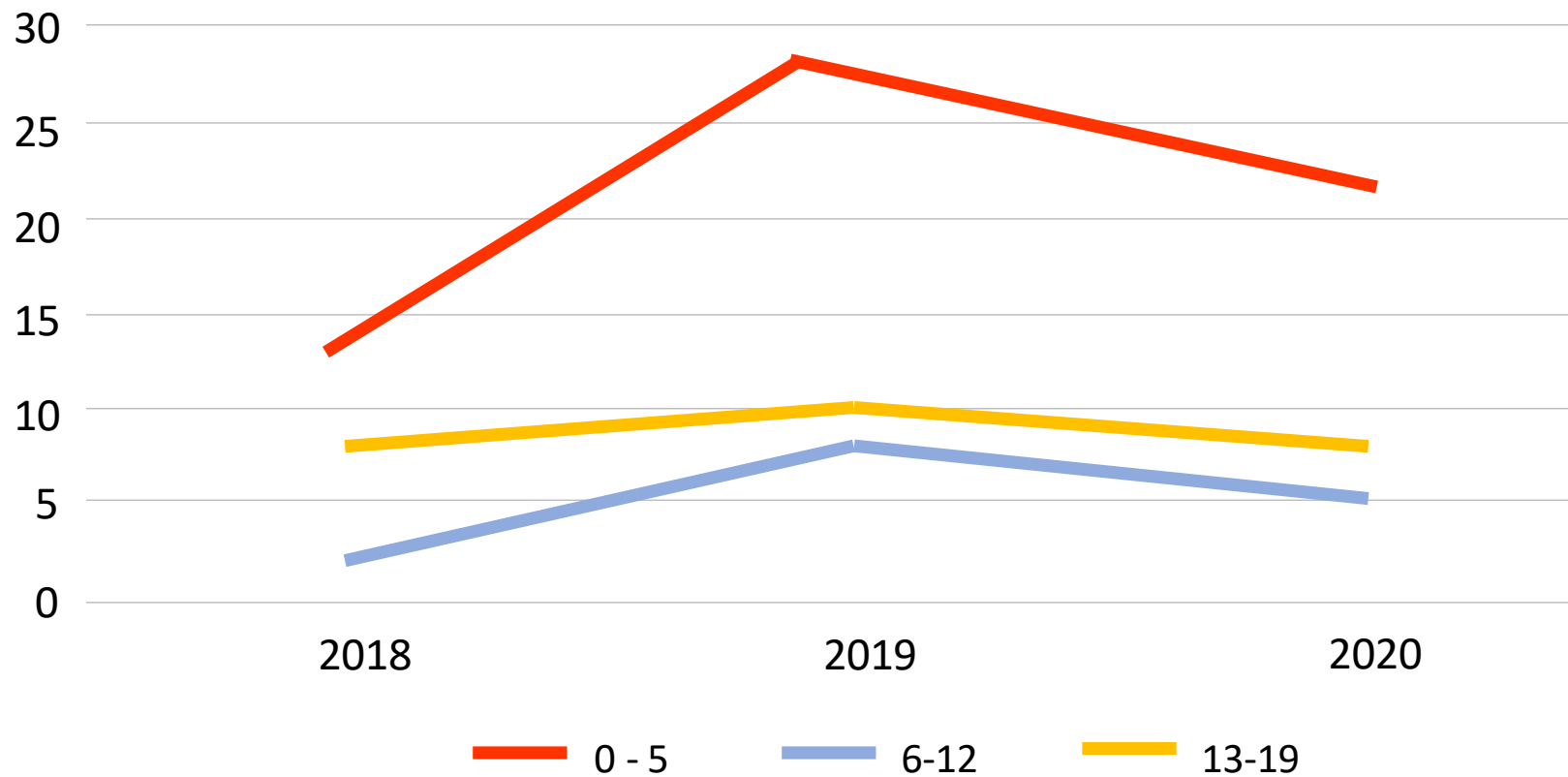


## NNEPC ME Exposure Cases Involving Only Marijuana

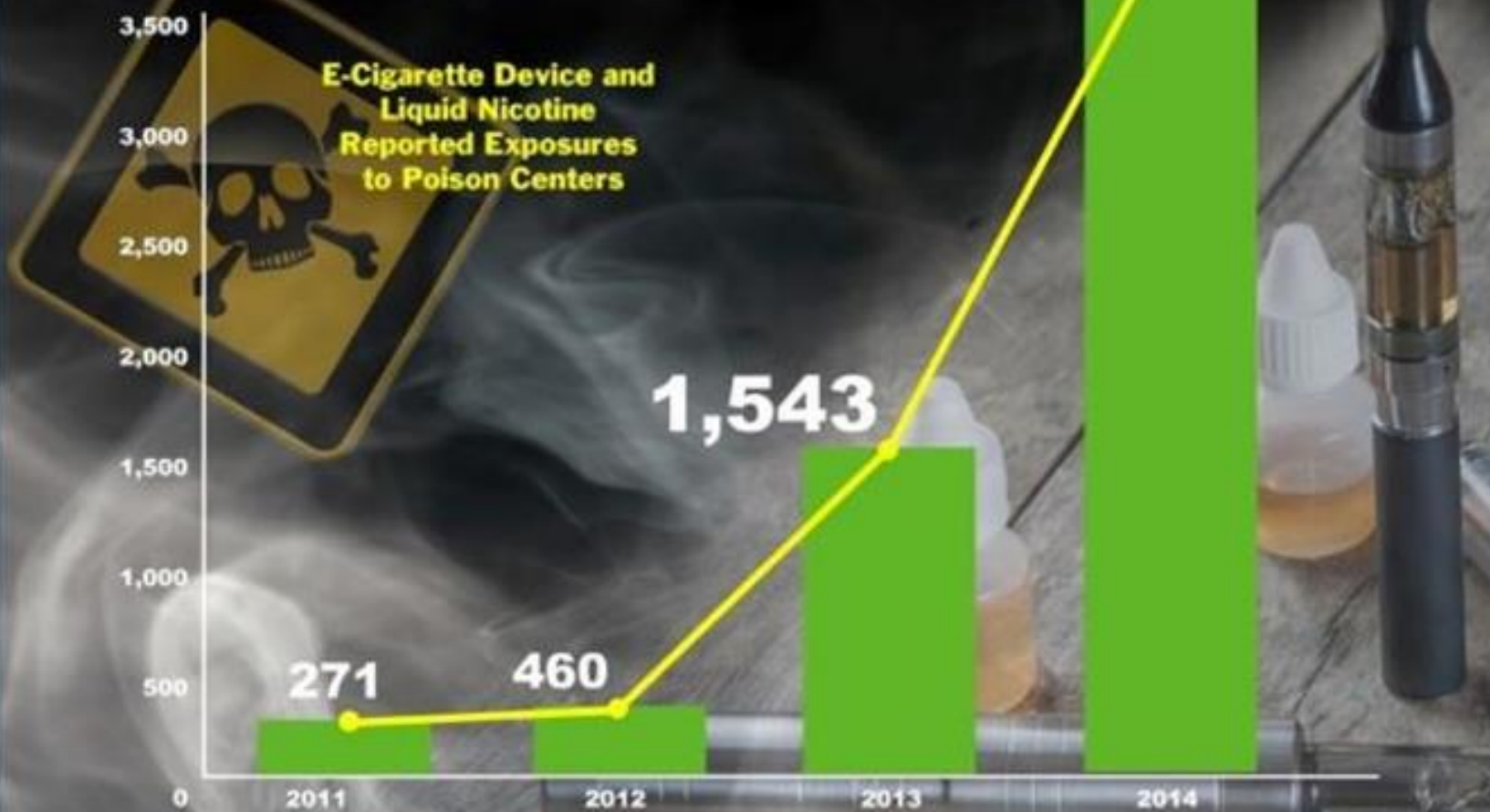
### Age Group by Year



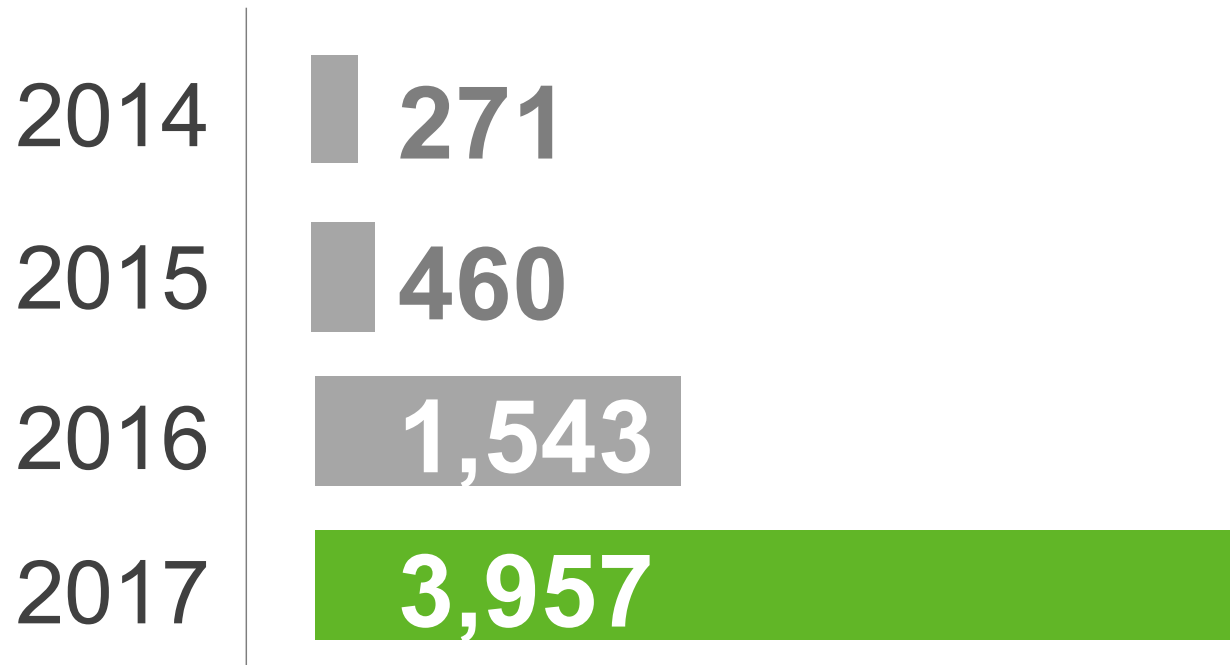
## Exposure cases involving marijuana only peaked in 2019



# Poisoning Calls Related to E-Cigarettes Have Skyrocketed

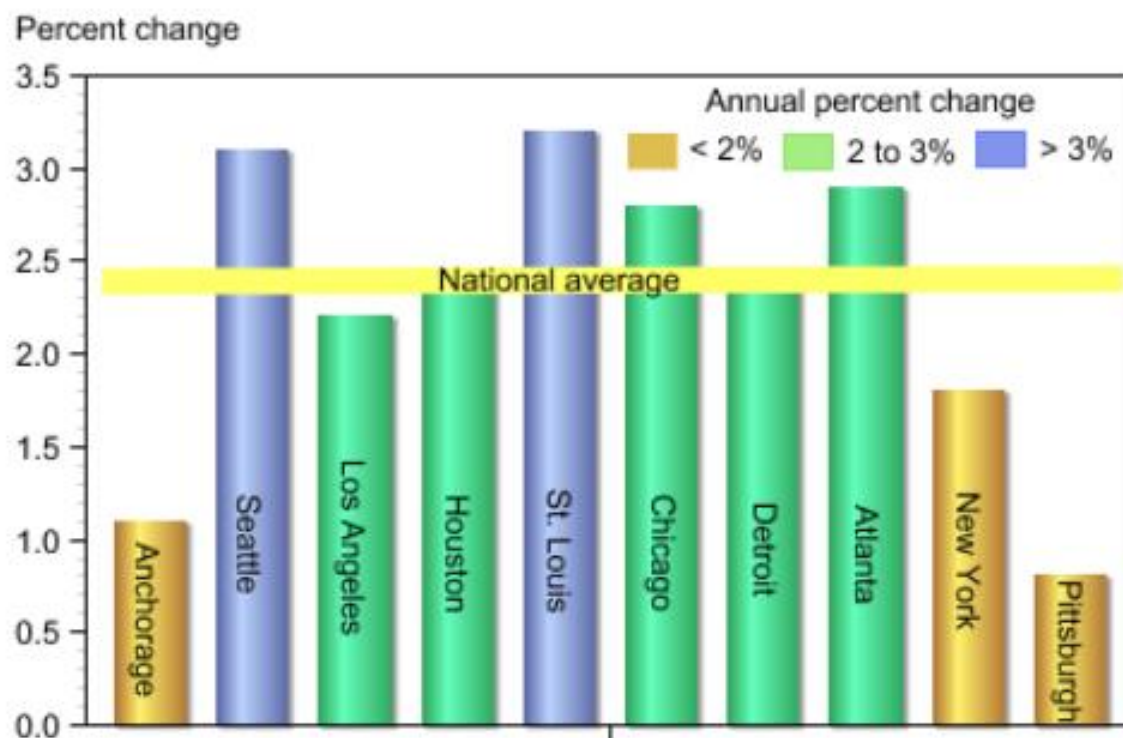


## Poisoning calls related to e-cigarettes increased 1,360% from 2014 to 2017



### Annual grocery store inflation by city, 2014

*In 2014, food price inflation was higher in Seattle, St. Louis, Chicago, and Atlanta than in other metropolitan areas*



Source: Calculated by ERS, USDA, using Bureau of Labor Statistics (BLS) data.

## 2014 Annual grocery store inflation by city

Food price inflation was higher in Seattle, St. Louis, Chicago, and Atlanta than in other metropolitan areas

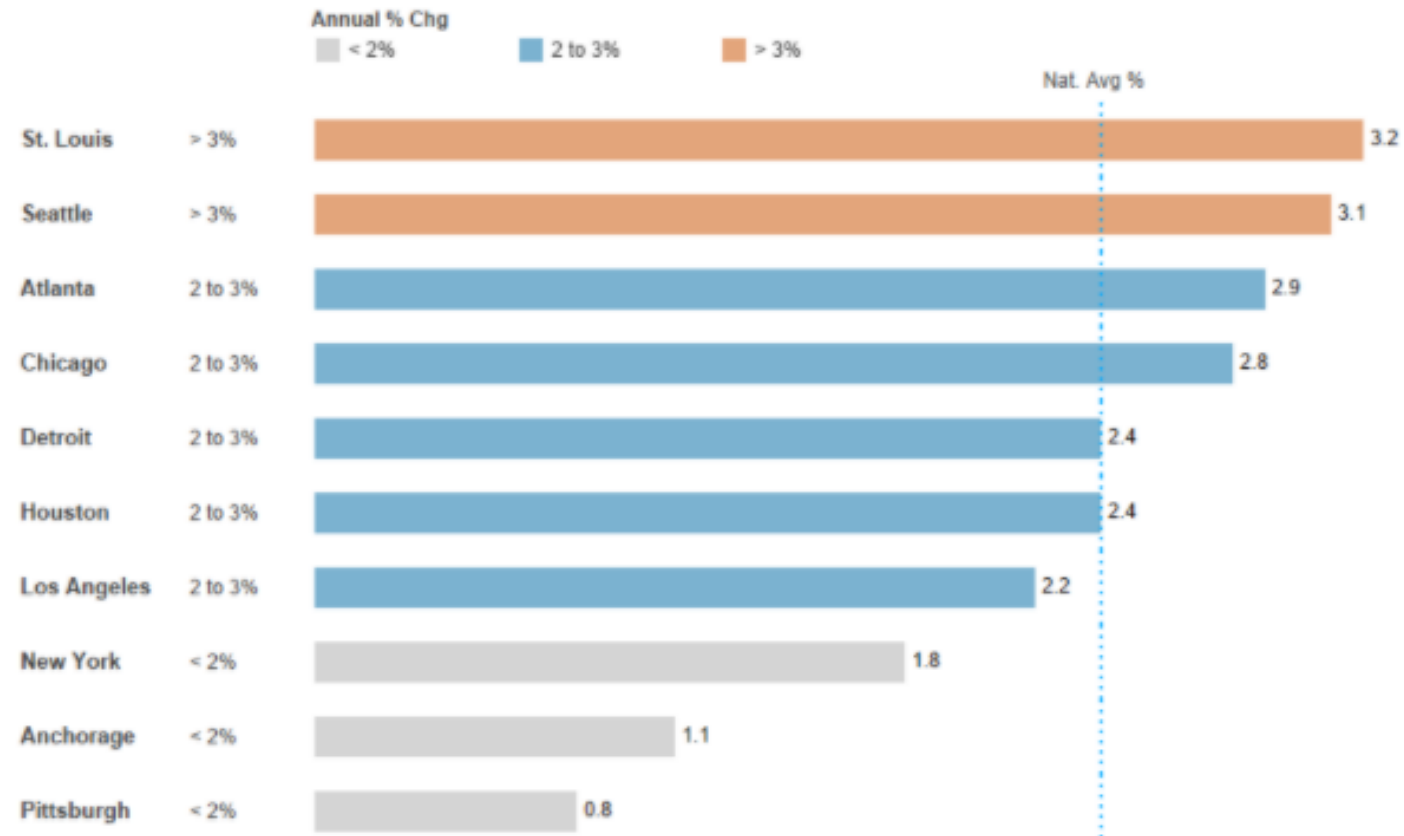


Chart credit: Melissa Yu, BlueGranite.com, 6/3/2016



# **Titles**

**Find  
the hook.**



# Resources





### **Design for lay audiences.**

Statistical information can easily overwhelm. Gear all design toward lay audiences. Remember people look for comparisons and themes. Make them easy to see! People read left to right, top to bottom. Avoid centering.

### **De-clutter! Remove grid lines and tick marks.**

The more "noise" ...AKA extra info you can delete, the easier to interpret.

### **Titles and subtitles matter.**

Make sure they're concise, interesting and at top left.  
Spend time creating a title that creates a "hook" and conveys the main point.  
Position at the top left, so it's read first.

### **Use color as a tool to your advantage.**

Consider using an action color.  
Select color palette that goes with the theme and/or appeals to your audience.  
Use gradients of color: lowest value/lightest color - highest value/darkest color.

### **Limit the use of legends. Avoid whenever possible.**

Example: when creating a bar chart, place horizontal labels beside or on the bars.

### **Select the right data visualization for the job.**

There are many online resources for deciding whether a pie chart, line graph, or bar chart, etc makes the most sense.

### **Present in 2D.**

3D charts may look more sophisticated, but experts agree they are harder to read.

### **Use round numbers.**

Round to the nearest whole number for the quickest, easiest transfer of information.

### **Put it in context.**

Numbers are meaningful when we understand them in relation to the total picture.

## DATA VISUALIZATION RESOURCES

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Data Viz Project

[www.DataVizProject.com](http://www.DataVizProject.com)

Stephanie Evergreen

<https://stephanieevergreen.com/>

Alberto Cairo

<http://albertocairo.com/>

Alberto Cairo Youtube tutorial

<https://www.youtube.com/playlist?list=PLADcUFruM-1BYJjJzeEy8BVohELz4dJ57>

Library of Missing Datasets

<https://mimionuoha.com/the-library-of-missing-datasets>

Google Infographics Toolbox

[https://docs.google.com/drawings/d/1mEjyhAjJTqzqIBxi9niAmV0nLdmhbUZbGMziwHdRstg/tem  
plate/preview](https://docs.google.com/drawings/d/1mEjyhAjJTqzqIBxi9niAmV0nLdmhbUZbGMziwHdRstg/template/preview)

Excel Cheat

<https://www.customguide.com/cheat-sheet/excel-cheat-sheet.pdf>

Tableau

<https://public.tableau.com/en-us/s/>

The Data Innovation Project

<https://datainnovationproject.org/>

Making Data Talk

<https://www.cancer.gov/publications/health-communication/making-data-talk.pdf>

Information is Beautiful Website

<https://informationisbeautiful.net/>

# Digital Storytelling 101

Native Connections  
Substance Abuse and Mental Health Services Administration  
U.S. Department of Health and Human Services



**SAMHSA**  
Substance Abuse and Mental Health  
Services Administration

# Digital Storytelling Resources

Telling Tales: Digital Storytelling as a Tool for Qualitative Data Interpretation and Communication

<https://journals.sagepub.com/doi/full/10.1177/16094069211022529>

Data Gathering and Narrative Based Impact Assessment through Story Telling and Story Collection

<https://jliflc.com/resources/data-gathering-narrative-based-impact-assessment-story-telling-story-collection/>

Digital Storytelling 101

<https://www.youtube.com/watch?v=Tslr91gurY8>

Practical Uses for Digital Storytelling

<https://www.youtube.com/watch?v=gNAFY65LyoM>












## Data Visualization Tutorials with Alberto Cairo

38 videos • 1,823 views • Last updated on Sep 1, 2019



Erin Malone

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Alberto Cairo
- 6  Designing the graphics in "The Truthful Art". 1.6  
Alberto Cairo
-  Designing the graphics in "The Truthful Art". 2.1: PIVOT TAB

# The Library of Missing Data Sets

<https://mimionuoha.com/the-library-of-missing-datasets>

MIMI  
ONUOHA

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writing

A Quiet Violence

On Classification

The Point of Collection

Us, Aggregated

Missing Data

"What is Missing Is Still  
There"

The Library of Missing  
Datasets

The Library of Missing  
Datasets v2.0

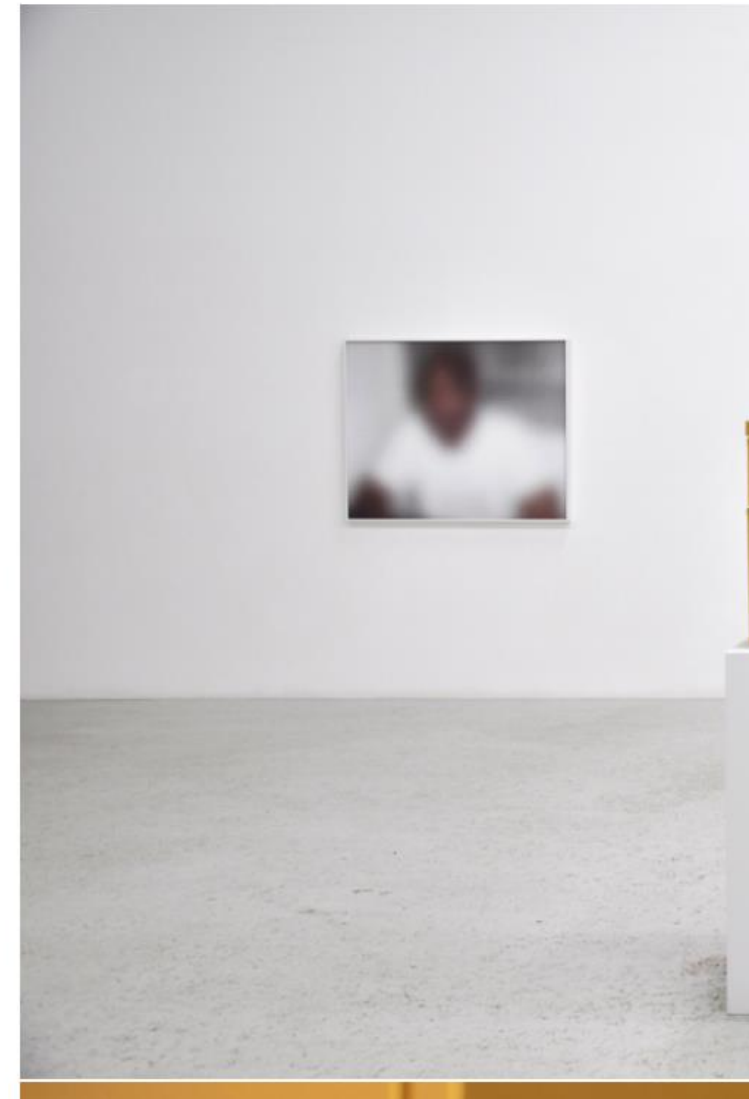
Zines, Prints, Events

*The Library of Missing Datasets 2.0* (2018)

Installation piece

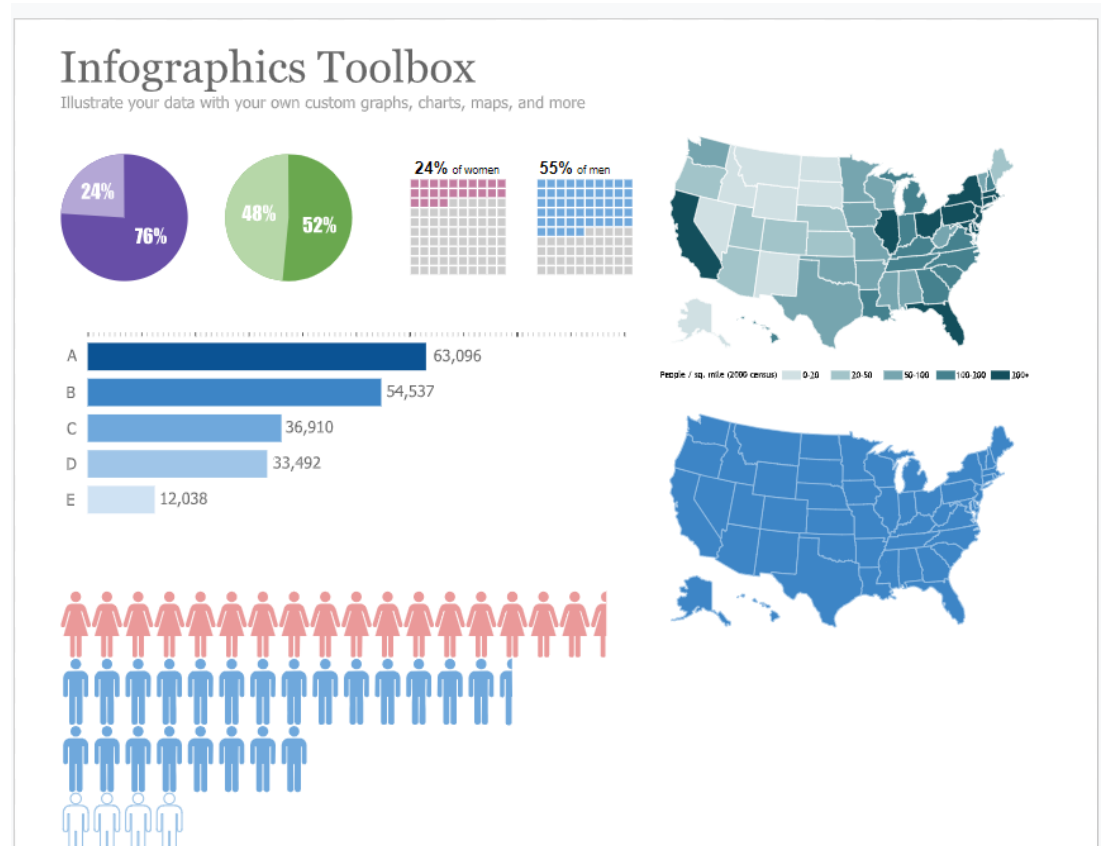
The second installment in *The Library of Missing Datasets* series focuses on American datasets, featuring strongly as objects of collection but also as subjects. *The Library of Missing Datasets 2.0* of *The Library of Missing Datasets* speaks to this reality.

Larger project [here](#).



# Google Infographics Toolbox Template

<https://docs.google.com/drawings/d/1mEjyhAjJTqzqlBxi9niAmV0nLdmhbUZbGMziwHdRstg/template/preview>



# Microsoft Excel Cheat Sheet

<https://www.customguide.com/cheat-sheet/excel-cheat-sheet.pdf>

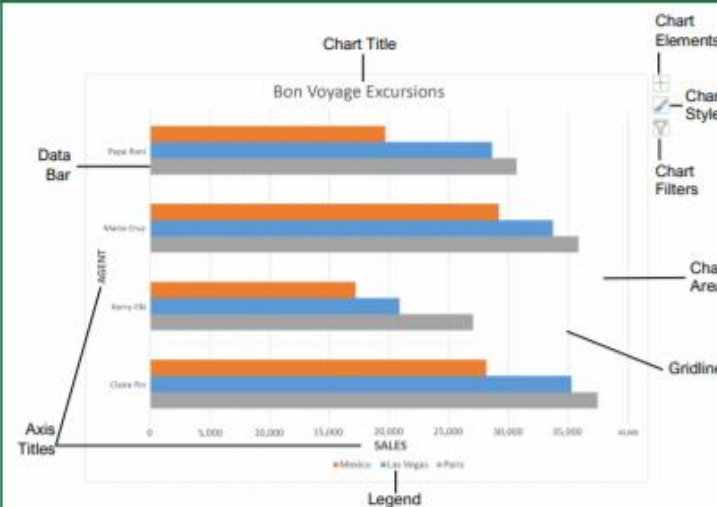


Microsoft®

## Excel Cheat Sheet

Intermediate Skills

### Chart Elements



### Chart Options

#### Chart Types

- Column:** Used to compare different values vertically side-by-side. Each value is represented in the chart by a vertical bar.
- Line:** Used to illustrate trends over time (days, months, years). Each value is plotted as a point on the chart and values are connected by a line.
- Pie:** Useful for showing values as a percentage of a whole when all the values add up to 100%. The values for each item are represented by different colors.
- Bar:** Similar to column charts, except they display information in horizontal bars rather than in vertical columns.
- Area:** Similar to line charts, except the areas beneath the lines are filled with color.
- XY (Scatter):** Used to plot clusters of values using single points. Multiple items can be plotted by using different colored points or different point symbols.
- Stock:** Effective for reporting the fluctuation of stock prices, such as the high, low, and closing points for a certain day.
- Surface:** Useful for finding optimum combinations between two sets of data. Colors and patterns indicate values that are in the same range.

### Charts

**Create a Chart:** Select the cell range that contains the data you want to chart. Click the **Insert** tab on the ribbon. Click a chart type button in the Charts group and select the chart you want to insert.

**Move or Resize a Chart:** Select the chart. Place the cursor over the chart's border and, with the 4-headed arrow showing, click and drag to move it. Or, click and drag a sizing handle to resize it.

**Change the Chart Type:** Select the chart and click the **Design** tab. Click the **Change Chart Type** button and select a different chart.

**Filter a Chart:** With the chart you want to filter selected, click the **Filter** button next to it. Deselect the items you want to hide from the chart view and click the **Apply** button.

**Position a Chart's Legend:** Select the chart, click the **Chart Elements** button, click the **Legend** button, and select a position for the legend.

**Show or Hide Chart Elements:** Select the chart and click the **Chart Elements** button. Then, use the check boxes to show or hide each element.

**Insert a Trendline:** Select the chart where you want to add a trendline. Click the **Design** tab on the ribbon and click the **Add Chart Element** button. Select **Trendline** from the menu.

### Charts

**Insert a Sparkline:** Select the cells you want to summarize. Click the **Insert** tab and select the sparkline you want to insert. In the Location Range field, enter the cell or cell range to place the sparkline and click **OK**.

**Create a Dual Axis Chart:** Select the cell range you want to chart, click the **Insert** tab, click the **Combo** button, and select a combo chart type.

### Print and Distribute

**Set the Page Size:** Click the **Page Layout** tab. Click the **Size** button and select a page size.

**Set the Print Area:** Select the cell range you want to print. Click the **Page Layout** tab, click the **Print Area** button, and select **Set Print Area**.

**Print Titles, Gridlines, and Headings:** Click the **Page Layout** tab. Click the **Print Titles** button and set which items you wish to print.

**Add a Header or Footer:** Click the **Insert** tab and click the **Header & Footer** button. Complete the header and footer fields.

**Adjust Margins and Orientation:** Click the **Page Layout** tab. Click the **Margins** button to select from a list of common page margins. Click the **Orientation** button to choose Portrait or Landscape orientation.

### Additional Chart Elements

**Data Labels:** Display values from the cells of the worksheet on the plot area of the chart.

**Data Table:** A table added next to the chart that shows the worksheet data the chart is illustrating.

**Error Bars:** Help you quickly identify standard deviations and error margins.

**Trendline:** Identifies the trend of the current data, not actual values. Can also identify forecasts for future data.



Click the [topic links](#) for free lessons!



# The Data Innovation Project

[datainnovationproject.org](http://datainnovationproject.org)



# Welcome

The art and science of data

The Data Innovation Project partners with  
work, achieve results, and demonstrate impact  
affect change and tell compelling stories.

# Making Data Talk ...

the best guide  
evah!

National Cancer Institute

U.S. DEPARTMENT  
OF HEALTH AND  
HUMAN SERVICES  
National Institutes  
of Health

**Making Data Talk:**

**A Workbook**





# Thank You!

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INFO INSPIRED





Closing