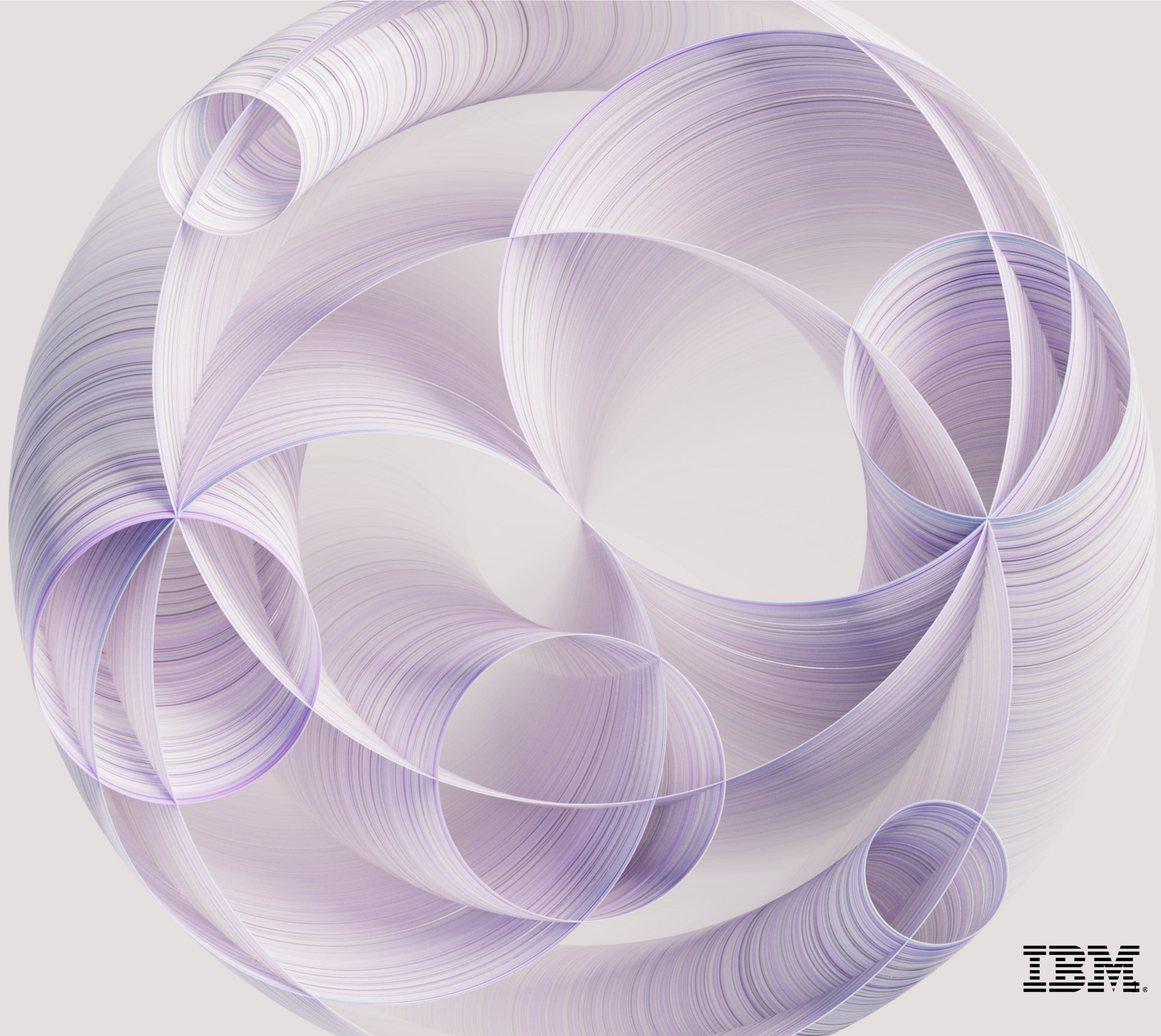# Storytelling with Data

Introduction & Module 1

IBM

Your course facilitators and DOH advisors

Sunaina Menawat
Associate Partner
HHS and Public Health
State & Local Government
IBM Consulting

Mark Freeman
Chief Data Scientist
State & Local Government
IBM Consulting

Zeyno Nixon, PhD, MPH, MA (she/her)
Manager, Data Visualization Section
Center for Data Science

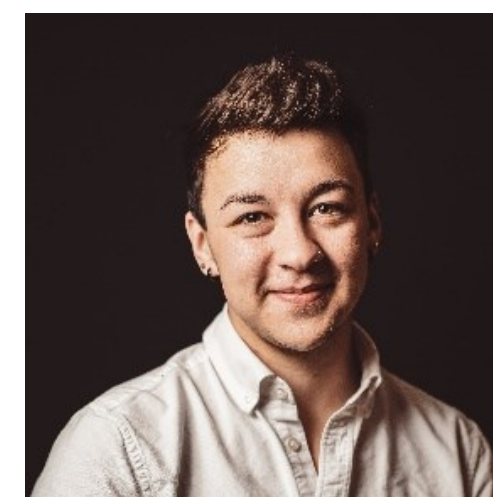**Alexandria Matos** (she/her/ella)
Informatics and Advanced Analytics Supervisor
Prevention and Community Health Division

Francoise Pickart (she/her)
Data Democratization Manager
Center for Data Science
Office of Health + Science

Chess Claire (they/he)
Data Product Owner
Environmental Public Health

What does "storytelling with data" mean to you?

Please share your thoughts in the chat

Storytelling With Data: What It Is ... What It Is Not

What it is

Storytelling With Data =

Better Communication =

Inspiring Healthy Behaviors

What it isn't

Storytelling With Data ≠

Fiction ≠

Better Dashboards

Washington State Department of
HEALTH

Let's use a story to learn about Storytelling With Data

Imagine …

The CDC has received feedback that COVID-19 data shared with the public is confusing and difficult to use.

The CDC has asked us to redesign the presentation of COVID-19 data leveraging best practices for storytelling with data.

What is the public saying?

"I am confused when I look at the graphs. What is it telling me? Am I at risk? Is my community at risk?"
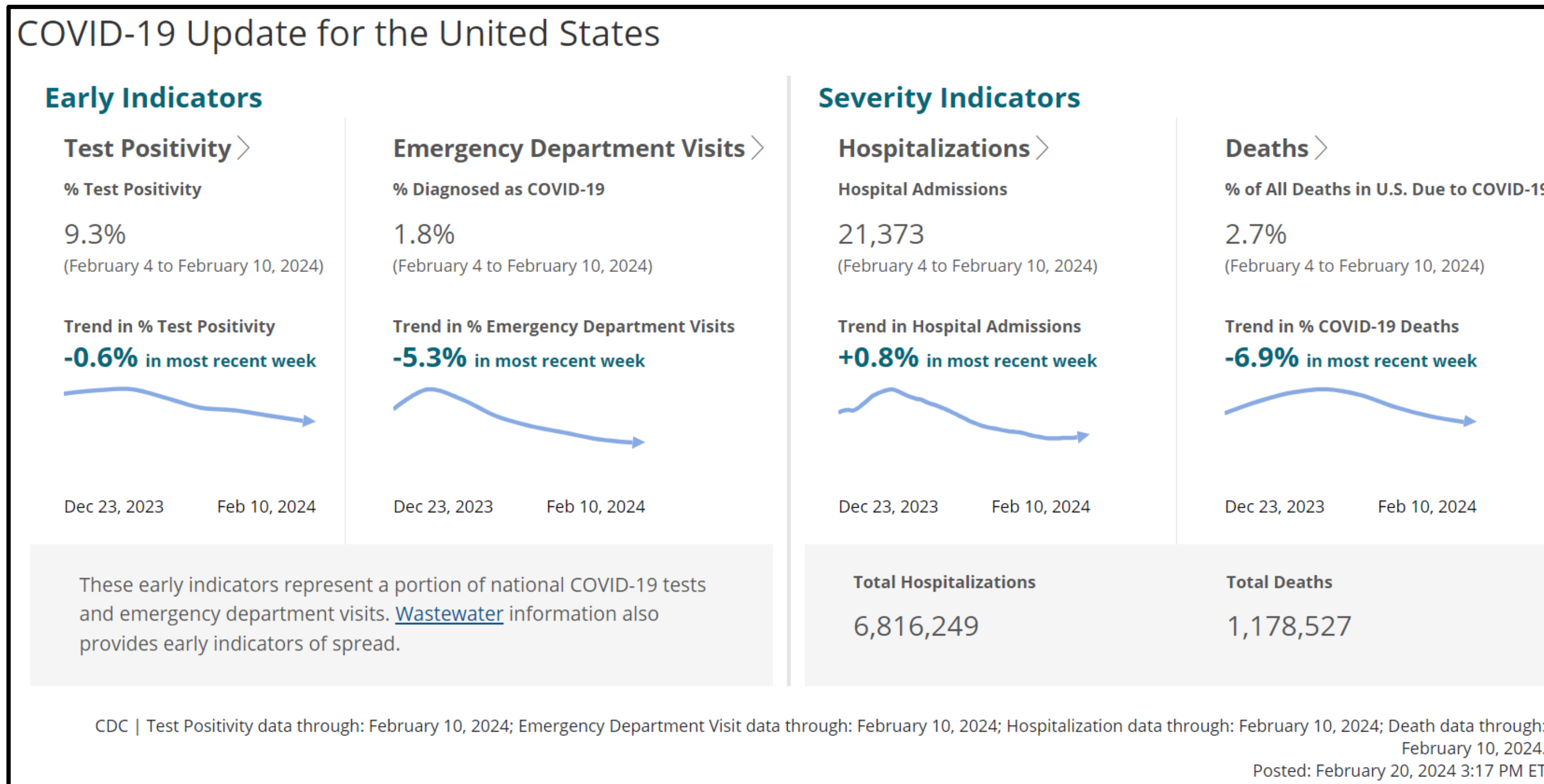
"While national information is readily available, it's hard for me to find information about my community."

"There is a lot of information here, but I am overwhelmed by it. I just want to know if my family is at risk and what I should do to keep us safe."

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Why might the public be confused?

COVID-19 Headline Update: Current Approach

COVID-19 Update for the United States

Early Indicators

Test Positivity ›
% Test Positivity
9.3%
(February 4 to February 10, 2024)

Trend in % Test Positivity
-0.6% in most recent week

Dec 23, 2023   Feb 10, 2024

Emergency Department Visits ›
% Diagnosed as COVID-19
1.8%
(February 4 to February 10, 2024)

Trend in % Emergency Department Visits
-5.3% in most recent week

Dec 23, 2023   Feb 10, 2024

These early indicators represent a portion of national COVID-19 tests and emergency department visits. Wastewater information also provides early indicators of spread.

Severity Indicators

Hospitalizations ›
Hospital Admissions
21,373
(February 4 to February 10, 2024)

Trend in Hospital Admissions
+0.8% in most recent week

Dec 23, 2023   Feb 10, 2024

Deaths ›
% of All Deaths in U.S. Due to COVID-19
2.7%
(February 4 to February 10, 2024)

Trend in % COVID-19 Deaths
-6.9% in most recent week

Dec 23, 2023   Feb 10, 2024

Total Hospitalizations
6,816,249

Total Deaths
1,178,527

CDC | Test Positivity data through: February 10, 2024; Emergency Department Visit data through: February 10, 2024; Hospitalization data through: February 10, 2024; Death data through: February 10, 2024.
Posted: February 20, 2024 3:17 PM ET

- The current approach highlights the United States … doesn't provide an easy way for people to find conditions in their local community.

- As public health experts we know these are good indicators … but non-experts may have a difficult time understanding their meaning … is 9.3% test positivity good or bad?

- There are a lot of good facts presented in an intuitive way … but health risk is not obvious from these numbers … is 1.8% for emergency visits mean I am at risk?

- What should I do to manage health risk? The current approach says nothing about recommended healthy behaviors.
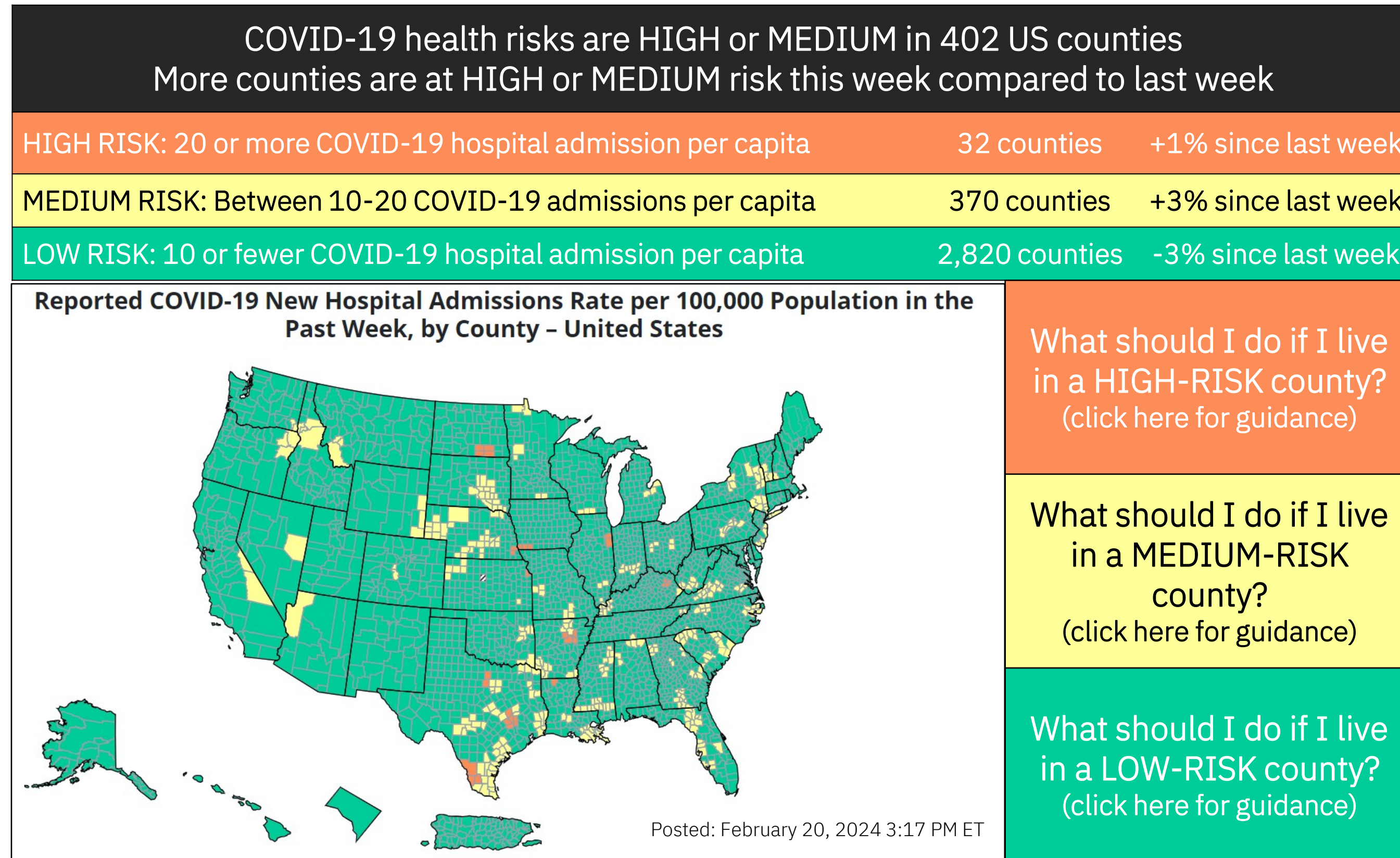
Share your thoughts in the chat:
- What works well with the current approach?
- What could be improved?

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6

What might be more informative?

COVID-19 Headline Update: A New Approach

COVID-19 health risks are HIGH or MEDIUM in 402 US counties More counties are at HIGH or MEDIUM risk this week compared to last week		
HIGH RISK: 20 or more COVID-19 hospital admission per capita	32 counties	+1% since last week
MEDIUM RISK: Between 10-20 COVID-19 admissions per capita	370 counties	+3% since last week
LOW RISK: 10 or fewer COVID-19 hospital admission per capita	2,820 counties	-3% since last week

Reported COVID-19 New Hospital Admissions Rate per 100,000 Population in the Past Week, by County – United States

What should I do if I live in a HIGH-RISK county?
(click here for guidance)

What should I do if I live in a MEDIUM-RISK county?
(click here for guidance)

What should I do if I live in a LOW-RISK county?
(click here for guidance)
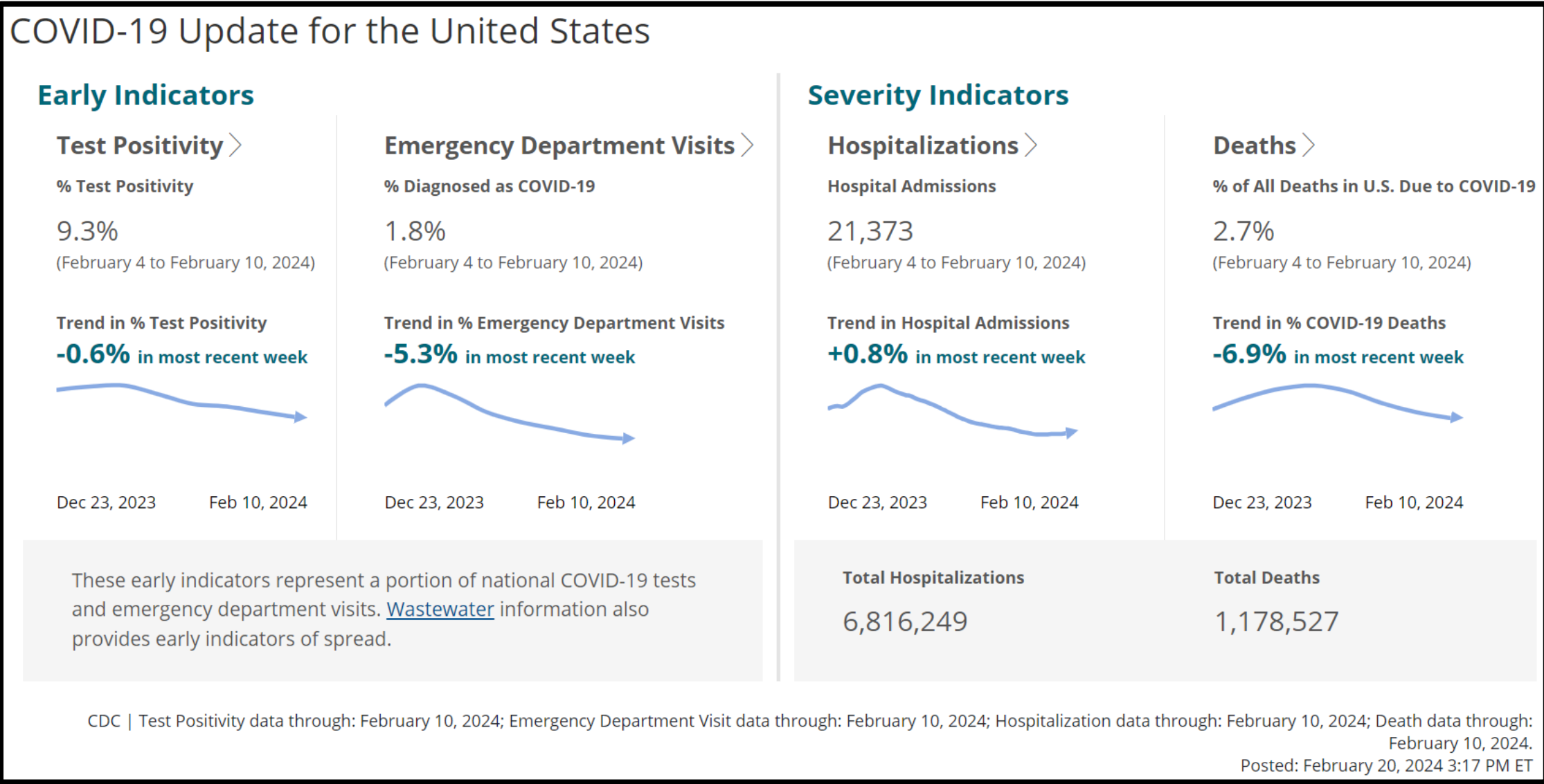
Posted: February 20, 2024 3:17 PM ET

- The new approach talks about how many counties are at elevated risk, addressing the public's need for information about their local community.

- The main visualization is now a map, enabling the public to easily see the risk level in their community.

- The new approach uses a single metric (hospital admission rate) simplifying communication.

- Hospital admission rates are explicitly tied to health risk levels, based on the scientifically grounded "hospital admission levels" framework published by the CDC.

- Links to recommended health behaviors are prominently displayed and harmonized with the risk framework we are using in our data story.
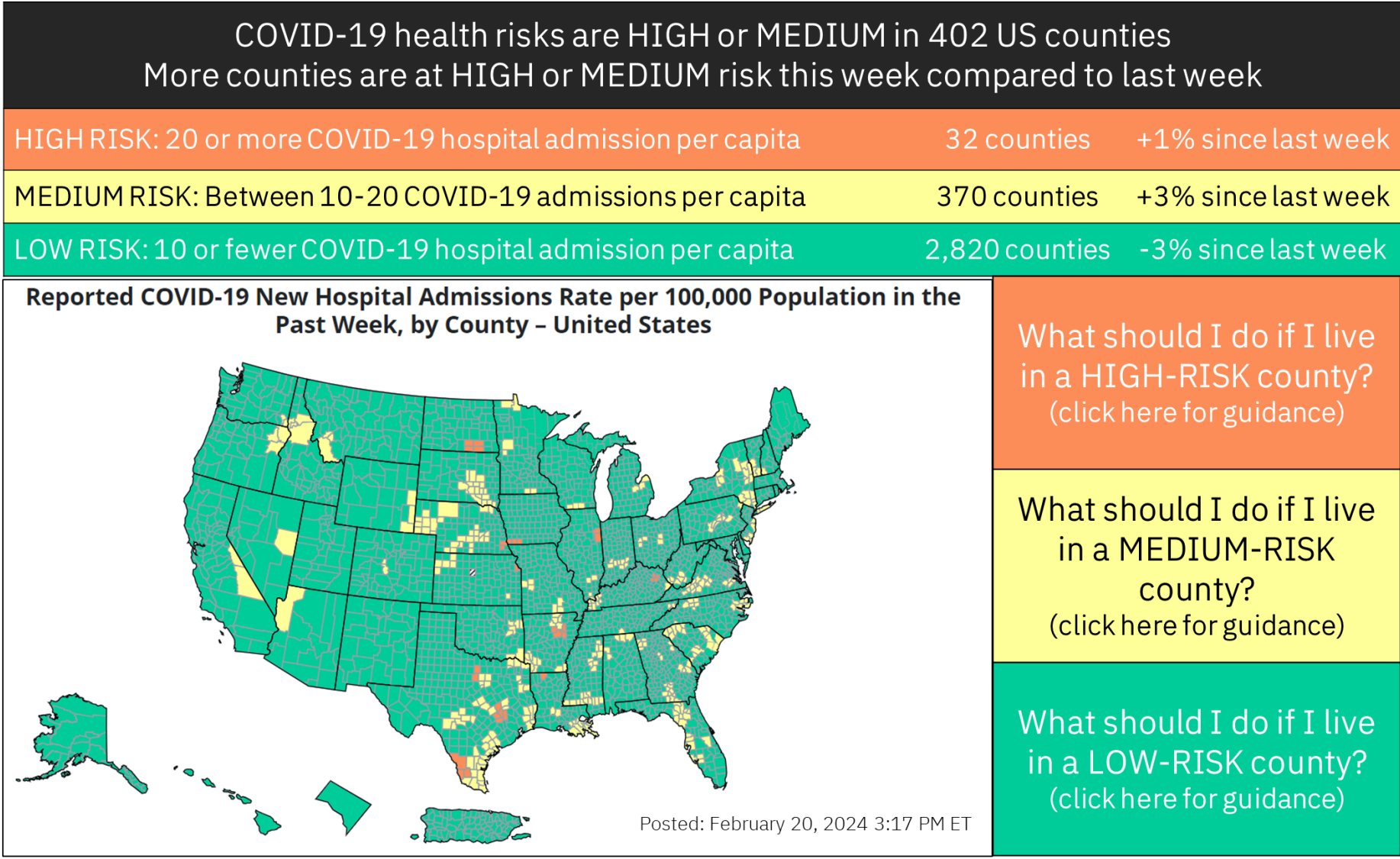
Share your thoughts in the chat:
- Why aren't we doing this now?
- What makes storytelling with data so hard?

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This webinar will teach you how to go …

From Here

COVID-19 Update for the United States

Early Indicators

Test Positivity ›
% Test Positivity
9.3%
(February 4 to February 10, 2024)

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CDC | Test Positivity data through: February 10, 2024; Emergency Department Visit data through: February 10, 2024; Hospitalization data through: February 10, 2024; Death data through: February 10, 2024.
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To There

COVID-19 health risks are HIGH or MEDIUM in 402 US counties
More counties are at HIGH or MEDIUM risk this week compared to last week

HIGH RISK: 20 or more COVID-19 hospital admission per capita — 32 counties — +1% since last week

MEDIUM RISK: Between 10-20 COVID-19 admissions per capita — 370 counties — +3% since last week

LOW RISK: 10 or fewer COVID-19 hospital admission per capita — 2,820 counties — -3% since last week

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What should I do if I live in a HIGH-RISK county? (click here for guidance)

What should I do if I live in a MEDIUM-RISK county? (click here for guidance)

What should I do if I live in a LOW-RISK county? (click here for guidance)

Posted: February 20, 2024 3:17 PM ET

We will teach you storytelling best practices in three sessions or modules

TODAY: MODULE 1

Module 1 will show you how to:
- Identify with your audience
- Craft a compelling storyline

NEXT WEEK: MODULE 2

Module 2 will show you how to:
- Draft a data story
- Get feedback and finalize your story

WEEK AFTER NEXT: MODULE 3

Module 3 will show you how to:
- Choose methods to deliver your story
- Incorporate ongoing feedback

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Public health data storytelling must use an equity lens

Data stories will often need to leverage the 5 Social Determinants of Health.

"Social Determinants are conditions in places where people, live, learn, work, and play that affect a wide range of health and quality-of-life-risks and outcomes" (CDC).

Social Determinants help us tell stories about people impacted by systems, rather than attributing public health outcomes to individual behaviors.

1	**ECONOMIC STABILITY**	The connection between the financial resources people have and their health.
2	**EDUCATION ACCESS AND QUALITY**	The connection of education to health and wellbeing.
3	**HEALTH ACCESS AND QUALITY**	The connection between people's access to and understanding of health services and their own health.
4	**NEIGHBORHOOD AND BUILT ENVIRONMENT**	The connection between where a person lives and their health and wellbeing.
5	**SOCIAL AND COMMUNITY CONTEXT**	The connection between characteristics of the contexts within which people live, learn, work and play and their health and wellbeing.

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Equitable public health data storytelling is guided by do-no-harm principles

01 Critically examine your data

02 Use people-first language

03 Label people, not skin color

04 Labels and their hierarchy have meaning

05 Consider missing groups

06 Use color with awareness and care

07 Consider impact of icons and shapes

08 Connect with those central to your research

09 Reflect lived experiences

10 Understand your audience's needs

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Module 1: Audience & Storyline

1.1 Methods for Audience Engagement

1.2 Using Personas for Audience Empathy

1.3 Use Needs Statement to Define Main Idea

1.4 Using a Storyboard to Craft a Storyline

1.5 Hands on Practice

1.1 Methods for Audience Engagement

Identifying and engaging your audience is fundamental in 'Do no harm' storytelling. It helps you **connect**, **understand their needs**, and **reflect their lived experiences** into your data story, shifting your mindset from 'what to build' to 'who am I building for?' There are many techniques to understand your audience, in this course we will use **Persona Building.**

Audience Engagement Continuum

Minutes to Hours   *Do I have time to engage my audience?*   **Weeks to Months**

Persona Building   Empathy Mapping   Surveys   Interviews   Focus Groups   Co-Design

"I think the best stories always end up being about the people rather than the event, which is to say character-driven." — Stephen King

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1.2 Create a persona to quickly empathize with your audience
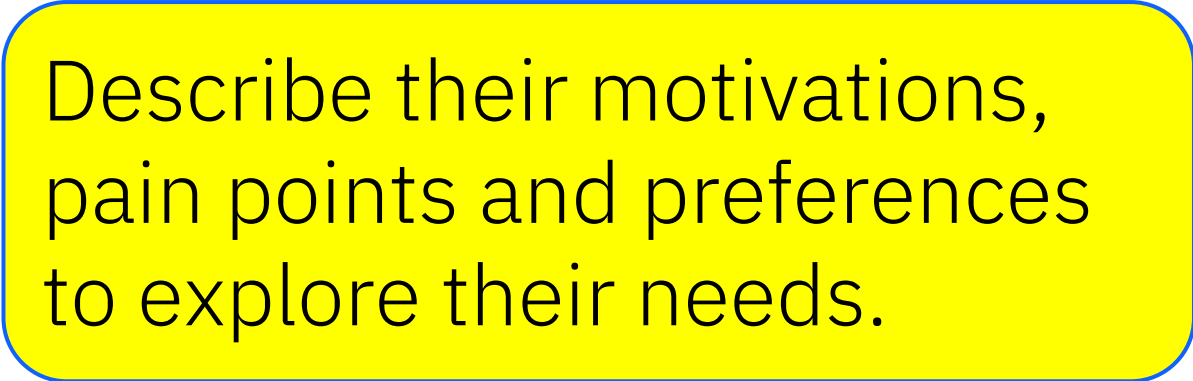
Use a picture to bring your persona to life

Name
Relevant Demographics

Give them a name with demographics to help you empathize

MOTIVATIONS

- Why are they coming to you for information?
- What actions are they trying to inform with your information?

Describe their motivations, pain points and preferences to explore their needs.
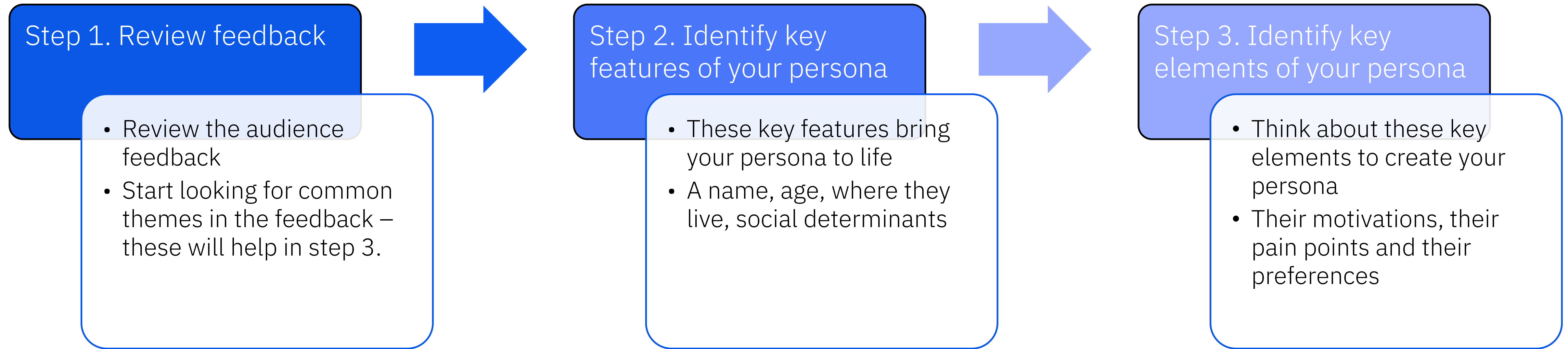
PAIN POINTS

- What are their concerns and worries?
- What makes it difficult for them to get the information they need?

PREFERENCES

- How would they like to get their information?
- What methods of information sharing work best for them?

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1.2 Three steps to create a persona

You can complete these steps in under an hour: ~30 minutes.

Step 1. Review feedback

- Review the audience feedback
- Start looking for common themes in the feedback – these will help in step 3.

Step 2. Identify key features of your persona

- These key features bring your persona to life
- A name, age, where they live, social determinants

Step 3. Identify key elements of your persona

- Think about these key elements to create your persona
- Their motivations, their pain points and their preferences

Personas are *realistic representations* of your audience that can be leveraged to build familiarity, empathy, and understanding of your audience. It is okay to reuse personas for multiple data stories.

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Personas Step 1:
Review Audience Feedback

We received some public feedback about CDC COVID-19 information.

"I am confused when I look at the graphs. What is it telling me? Am I at risk? Is my community at risk?"

"While national information is readily available, it's hard for me to find information about my community."

"I am planning a birthday party in a few weeks but worried about my grandparents. Do you have COVID-19 forecasts?"

"There is a lot of information, but I am overwhelmed. I just want to know if my family is at risk and what I should do."

"The medical jargon is confusing me. Is there a way to share information so us non-experts can understand it?"

Review this feedback and identify themes to help us understand our audience.

Confused & overwhelmed

We need risk information

We need information about our local community

We need recommendations to protect ourselves and others

Share your thoughts in the chat:
- Have you heard similar feedback in your work?
- What are common themes from that feedback?

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Personas Step 2: Identify Key Features

Imagine a specific person who gave us feedback. Find a picture to represent that person and add it to your persona.

Give that person a name and key demographics.

Juliana

Age: 28
Place of Residence: Searcy, Arkansas

MOTIVATIONS

- Why are they coming to you for information?
- What actions are they trying to inform with your information?

PAIN POINTS

- What are their concerns and worries?
- What makes it difficult for them to get the information they need?

PREFERENCES

- How would they like to get their information?
- What methods of information sharing work best for them?

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Personas Step 3: Identify Key Elements

Review the themes you identified in Step 1 and list 3-5 motivations: why are they coming to us for information?

Review the themes you identified in Step 1 and list 3-5 pain points: what makes it difficult for them to get the information they need?

Review the themes you identified in Step 1 and list 3-5 preferences: how would they like to receive the needed information?

Age: 28
Place of Residence: Searcy, Arkansas

MOTIVATIONS

- Wants to protect herself and her family from COVID-19 illness.
- Wants to minimize COVID-19 risk in her community.
- Must support a family member with a respiratory condition.

PAIN POINTS

- Struggles with COVID-19 medical jargon.
- Has difficulty locating COVID-19 risk information for her community.
- Overwhelmed by all the different COVID-19 indicators.

PREFERENCES

- Prefers straightforward language without medical terms.
- Benefits from data shown in infographics that make risk obvious.
- Wants easy to access recommendations to manage risk.
- Values information from reputable, cited sources.

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Juliana

Age: 28

Place of Residence: Searcy, Arkansas

MOTIVATIONS

- Wants to protect herself and her family from COVID-19 illness.
- Wants to minimize COVID-19 risk in her community.
- Must support a family member with a respiratory condition.

PAIN POINTS

- Struggles with COVID-19 medical jargon.
- Has difficulty locating COVID-19 risk information for her community.
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- Prefers straightforward language without medical terms.
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1.3 Use a Needs Statement to define your data story main idea

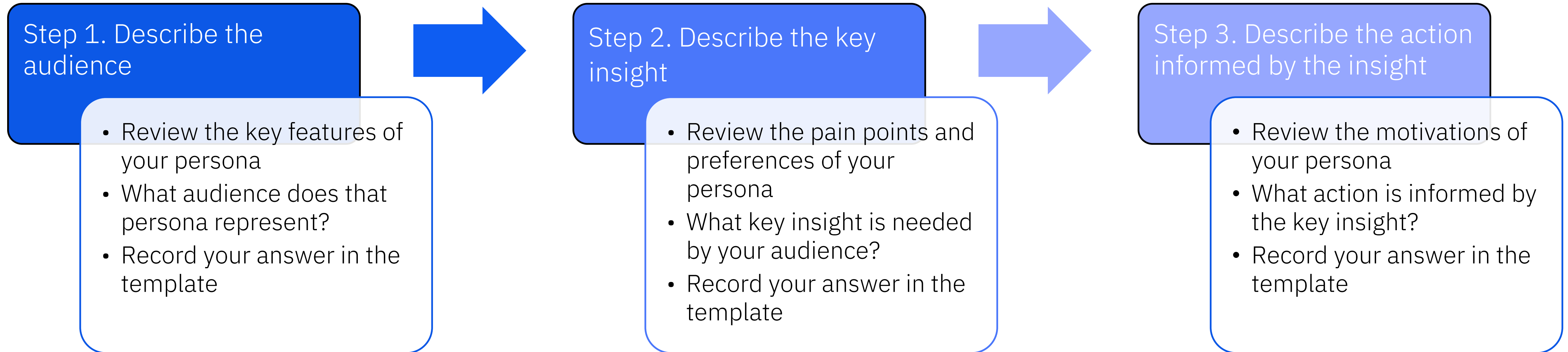A needs statement is the main idea of your story. We use a handy <u>template</u> to capture it.

Here is an <u>example</u> of how that template could be applied to environmental health data storytelling.

<Our audience> need to know
<a key insight> so they can
<take action informed by that insight>.

Coastal residents need to know results of beach biotoxin inspections so they can plan their shellfish gathering weekend.

1.3 Process to create a Needs Statement

You can complete these steps in under an hour: ~30 minutes.

Step 1. Describe the audience

- Review the key features of your persona
- What audience does that persona represent?
- Record your answer in the template

Step 2. Describe the key insight

- Review the pain points and preferences of your persona
- What key insight is needed by your audience?
- Record your answer in the template

Step 3. Describe the action informed by the insight

- Review the motivations of your persona
- What action is informed by the key insight?
- Record your answer in the template

A Needs Statement enables you to quickly name your audience, the key insight they need, and the action informed by that insight. The statement constitutes the main idea of your story.

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Needs Statement Step 1:
What audience does our persona represent?

What audience does Juliana represent?

Describe that audience in the template.

Concerned residents need to know <a key insight> so they can <take action informed by that insight>.

Juliana

Age: 29

Place of Residence: Searcy, Arkansas

Share your thoughts in the chat:
- What other phrases can we use for audience?
- What equity concerns should be addressed?

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Needs Statement Step 2:
What key insight is needed by our audience?

PAIN POINTS

What key insight is implied in the persona pain points and preferences?

- Struggles with COVID-19 medical jargon.
- Has difficulty locating COVID-19 risk information for her community.
- Overwhelmed by all the different COVID-19 indicators.

PREFERENCES

- Prefers straightforward language without medical terms.
- Benefits from data shown in infographics that make risk obvious.
- Wants easy to access recommendations to manage risk.
- Values information from reputable, cited sources.

Describe that key insight in the template.

Concerned residents need to know COVID-19 community health risks so they can <take action informed by that insight>.

Share your thoughts in the chat:
- What other phrases describe key insight?
- Are there other important insights?

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Needs Statement Step 3:
What action is informed by the key insight?

MOTIVATIONS

What informed action is implied by persona motivations?

- Wants to protect herself and her family from COVID-19 illness.
- Wants to minimize COVID-19 risk in her community.
- Must support a family member with a respiratory condition.

Concerned residents need to know COVID-19 community health risks so they can protect themselves and others from COVID-19 illness.

Describe that informed action in the template.

Share your thoughts in the chat:
- What other phrases describe action?
- Are there other actions that could be informed?
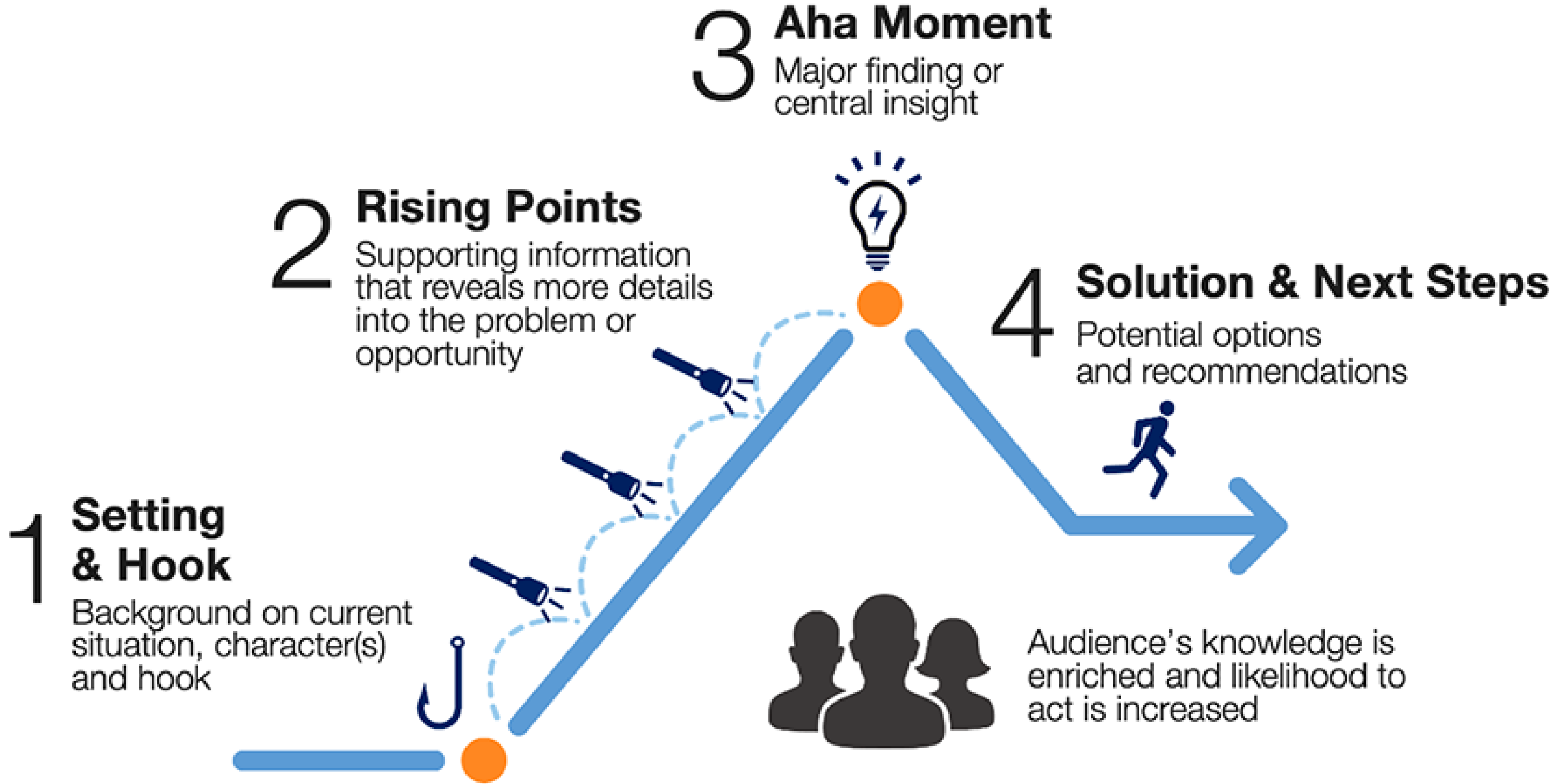
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Concerned residents need to know COVID-19 community health risks so they can protect themselves and others from COVID-19 illness.

1.4 Use a storyboard to craft a compelling storyline
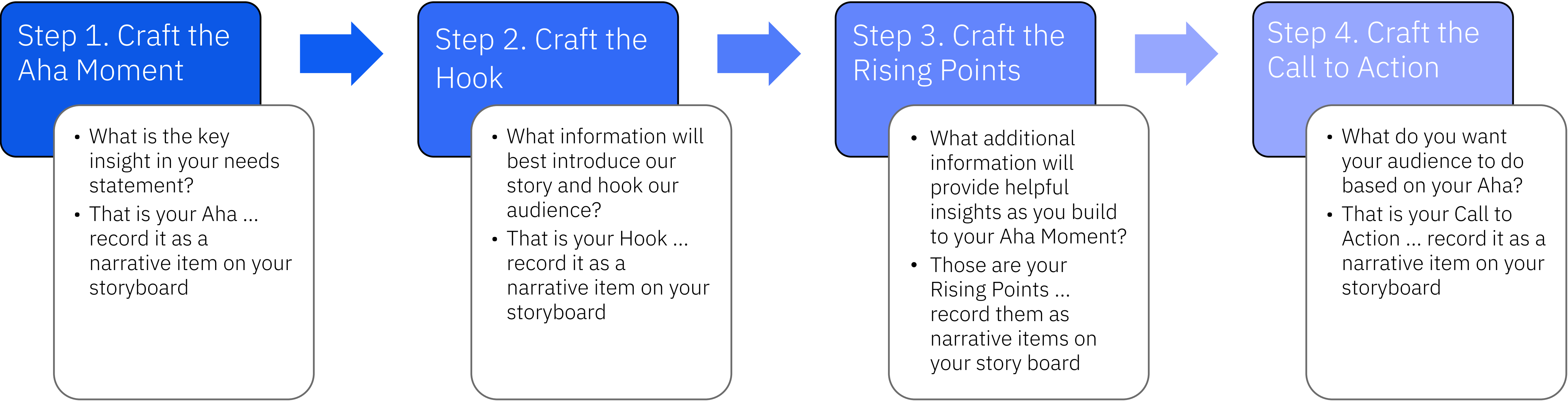

Brent Dykes, Author
Effective Data Storytelling

Data Storytelling Arc™

1 Setting & Hook — Background on current situation, character(s) and hook

2 Rising Points — Supporting information that reveals more details into the problem or opportunity

3 Aha Moment — Major finding or central insight

4 Solution & Next Steps — Potential options and recommendations

Audience's knowledge is enriched and likelihood to act is increased

Effectivedatastorytelling.com

1.2 Four steps to craft a compelling storyline

You can complete these steps in about an hour.

Step 1. Craft the Aha Moment

- What is the key insight in your needs statement?
- That is your Aha … record it as a narrative item on your storyboard

Step 2. Craft the Hook

- What information will best introduce our story and hook our audience?
- That is your Hook … record it as a narrative item on your storyboard

Step 3. Craft the Rising Points

- What additional information will provide helpful insights as you build to your Aha Moment?
- Those are your Rising Points … record them as narrative items on your story board

Step 4. Craft the Call to Action

- What do you want your audience to do based on your Aha?
- That is your Call to Action … record it as a narrative item on your storyboard

Storyboards are a useful tool for identifying the important narrative elements of your data story. You can use Brent Dyke's Data Storytelling Arc™ to order those elements into a compelling storyline.

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Storyline Step 1:
What is our Aha Moment?

Identify the key insight articulated in our needs statement.

Concerned residents need to know COVID-19 community health risks so they can protect themselves and others from COVID-19 illness.

Building Our Storyboard

COVID-19 risk level in <Community> is <Low, Medium, High>.
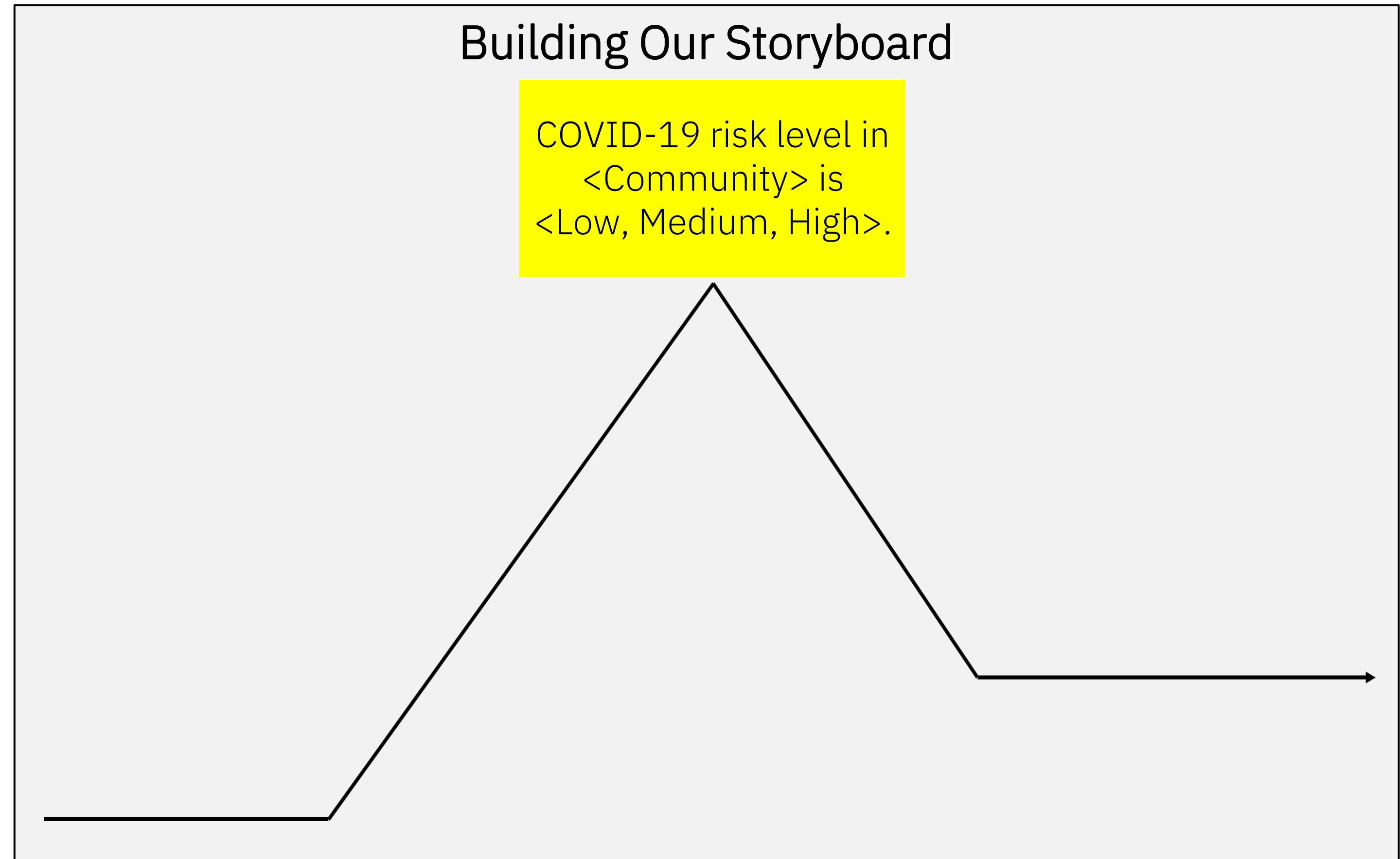
Share your thoughts in the chat:
- What other ways could we describe the Aha?
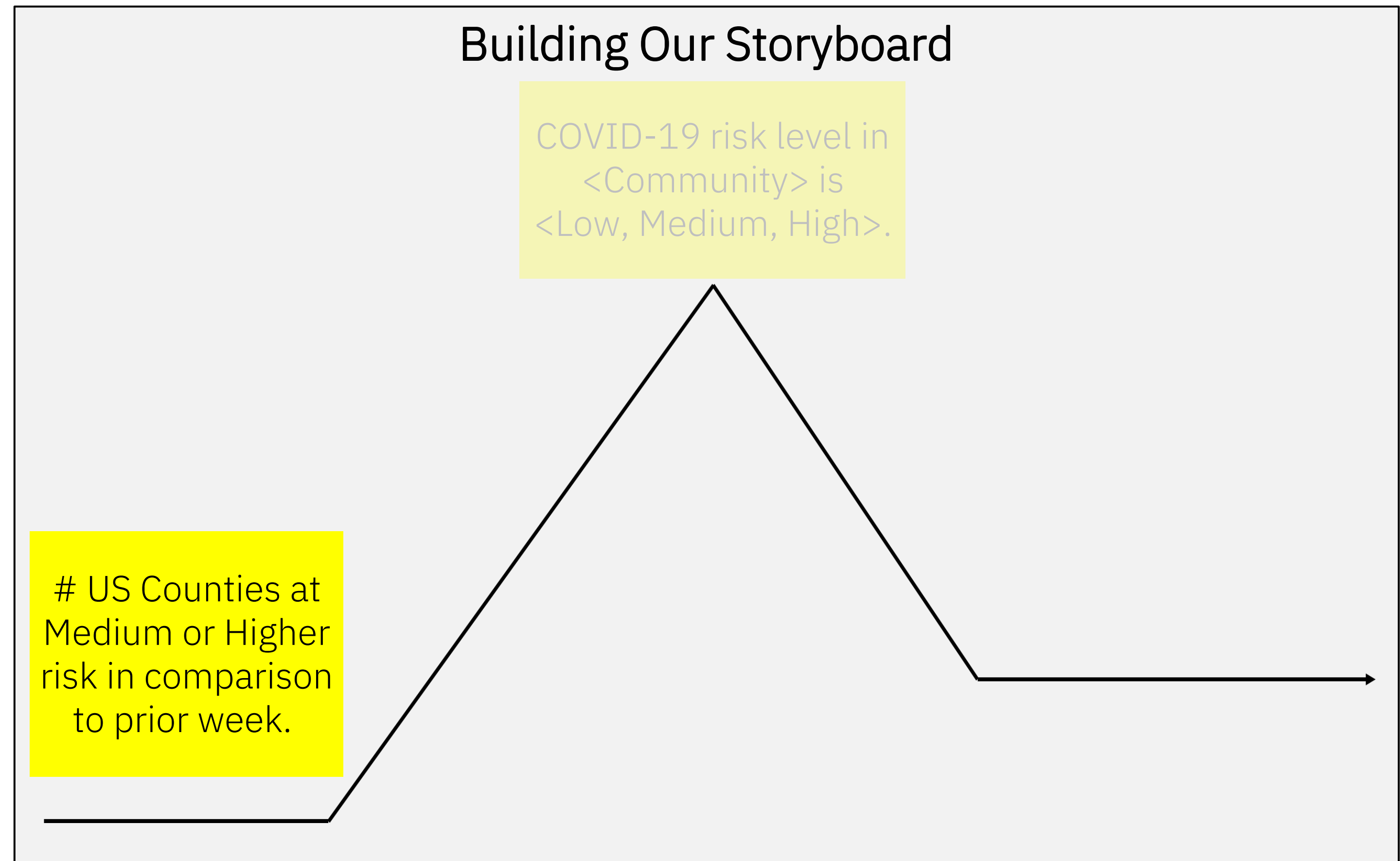- What Aha's do you see in your own work?

Storyline Step 2: What is our Hook?

Brainstorm ideas for the hook and pick the best one.

HOOK BRAINSTORM

- National COVID-19 emergency department visits indicate <Low, Medium, High> risk and are trending <Lower, Stable, Higher>.

- National COVID-19 hospitalization rates indicate <Low, Medium, High> risk and are trending <Lower, Stable, Higher>.

- <X> number of US Counties are at Medium or High COVID-19 risk and Counties at elevated risk are <Lower, Stable, Higher> compared to last week.

Share your thoughts in the chat:
- What do you think makes the best Hook?
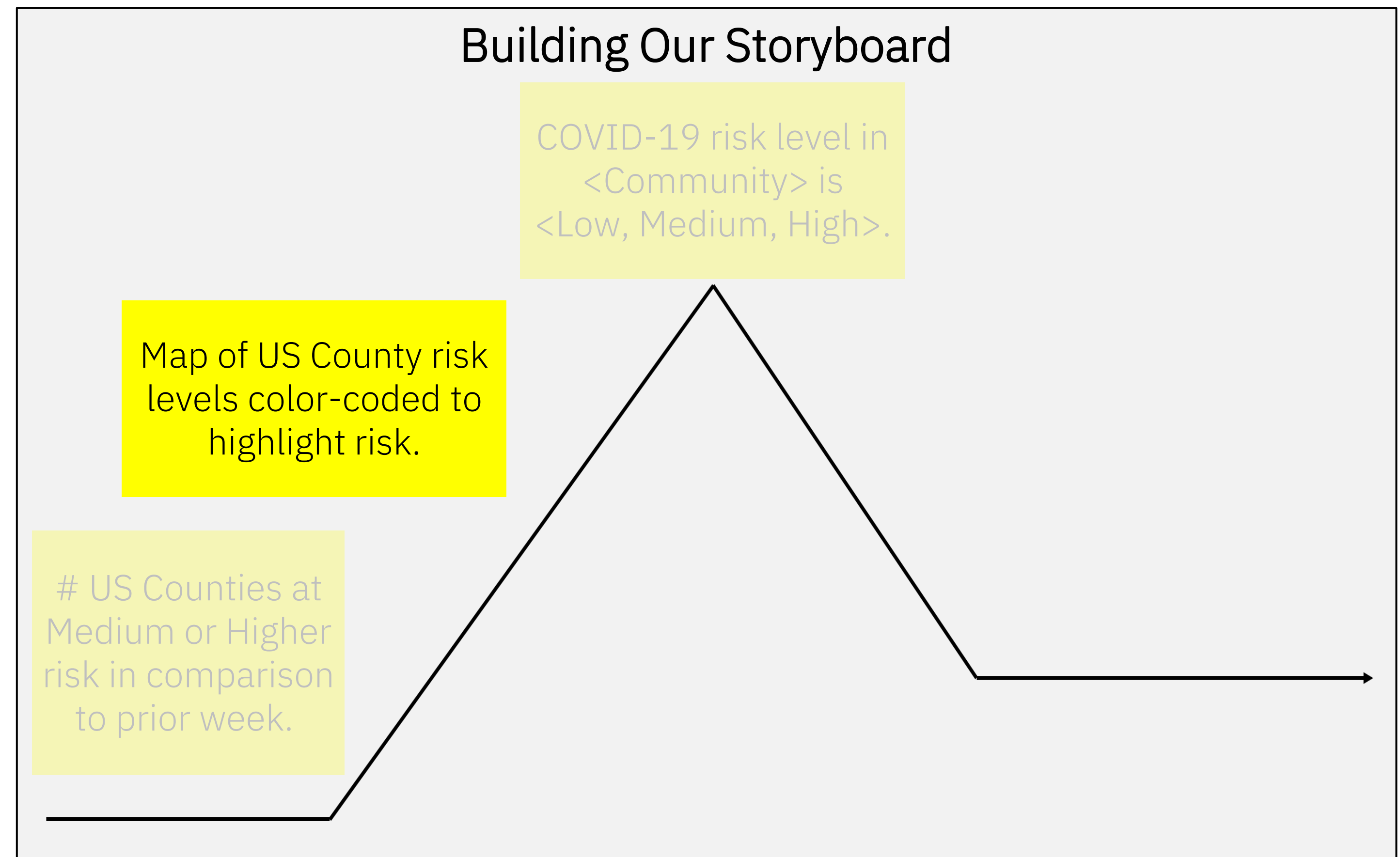- What Hooks do you see in your own work?

Building Our Storyboard

COVID-19 risk level in <Community> is <Low, Medium, High>.

US Counties at Medium or Higher risk in comparison to prior week.

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Storyline Step 3:
What are our Rising Points?

Brainstorm ideas for rising points and pick the best.

RISING POINTS BRAINSTORM

- Here is the list of the US counties at medium or higher risk.

- Here is the map of all US counties colored by risk level.

- Here is a filter for you to select your county to see its risk.

Building Our Storyboard

COVID-19 risk level in <Community> is <Low, Medium, High>.

Map of US County risk levels color-coded to highlight risk.

US Counties at Medium or Higher risk in comparison to prior week.

Share your thoughts in the chat:
- What do you think makes the best Rising Point?
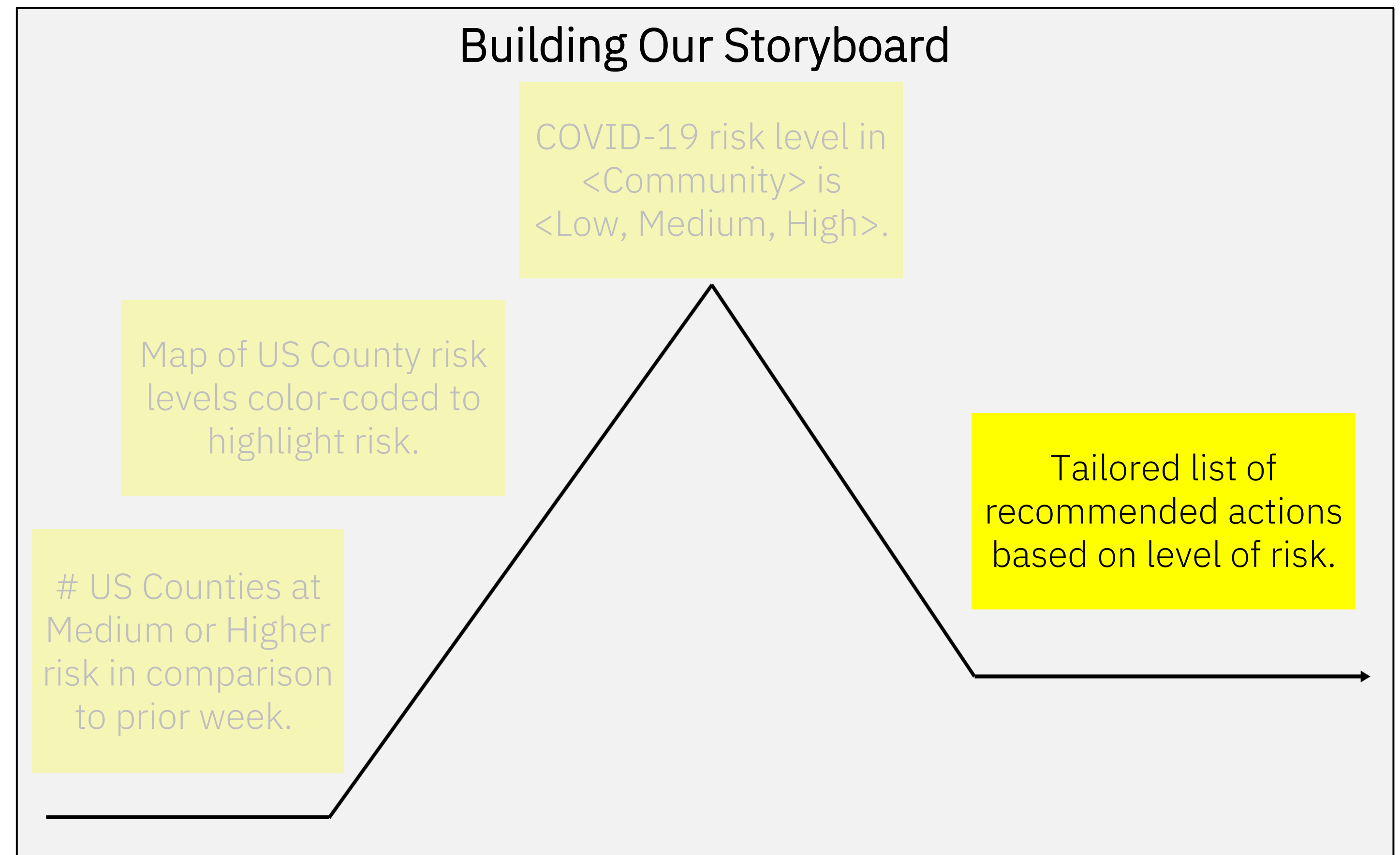- What Rising Points do you see in your own work?

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Storyline Step 4:
What is our Call to Action?

Brainstorm ideas for call to action and pick the best.

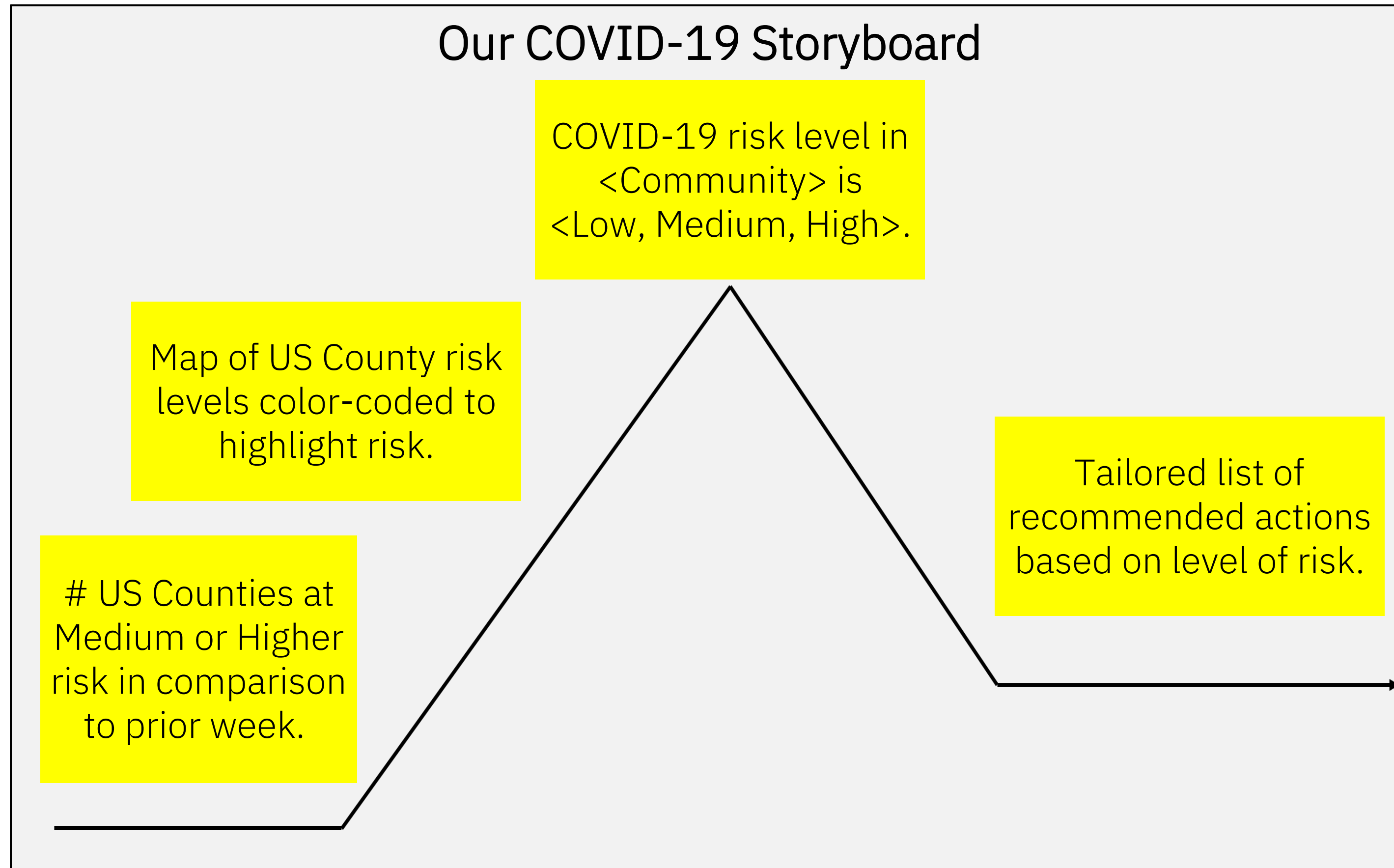## CALL TO ACTION BRAINSTORM

- Here is a list of healthy behaviors to help mitigate COVID-19 risk.

- Based on the level of risk in your community, here is what you should do to protect yourself and others.

- You should stay current on COVID-19 vaccines and wear a high-quality mask while in public.

Building Our Storyboard

COVID-19 risk level in <Community> is <Low, Medium, High>.

Map of US County risk levels color-coded to highlight risk.

Tailored list of recommended actions based on level of risk.

US Counties at Medium or Higher risk in comparison to prior week.

Share your thoughts in the chat:
- What do you think makes the best call to action?
- What call to action do you see in your own work?

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1.4 A completed storyboard and example storyline

Our COVID-19 Storyboard

COVID-19 risk level in <Community> is <Low, Medium, High>.

Map of US County risk levels color-coded to highlight risk.

Tailored list of recommended actions based on level of risk.

US Counties at Medium or Higher risk in comparison to prior week.

An Example Storyline Using the Storyboard

1. **HOOK:** COVID-19 risks are MEDIUM or HIGH in 402 US counties. More counties are at elevated risk this week compared to last week.

2. **RISING POINT:** A cluster of counties in North Central Arkansas are at HIGH risk of COVID-19 illness.

3. **AHA MOMENT:** White County Arkansas is at HIGH risk of COVID-19 illness.

4. **CALL TO ACTION:** Residents of White County Arkansas should take the following actions to protect themselves and others from COVID-19 illness ...

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Module 1: Audience & Storyline Recap

You learned about different methods of audience engagement

You learned how to create a persona to describe your audience

You learned how to use needs statements to define the main idea of your story

You learned how to use a storyboard to create compelling storylines

Module 2 Preview: next week you will learn how to draft a data story and get feedback to finalize that story

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Module 1 Additional resources

Here are links to additional resources if you want to explore these topics further.

Personas
- [How to Use Personas and Scenarios for Storytelling (linkedin.com)](#)
- [Master Story, Master UX (Designerup)](#)
- [Personas - A Simple Introduction (Interactive Design Foundation)](#)

Other Techniques to engage you audience
- [Empathy map (IBM)](#)
- [Empathy mapping: A guide to getting inside a user's head (UX Booth)](#)
- [Empathy Mapping: The first step in design thinking (NN/group)](#)
- [What is co-design?](#)
- [Co-designing engaging and accessible data visualizations](#)

Create a storyboard and stories
- [Storytelling with data (Knaflic)](#)
- [Nancy Duarte blog articles](#)
- [Hands on Data Viz - Build a narrative on a storyboard](#)
- [Effective Data Storytelling by Brent Dykes](#)
- [Data-Stories | Environment & Health Data Portal](#)

Other resources
- [Public Health Communications Toolkit](#)
- [Health Communication Playbook](#)
- [Public health communication lessons from Covid](#)

1.5 Module 1: Hands on practice activities

You will now have a chance to practice what you have learned. There are three scenarios that you can choose from. Each scenario has template that you will fill out as you go through the steps of creating a persona, creating a needs statement and ultimately creating a storyboard. The first two also have sample data and a sample answer.

Here are the three scenarios and the links to get you the documents.

1. Prebuilt cancer scenario
    1. Activity template
    2. Sample answer

2. Prebuilt opioid overdose scenario
    1. Activity template
    2. Sample answer

3. Choose your own data and scenario
    1. Activity template

Washington State Department of
HEALTH