

From Pixels to Progress:

Setting the stage for data-driven decision-making on ACEs and PCEs

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A young boy with short, dark hair is shown in profile, looking upwards and to the right with a thoughtful expression. He is wearing a light-colored shirt with thin, dark horizontal stripes. In the background, the profile of a woman with dark hair is visible, looking towards the boy. The scene is dimly lit, with a blue and purple color cast. The background shows a window with a white frame and some dark curtains.

01 /

What are ACEs?

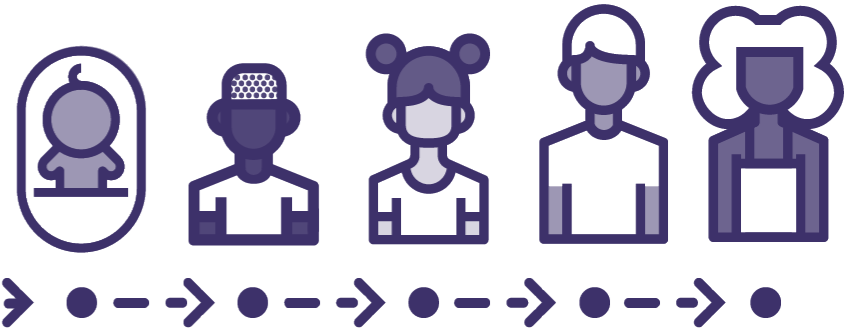
What Are Adverse Childhood Experiences?

Adverse childhood experiences, or **ACEs**, mean **potentially traumatic events in childhood (0-17 years)** such as neglect and experiencing or witnessing violence.



ACEs can negatively impact physical, mental, emotional, and behavioral development.

- ACEs can also have lasting effects on health, well-being, and prosperity well into adulthood.



ACEs Can Accumulate and Their Effects Last Beyond Childhood

The effects of ACEs can add up over time and affect a person throughout their life.

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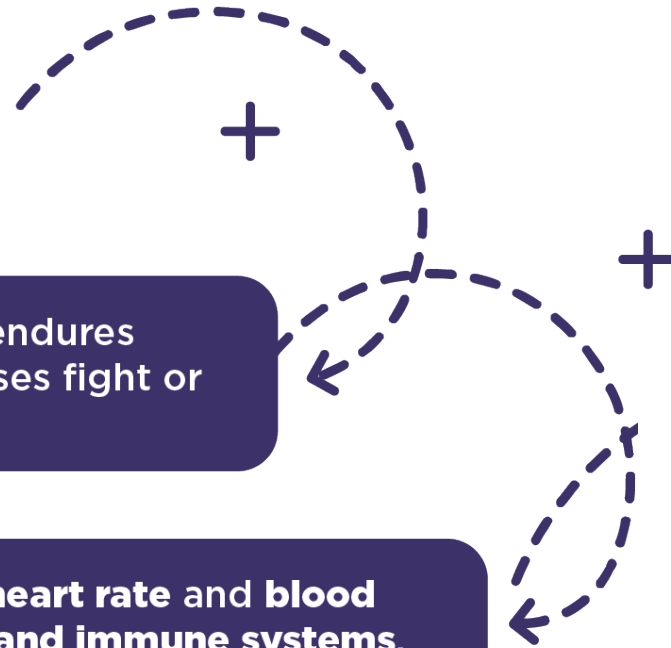
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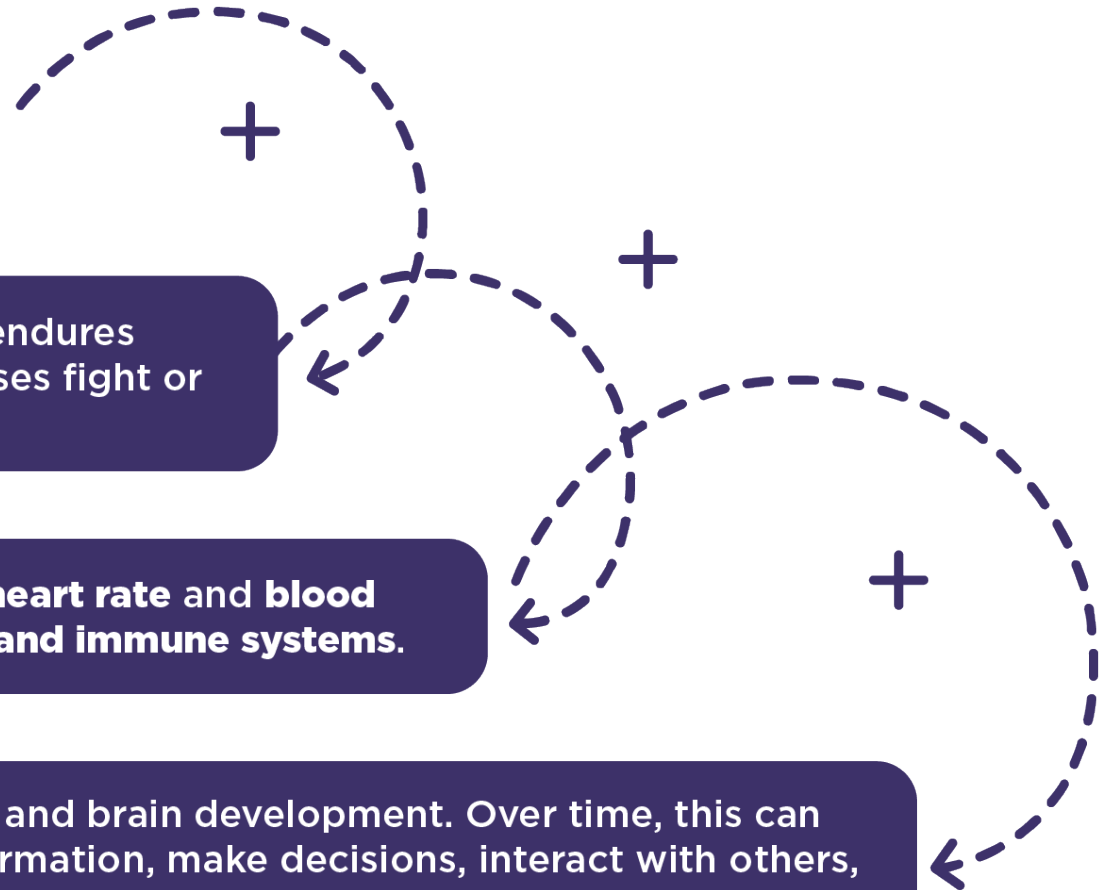
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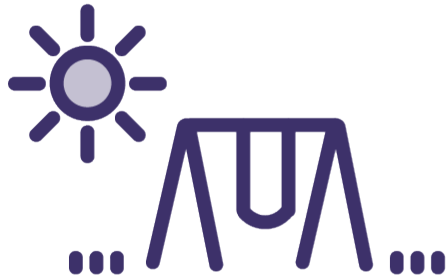


Toxic stress can disrupt organ, tissue, and brain development. Over time, this can limit a person's ability to process information, make decisions, interact with others, and regulate emotions. **These consequences may follow a person into adulthood.**



ACEs Can Echo Across Generations

The consequences of ACEs can **be passed down from one generation to the next** if children don't have protective buffers like...



positive
childhood
experiences

OR



a caring
adult in
their lives.

Also, when families experience **historical and systemic racism** or living in **poverty for generations**, the effects of ACEs can add up over time.

Types of ACEs



ABUSE

- Emotional
- Physical
- Sexual



NEGLECT

- Emotional
- Physical



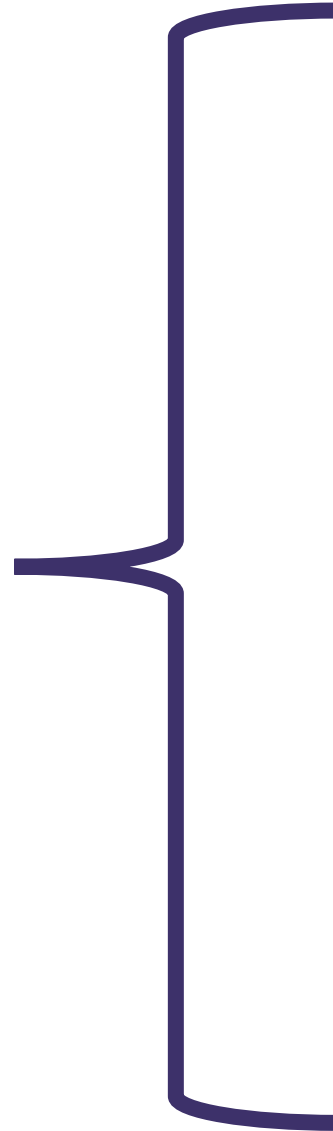
HOUSEHOLD CHALLENGES*

- Substance misuse
- Mental illness
- Suicidal thoughts and behavior
- Divorce or separation
- Incarceration
- Intimate partner violence or domestic violence

**“CORE”
ACEs**

* The child lives with a parent, caregiver, or other adult who experiences one or more of these challenges.

“EXPANDED” ACEs



Other Adversity



- Bullying
- Community violence
- Natural disasters
- Refugee or wartime experiences
- Witnessing or experiencing acts of terrorism
- Teen dating violence

The Pair of ACEs

Adverse Childhood Experiences

Maternal Depression

Emotional & Sexual Abuse

Substance Abuse

Domestic Violence

Incarceration

Mental Illness

Divorce

Physical & Emotional Neglect

Adverse Community Environments

Community Disruption

Lack of Opportunity, Economic Mobility, & Social Capital

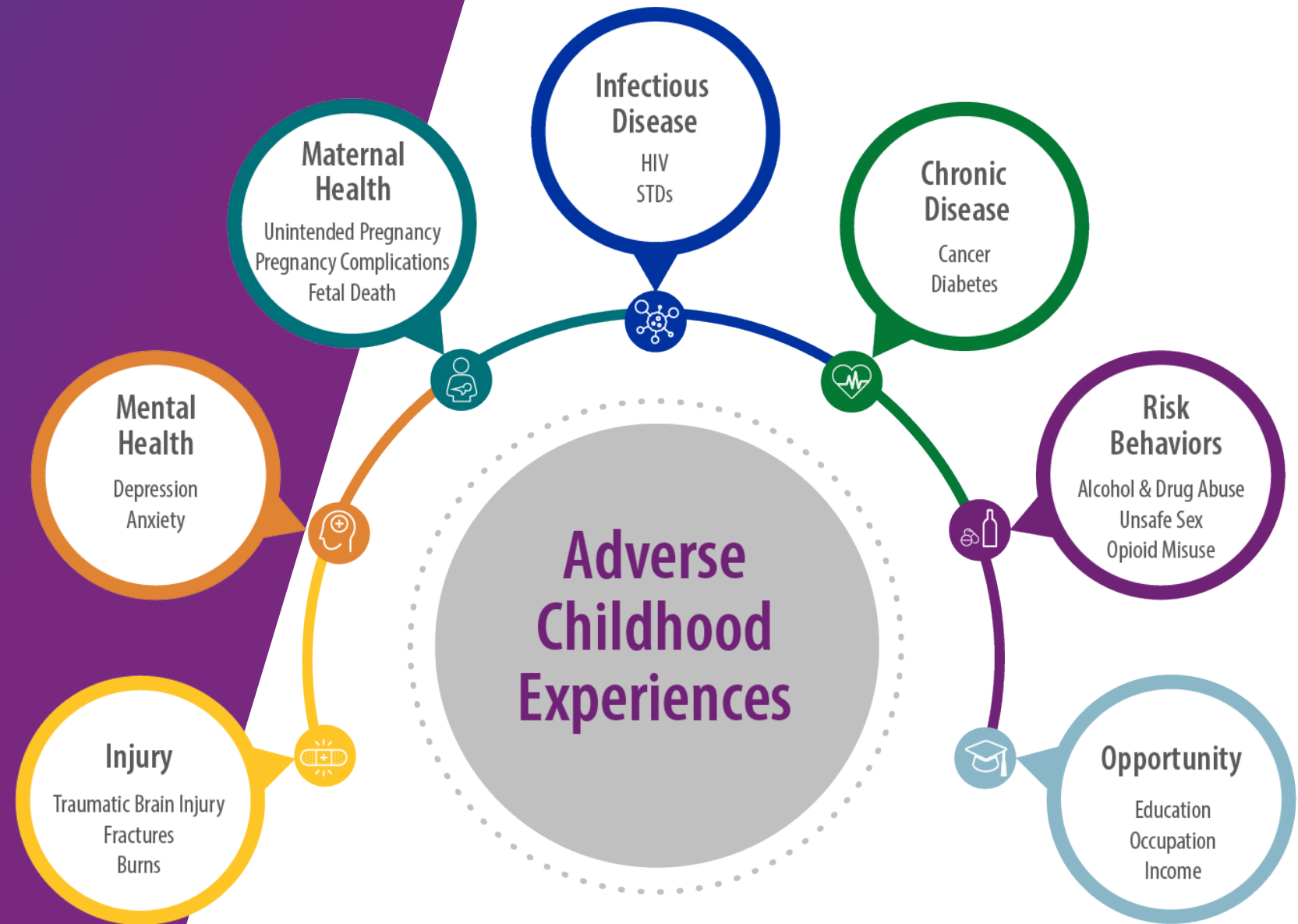
Poor Housing Quality and Affordability

Poverty

Violence

Discrimination

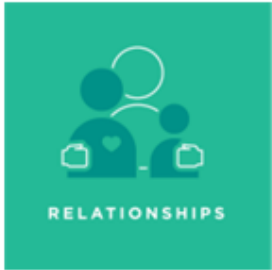
Early Adversity has Lasting Impacts Across the Lifespan



A photograph of a diverse group of people holding hands in a circle, viewed from above. The image is overlaid with a semi-transparent blue and purple gradient. The text '02 /' is positioned on the left side of the image.

02 /

What are PCEs?



Relationships

Relationships within the family and with other children and adults through interpersonal activities



Environment

Safe, equitable, stable environments for living, playing, learning at home and in school



Engagement

Social and civic engagement to develop a sense of belonging and connectedness



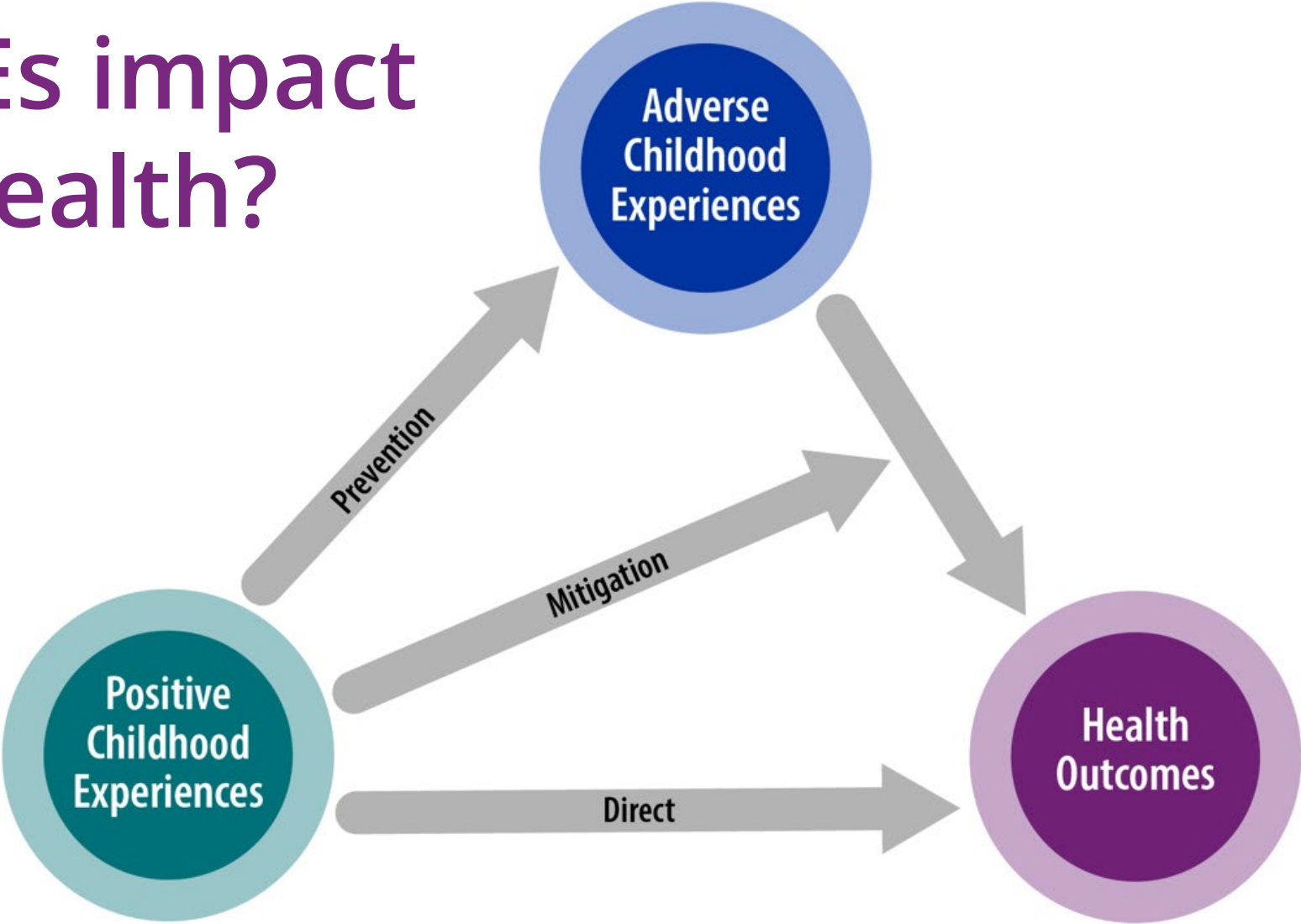
Emotional Growth

Emotional growth through playing and interacting with peers for self-awareness and self-regulation

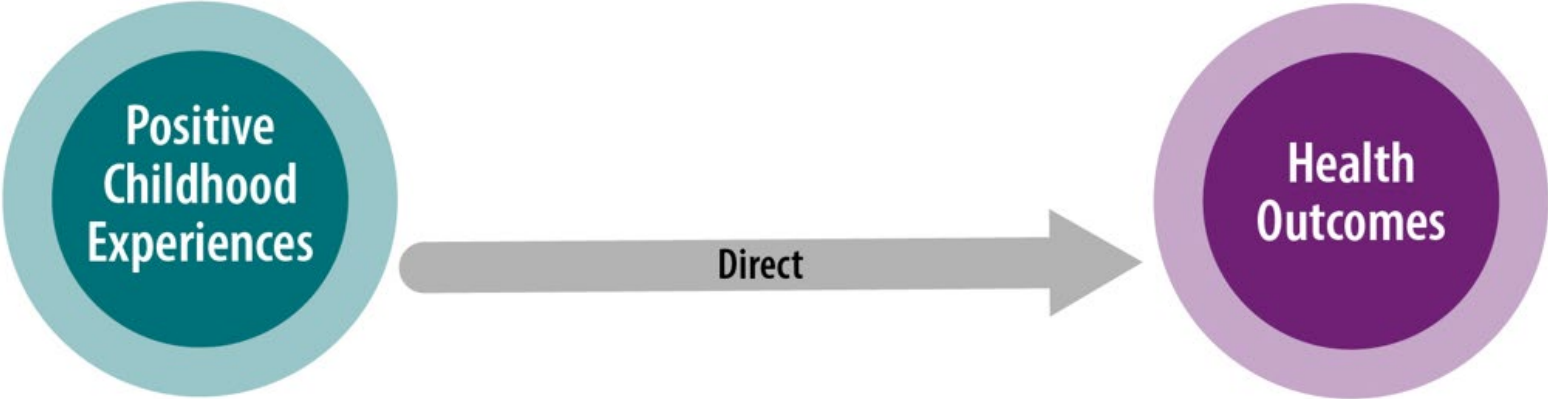
Positive Childhood Experiences (PCEs)

- + PCEs are experiences during childhood that promote safe, stable, and nurturing relationships and environments.
- + PCEs can help children develop a sense of belonging, connectedness, and build resilience.

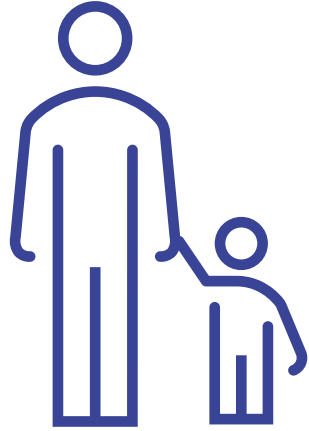
How do PCEs impact children's health?



How do PCEs impact children's health?



Direct Effects of Selected PCEs



Positive parent/caregiver relationships improve emotional regulation, and cognitive function. They also reduce risk for low self-esteem, substance use, and violent behavior.

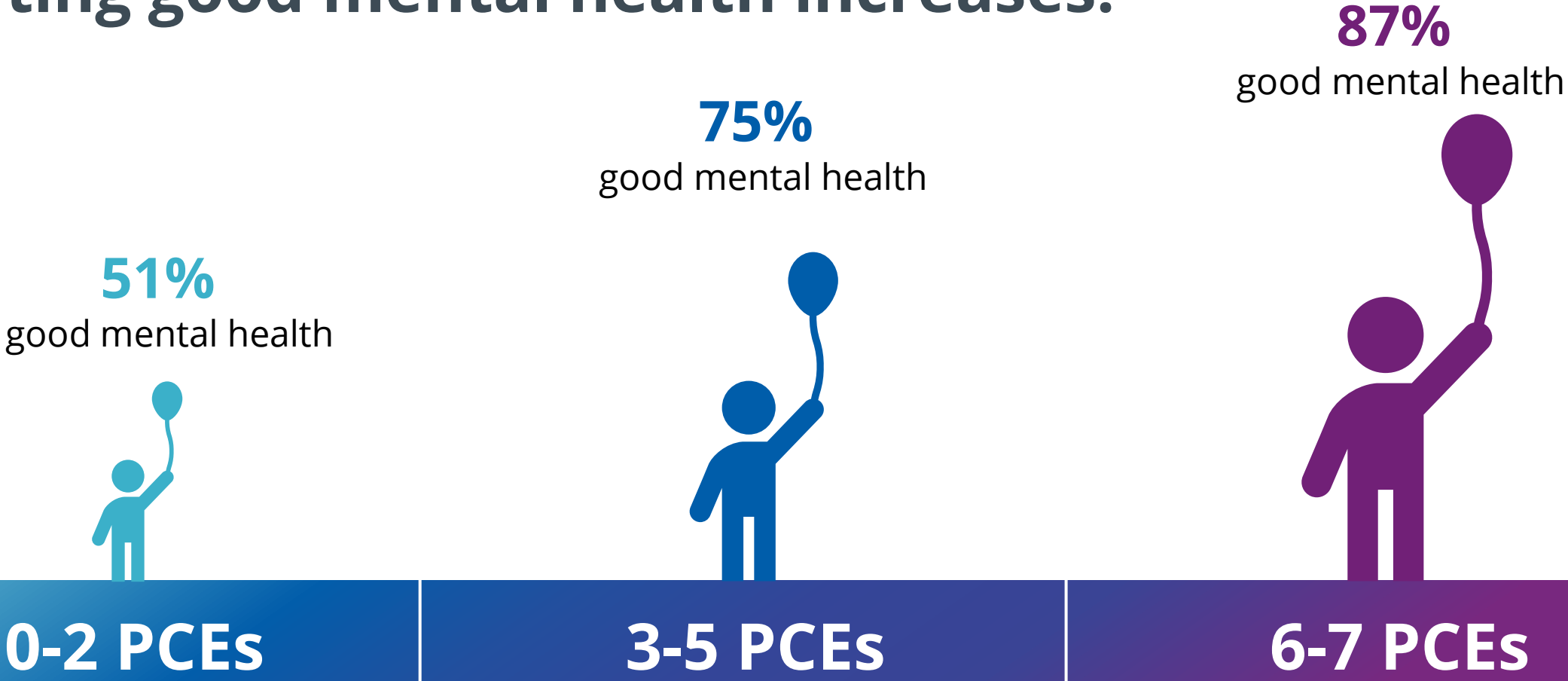


Friendships cultivate belongingness. A sense of belonging at school or in the community is associated with less distress, substance use, suicidality, and violent behavior.



Having a non-familial trusted adult, or a mentor, can have positive impacts on mental health, academic engagement, and reduce substance use.

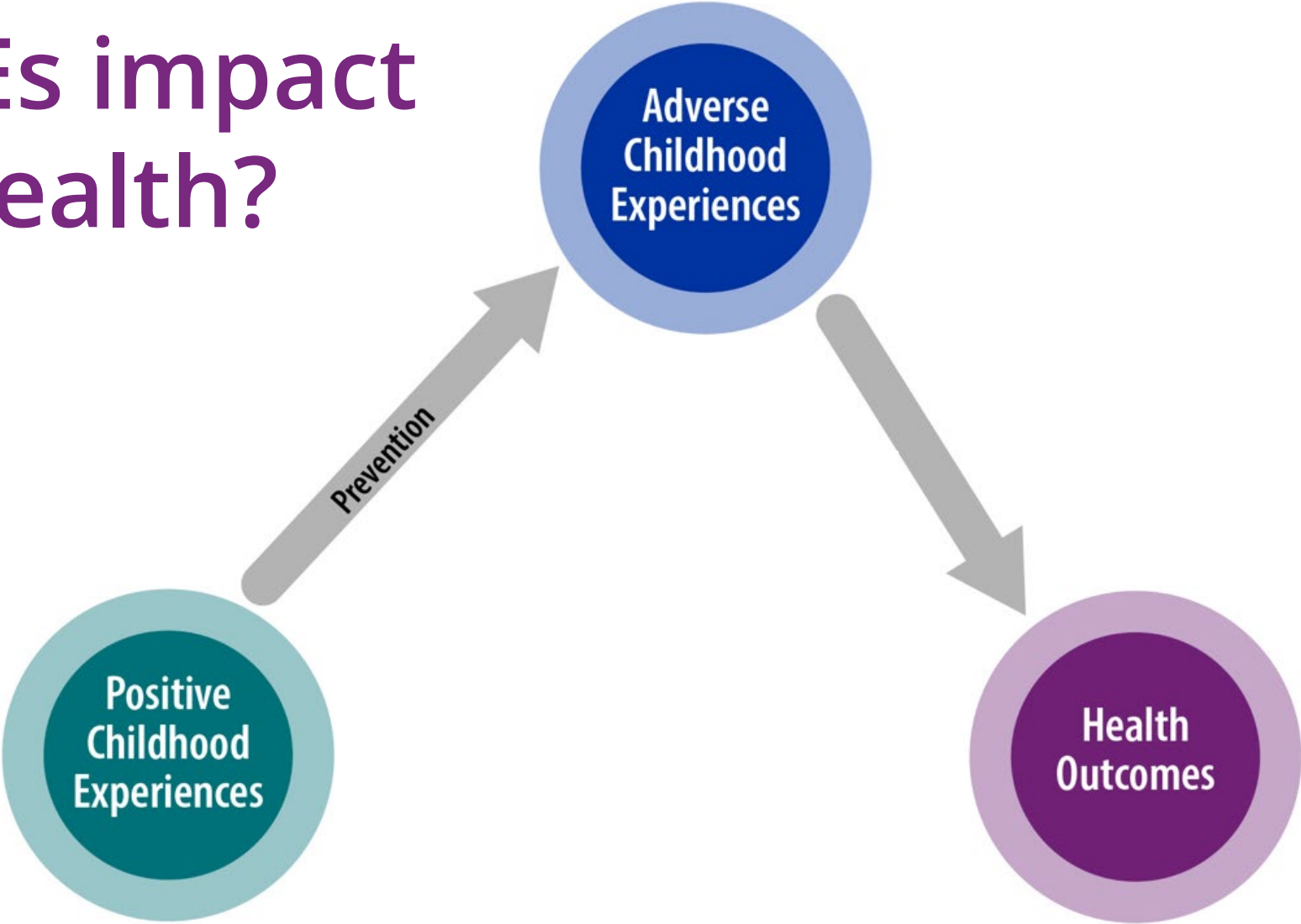
As number of PCEs increases, the percent of people reporting good mental health increases.



***Good mental health – those not reporting depression or poor mental health
Wisconsin BRFSS, 2015***

Source: Bethell C, Jones J, Gombojav N, Linkenbach J, Sege R. Positive Childhood Experiences and Adult Mental and Relational Health in a Statewide Sample: Associations Across Adverse Childhood Experiences Levels. JAMA Pediatr. 2019 Sep 9; e193007

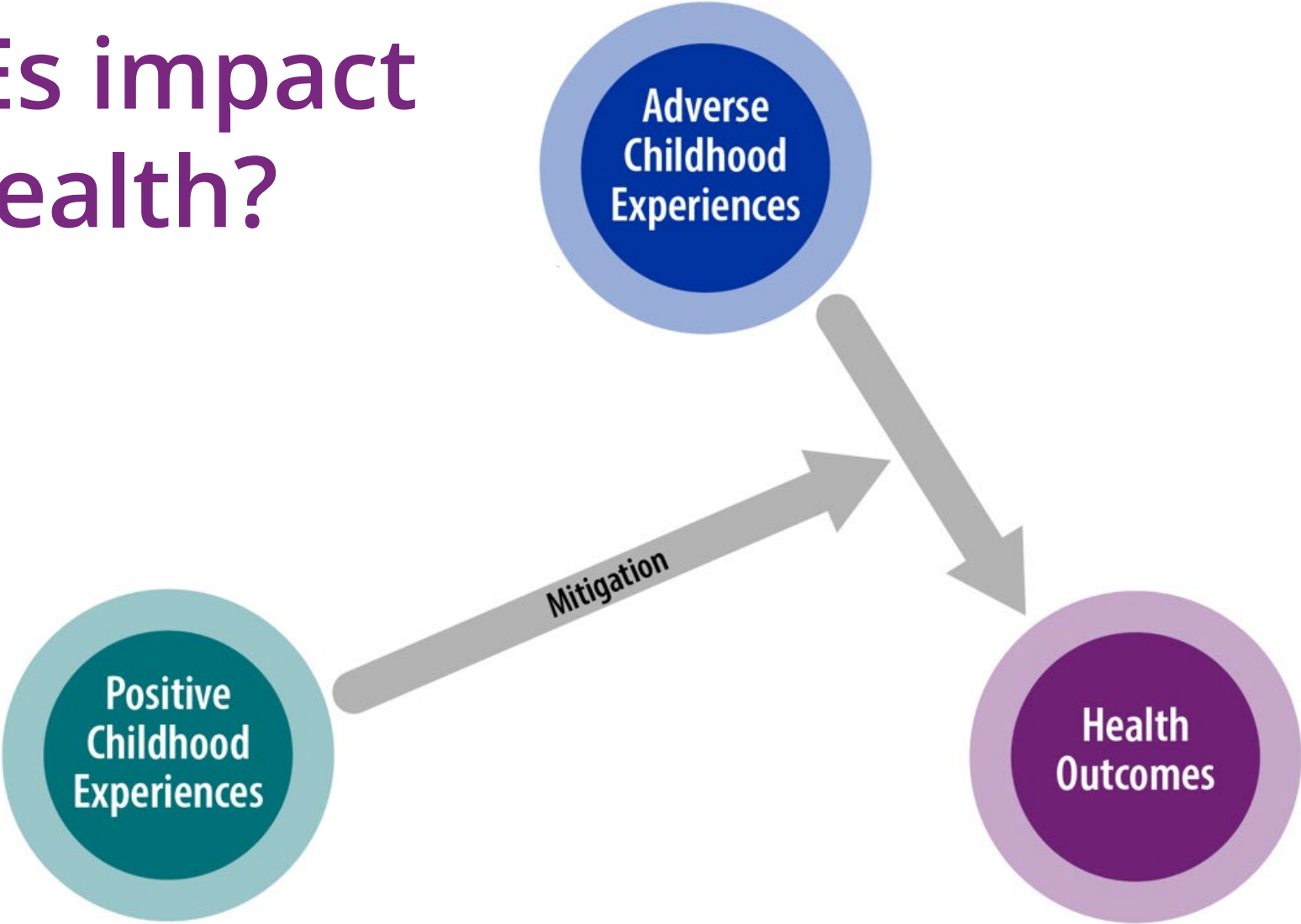
How do PCEs impact children's health?



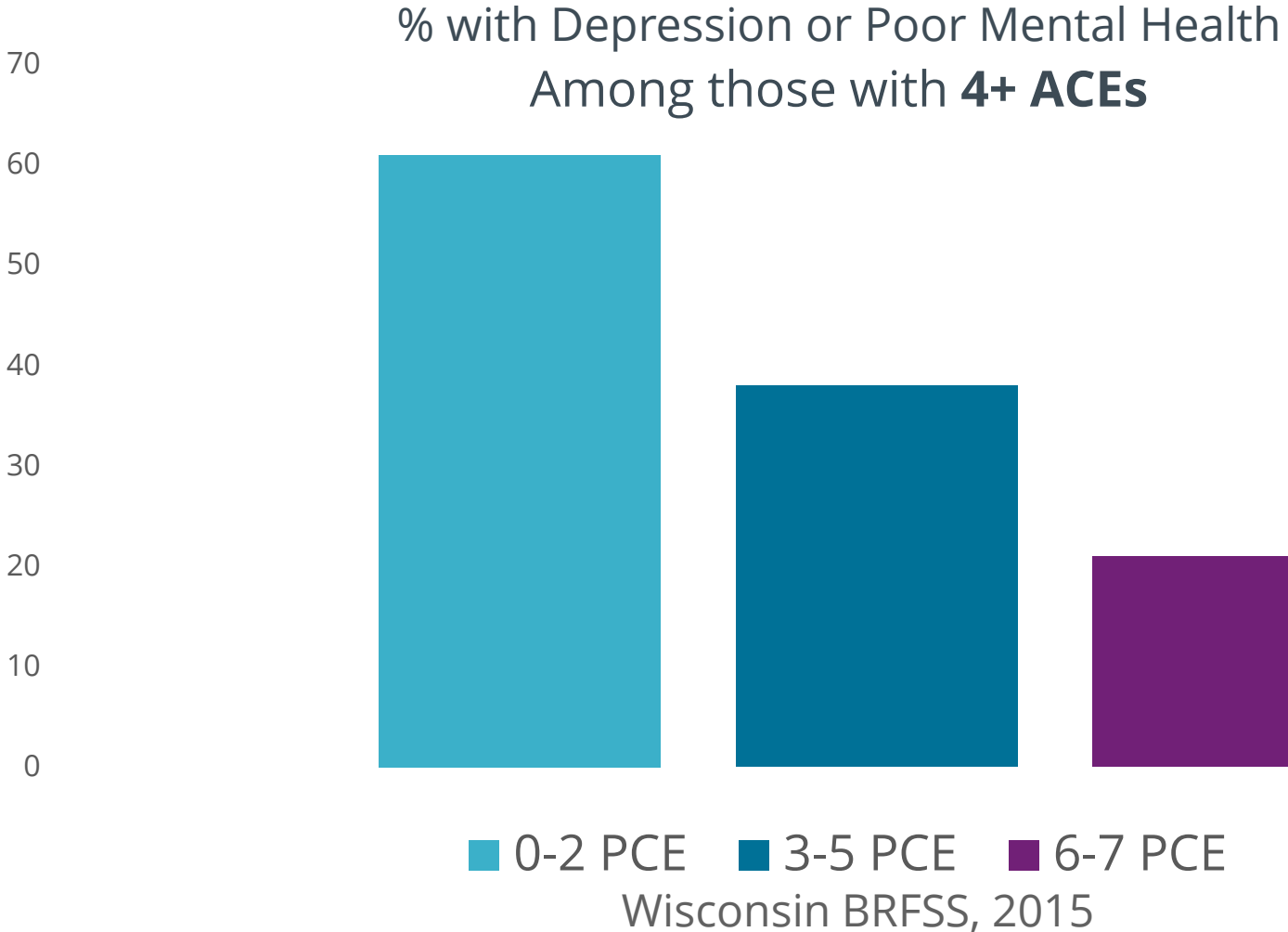


Prevention Effects of PCEs on ACEs

How do PCEs impact children's health?



Positive Childhood Experiences Mitigate ACEs Effects



Source: Bethell C, Jones J, Gombojav N, Linkenbach J, Sege R. Positive Childhood Experiences and Adult Mental and Relational Health in a Statewide Sample: Associations Across Adverse Childhood Experiences Levels. JAMA Pediatr. 2019 Sep 9; e193007



03 /

Surveillance Data Sources

Considerations for Selecting Data

- + Timeliness**
- + Measures of interest**
- + Covariates of interest**
- + Geographic level**
- + Respondent type**
- + Potential for bias**

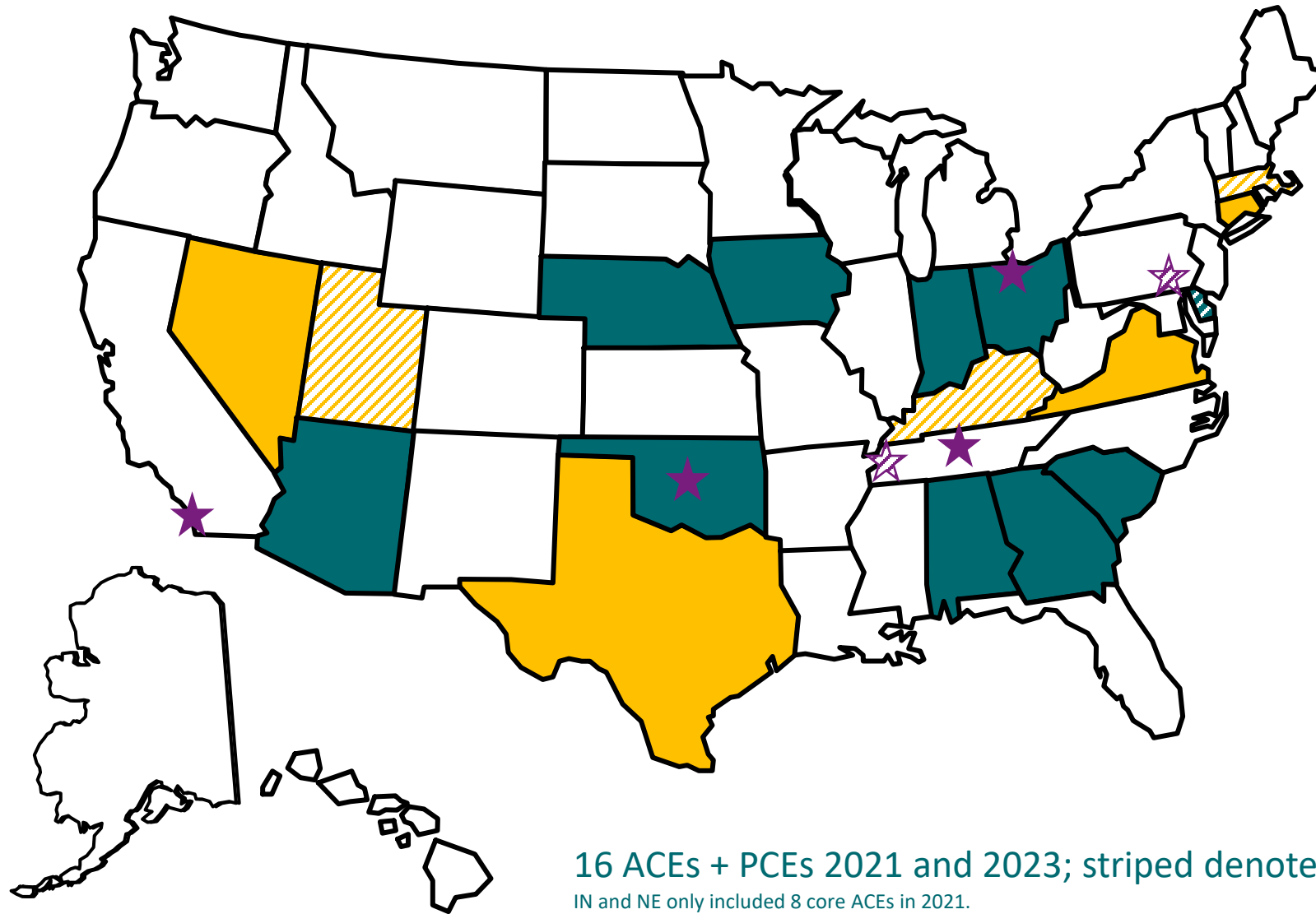
Youth Risk Behavior Surveillance System (YRBSS)



Geography

- Local
- State
- National

2021 AND 2023 – NCIPC Funded Participation in YRBS ACEs + PCEs content



16 ACEs + PCEs 2021 and 2023; striped denotes inclusion in just one year.

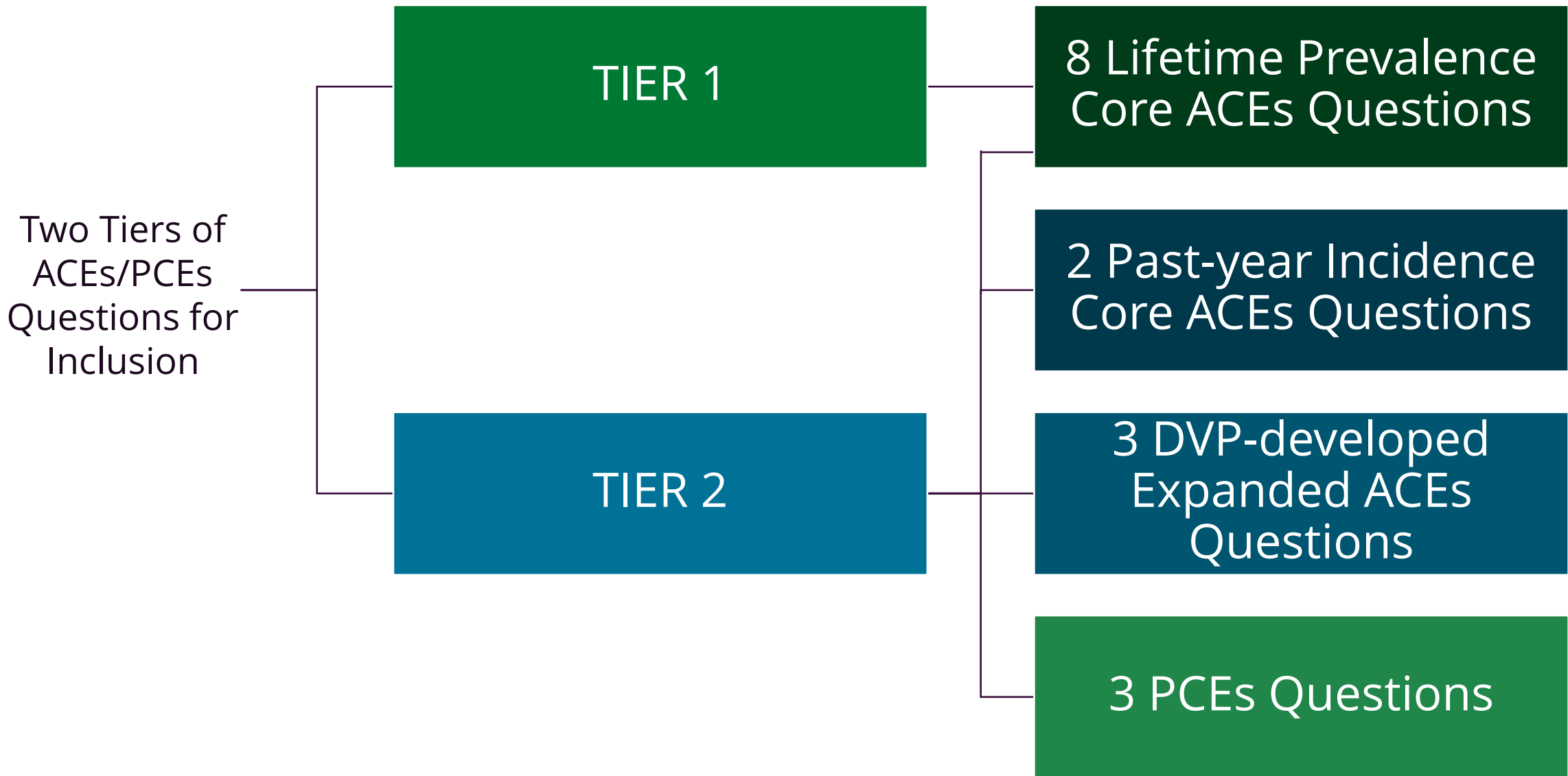
IN and NE only included 8 core ACEs in 2021.

8 ACEs (Core) 2021 and 2023; striped denotes inclusion in just one year

★ 16 ACEs & PCEs in Local District or Tribal Survey, 2021 and 2023. Striped denotes inclusion in just one year.

ACEs & PCEs Variables Available

- Core ACEs
- Expanded ACEs
- PCEs



Covariates

- Demographics
- Risk behaviors
- Outcomes

BENEFITS

Youth reported

Proximity to exposure

Risk behaviors and health outcomes

CHALLENGES

Space on survey

Availability of YRBS by jurisdiction

Limited social determinants of health

Cross-sectional

Behavioral Risk Factor Surveillance System (BRFSS)

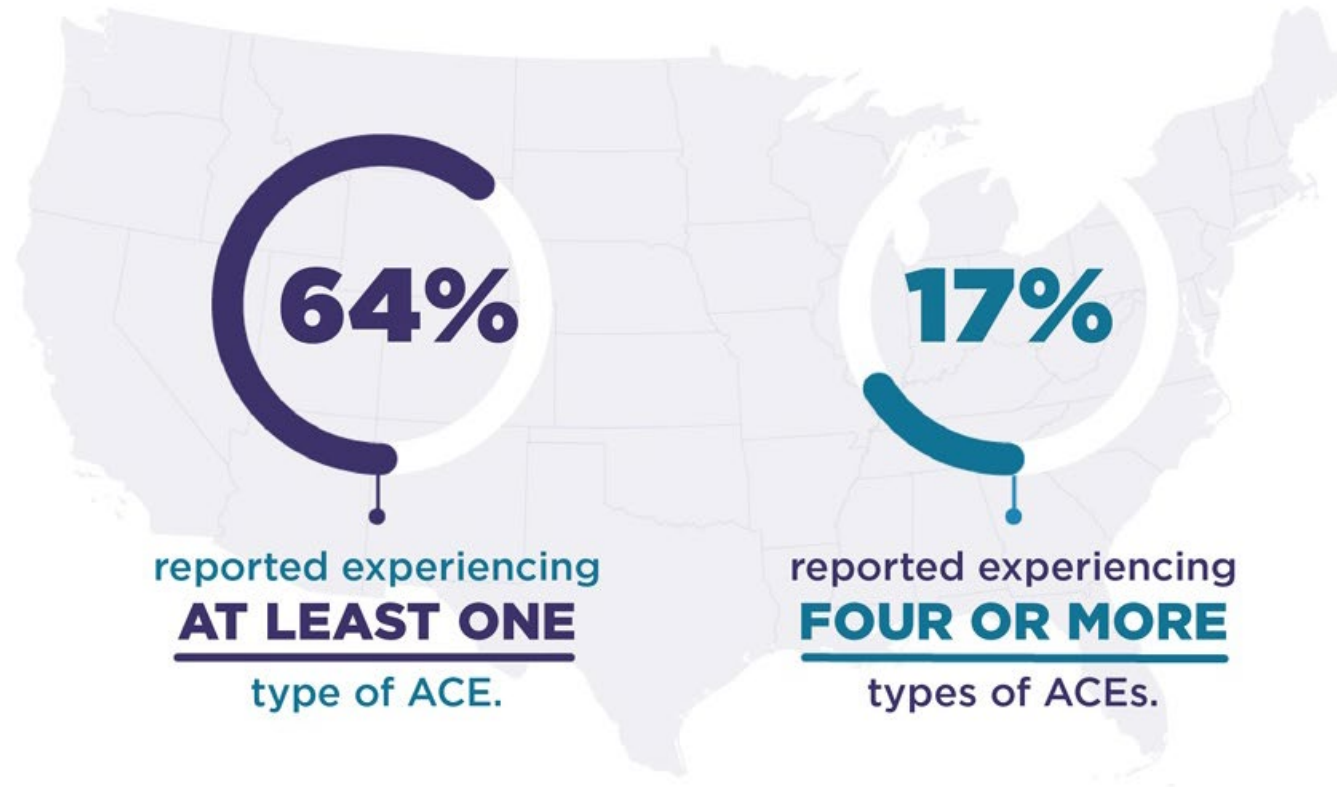


Geography

- State
- National(ish)

Many People Report ACEs

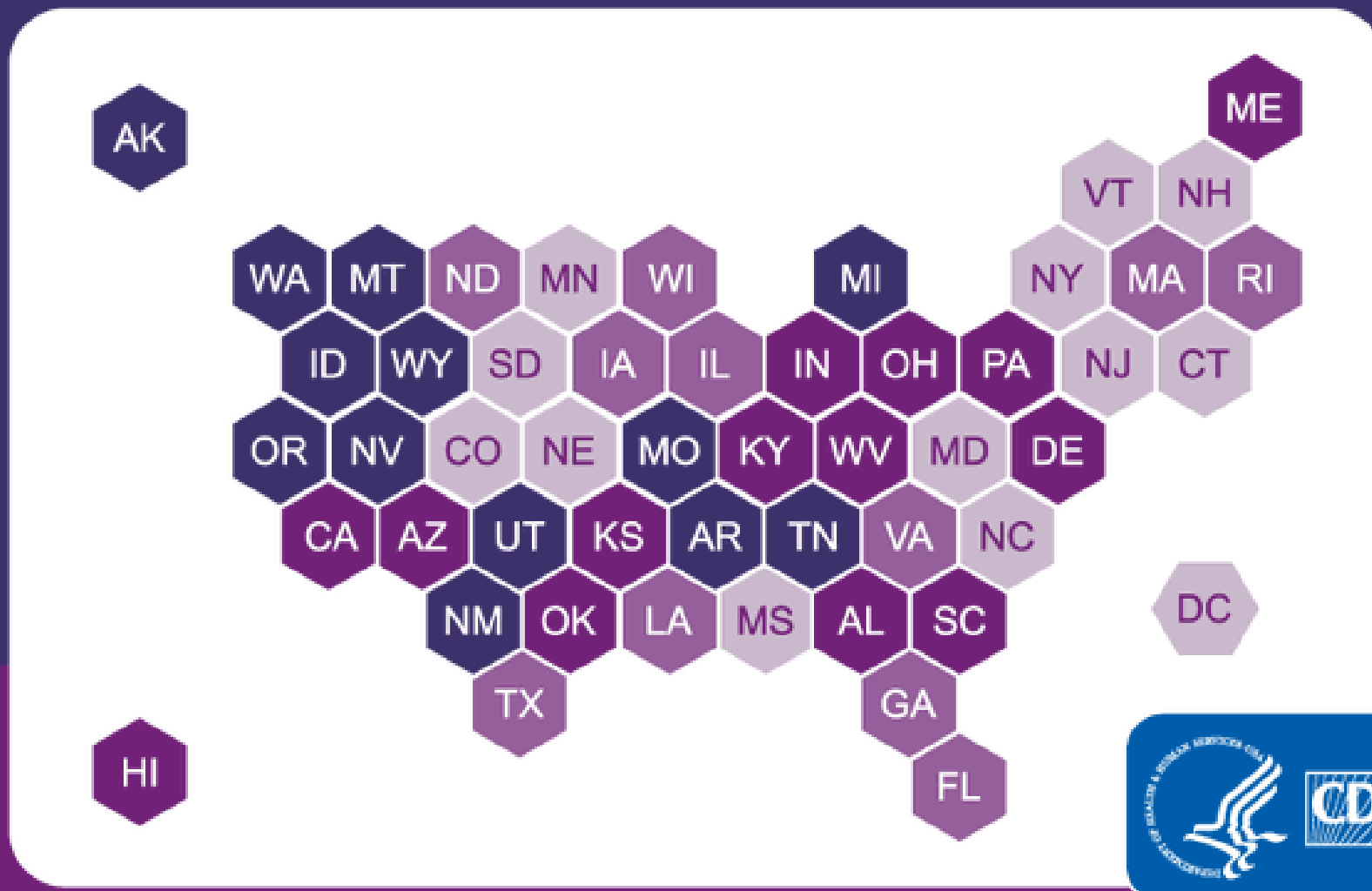
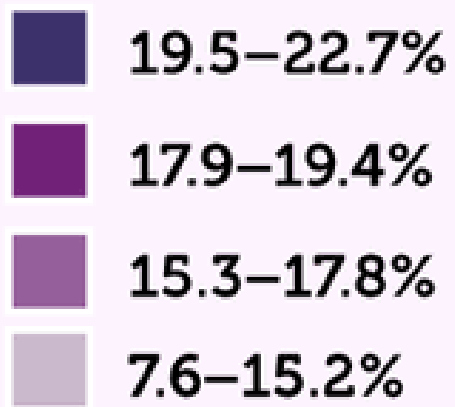
According to data collected from **adults across all 50 states and the District of Columbia** between 2011 and 2020:



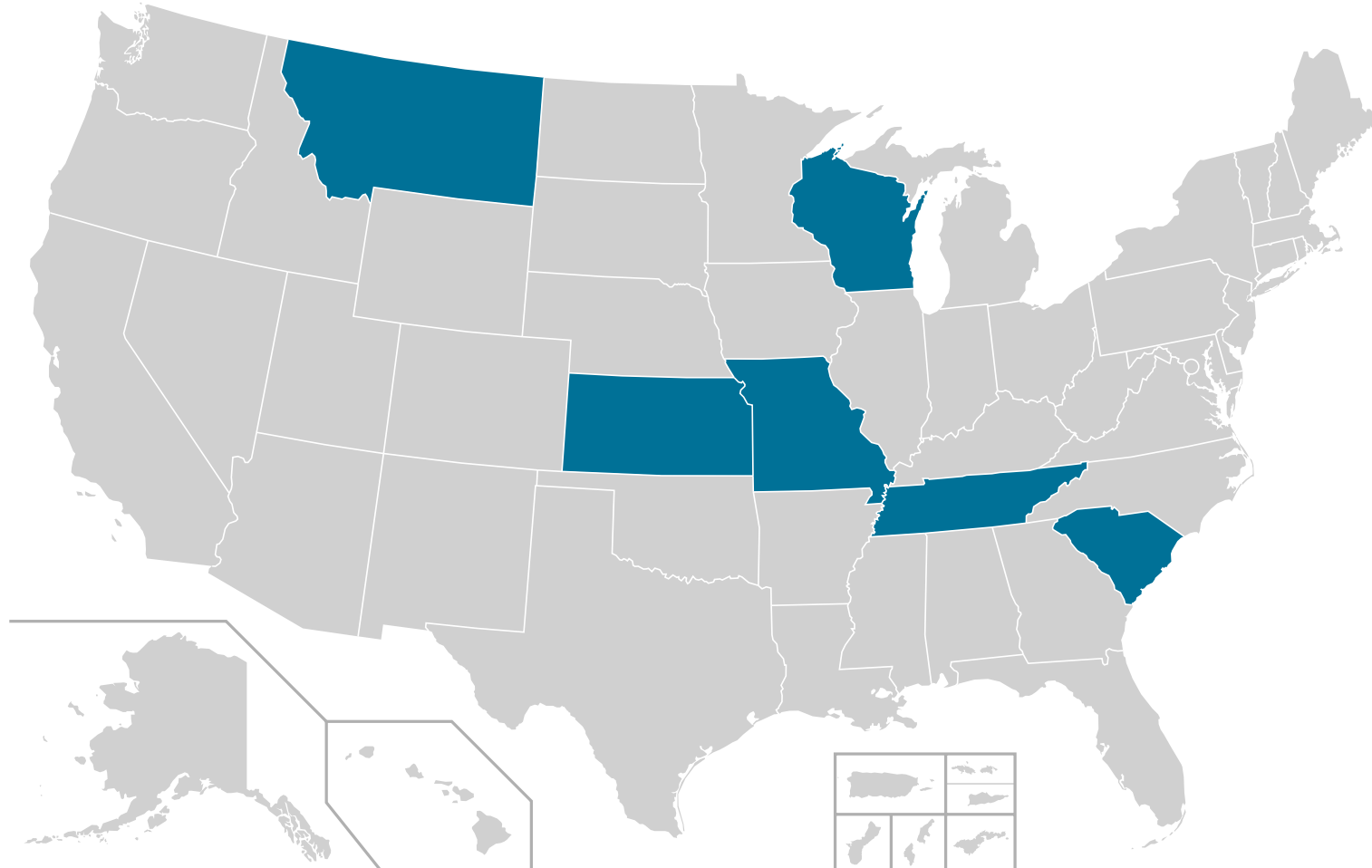
Source: Swedo EA, Aslam MV, Dahlberg LL, et al. Prevalence of Adverse Childhood Experiences Among U.S. Adults — Behavioral Risk Factor Surveillance System, 2011–2020. MMWR Morb Mortal Wkly Rep 2023;72:707–715. DOI: <http://dx.doi.org/10.15585/mmwr.mm7226a2>.

Prevalence of **4+ ACEs** Among Adults in the U.S.

The more adverse childhood experiences (ACEs) a person has, the more at risk they are for negative health outcomes.



State-Added Positive Childhood Experiences Questions—2015–2022



ACEs & PCEs Variables Available

- Core ACEs
Optional PCEs
module starting in
2025

ACEs questions included on BRFSS (2009–present)

ABUSE



Physical



Emotional



Sexual

NEGLECT *



Physical



Emotional

HOUSEHOLD CHALLENGES



Mental Illness



Divorce



Parent Treated Violently



Incarcerated Relative



Substance Misuse

Covariates

- Demographics
- Risk behaviors
- Outcomes

BENEFITS

Annual

Data for all 50 states and DC at least once since 2009

Wide range of health topics

Exposure precedes outcome

CHALLENGES

Recall, social desirability bias

Space on survey

\$\$\$\$

Non-response

Outcomes/covariables depends on other optional modules

Syndromic Surveillance (SyS)

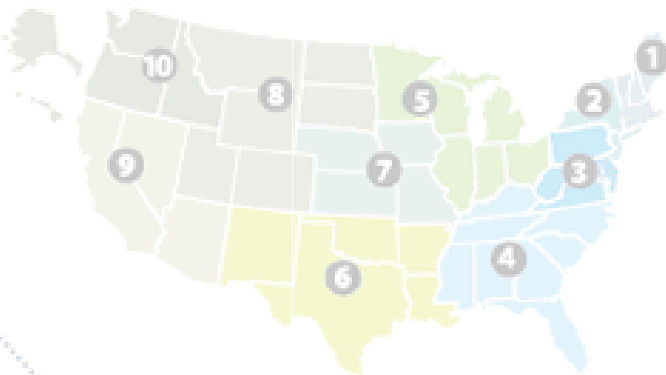




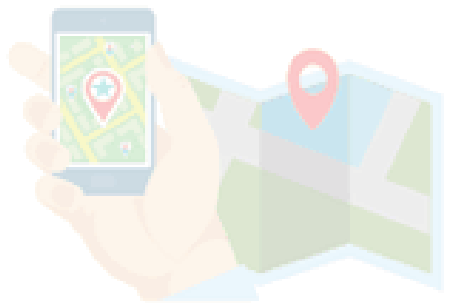




Emergency Department, Urgent Care, Ambulatory Care



National/10-Region Syndromic (Summary-level) Picture



State/Local Syndromic (Detail-level) Picture



Patient

Healthcare Service



Hospital

Syndromic Surveillance Clinical Data

Local System or BioSense Platform*

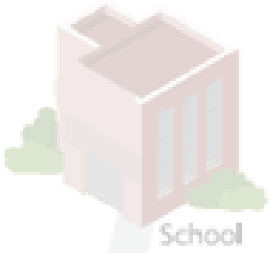
Syndromic Surveillance Practitioners



Pharmacy



Laboratory



School

Contextual Data



Poison Control



Large Events



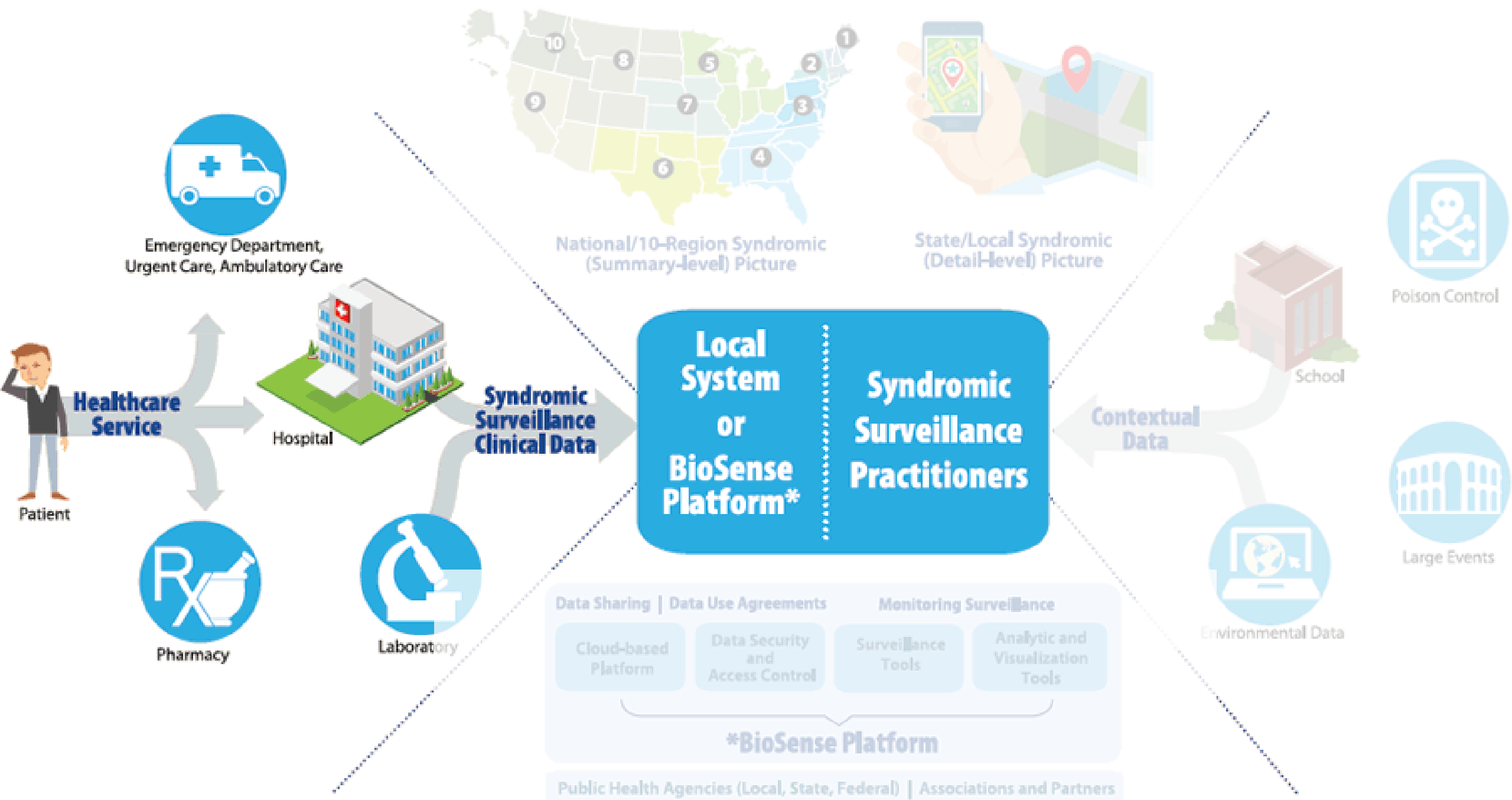
Environmental Data

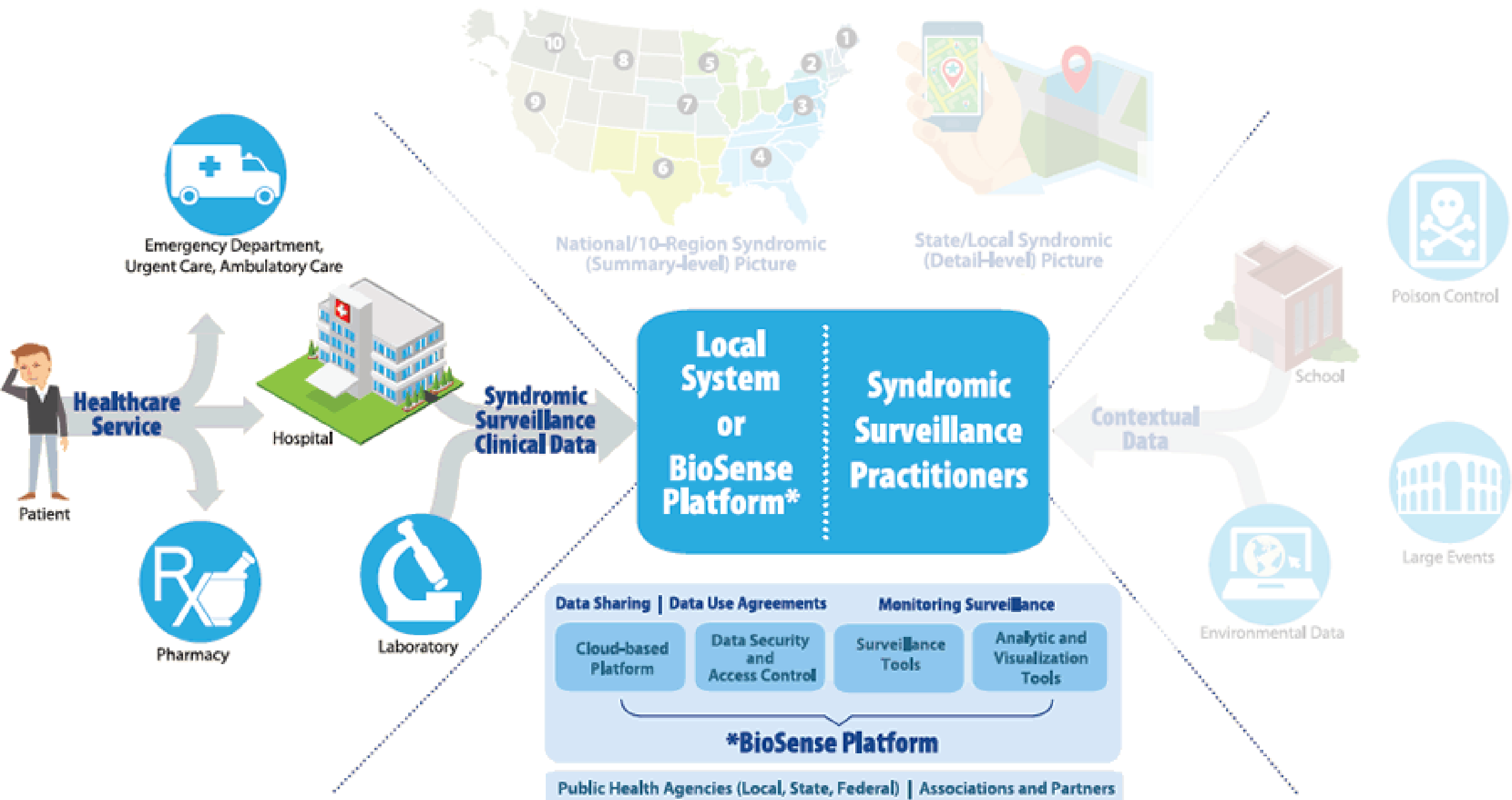
Data Sharing | Data Use Agreements | Monitoring Surveillance

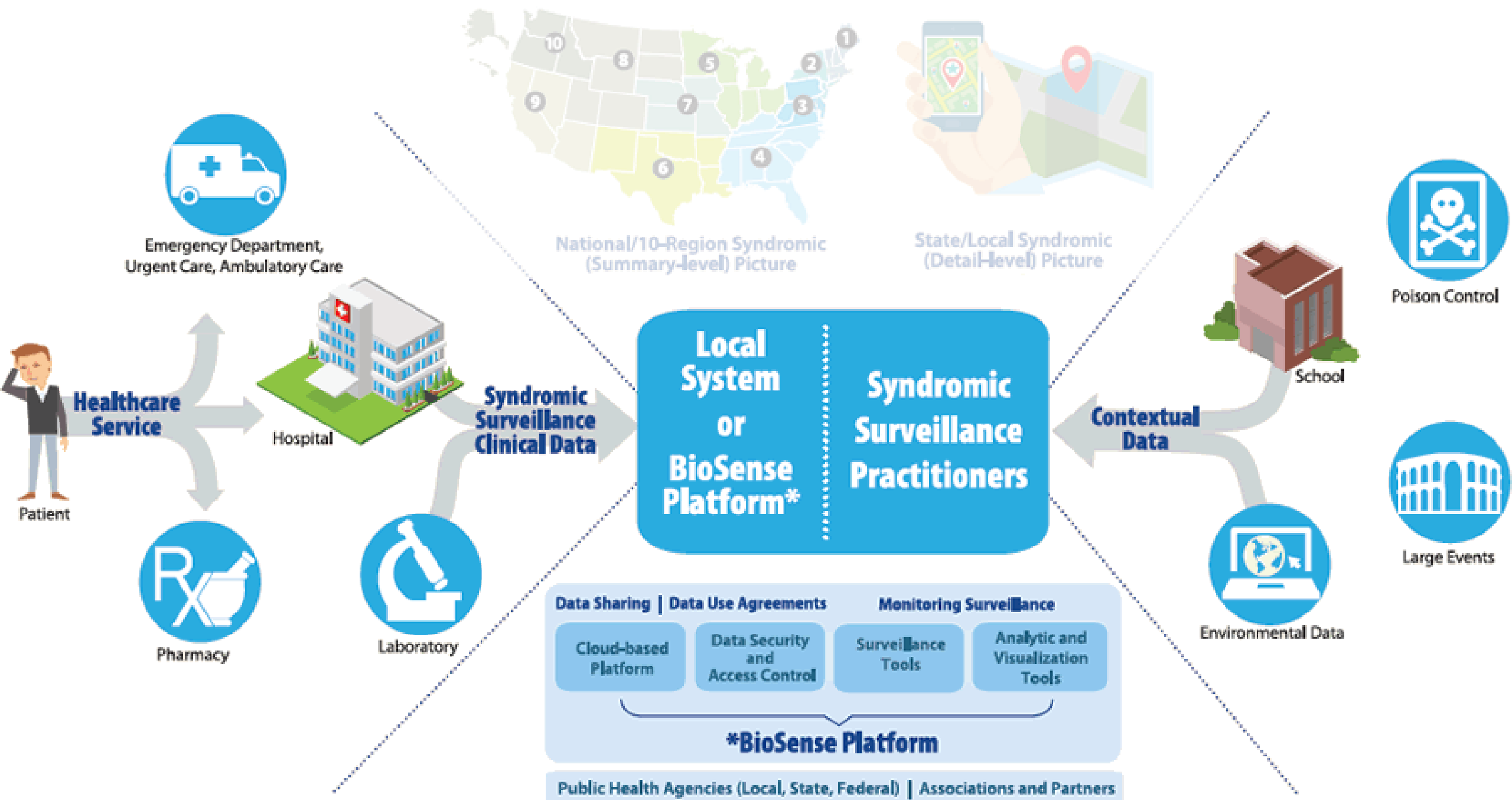
- Cloud-based Platform
- Data Security and Access Control
- Surveillance Tools
- Analytic and Visualization Tools

***BioSense Platform**

Public Health Agencies (Local, State, Federal) | Associations and Partners









NSSP Biosense Platform

BY THE NUMBERS



More than 6,500 health care facilities covering 50 states, the District of Columbia, and Guam contribute data to NSSSP daily.



Within 24 hours of a patient's ED visit, data are available to NSSP for analysis.

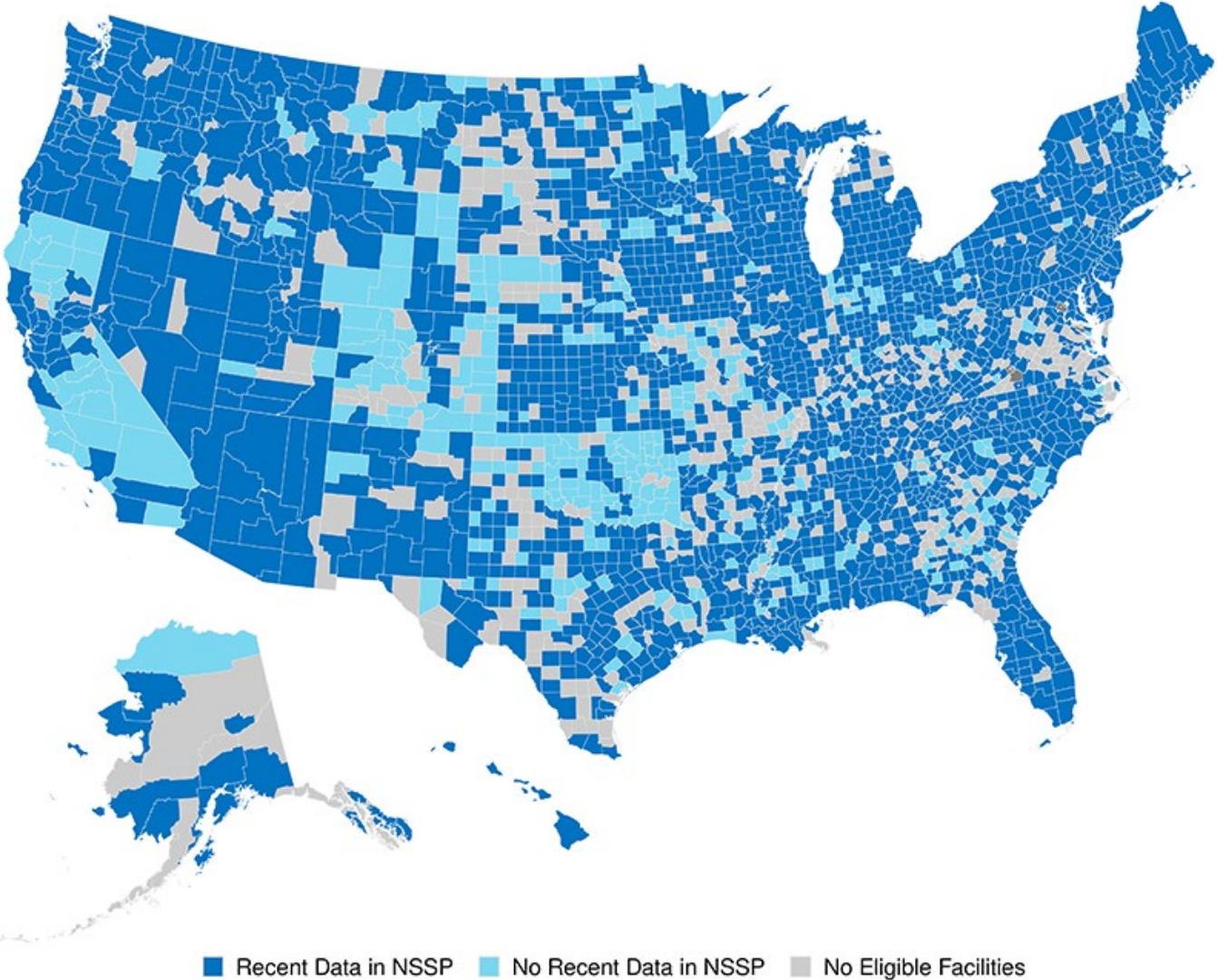


78% of U.S. emergency departments send data to NSSP.



More than 8 million electronic health messages are received by NSSP every day.

Non-federal Emergency Care Participation in the National Syndromic Surveillance Program:
January 1, 2023, to April 1, 2024.



Coverage in 2024:
50 States, DC, Guam

Geography

- Local
- State
- National-ish

ACEs & PCEs Variables Available

- Core ACEs
- Expanded ACEs
- No PCEs

The three types of ACEs include

Can be assessed in population of interest

Direct Childhood Experiences

Children under age 18 years

ABUSE



Physical



Emotional



Sexual

NEGLECT



Physical



Emotional

HOUSEHOLD CHALLENGES



Mental illness



Parent treated violently



Parental separation or divorce



Incarcerated relative



Substance use

+ OTHER ACES



Teen Intimate Partner Violence



Bullying/Peer Violence

The three types of ACEs include

ABUSE



Physical



Emotional



Sexual

NEGLECT



Physical



Emotional

HOUSEHOLD CHALLENGES



Mental illness



Incarcerated relative



Parent treated violently



Substance use



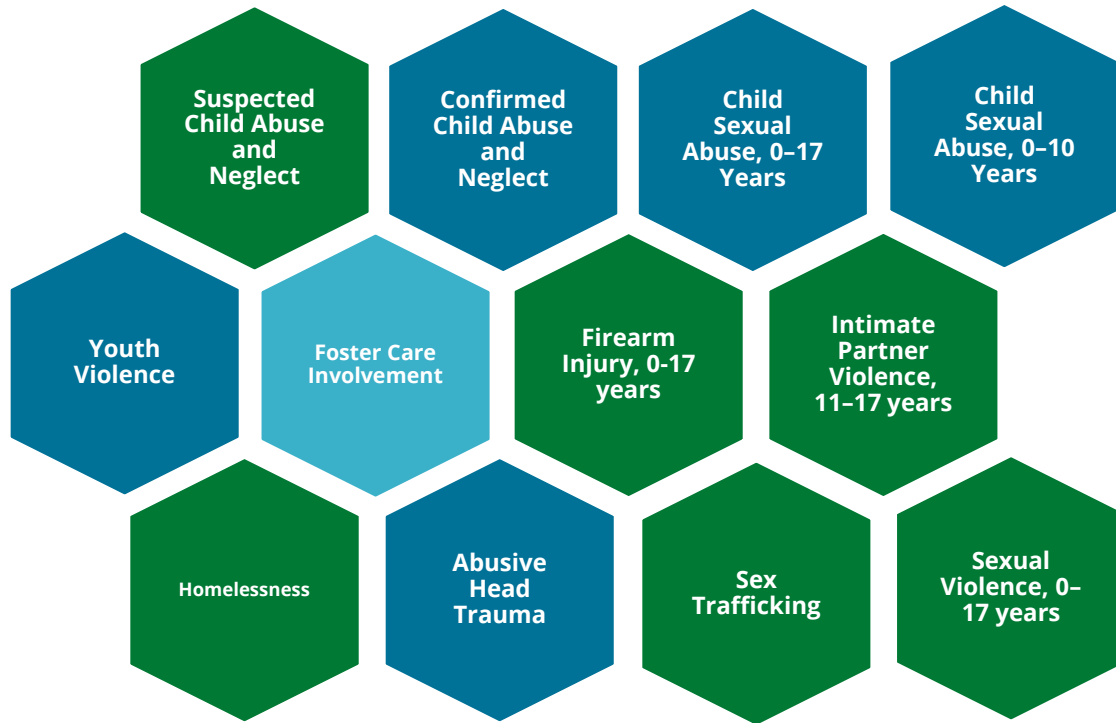
Parental separation
or divorce

Can only be assessed indirectly to gauge general household burden

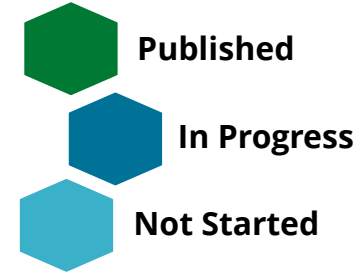
Household and Community Challenges among Adults (HCAs)

Adults Aged 18+ years

ACEs SYNDROME DEFINITIONS



Direct Childhood Experiences (Children 0-17 Years)



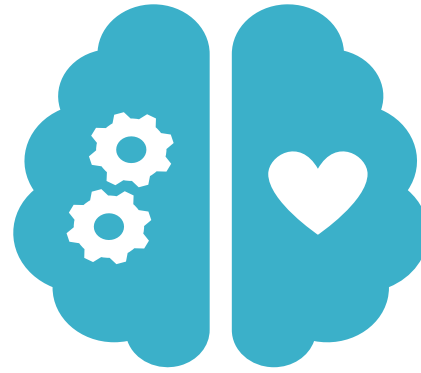
Household and Community Challenges (Adults >18 Years)

Covariates

- Demographics
- Comorbidities
- “Outcomes”

OUTCOMES

In addition to DIRECT CHILDHOOD EXPERIENCES and HOUSEHOLD CHALLENGES, syndromic surveillance can be used to monitor potential OUTCOMES of ACEs among children 0–17 years.



**Mental Health
Conditions**



**Suicide-Related
Visits**



**Substance Use
Problems**

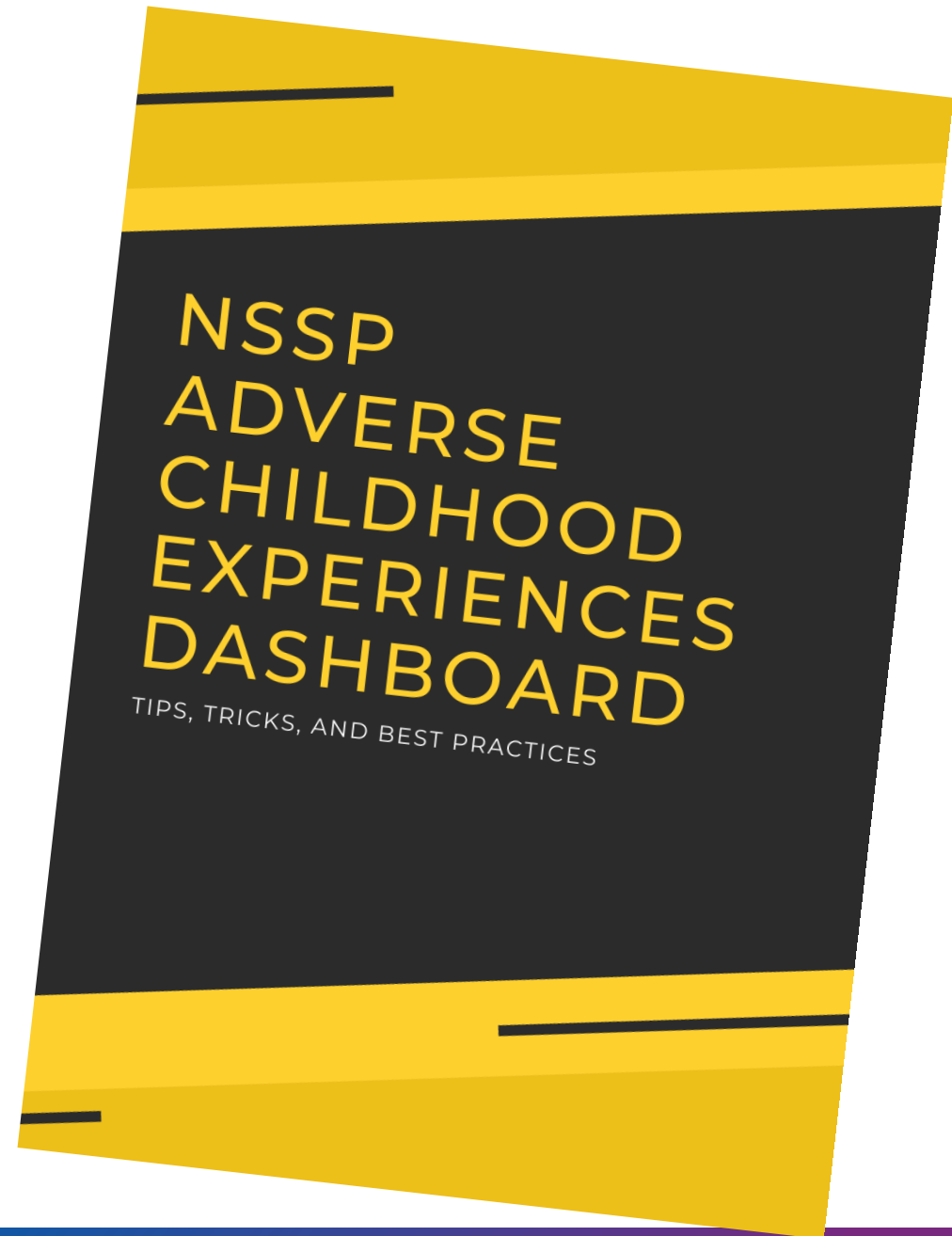
BENEFITS

- Timeliness of data
- Geographic coverage
- ED syndromic surveillance data can:
 - Alert states and communities to changes in violence outcomes
 - Facilitate a more rapid and coordinated response
 - Evaluate public health policies or programs

CHALLENGES

- Limited to ACEs that present to emergency departments
- Household challenge ACEs can only be measured by proxy
- Dependent on coding/recognition by provider
- “Outcomes” of ACEs are indirect

Check out the accompanying document in the Knowledge Repository for more tips, tricks, and best practices!



National Survey of Children's Health (NSCH)

- Geography
 - Census tract (restricted), state, national
- ACEs/PCEs Indicators Available
 - Core & expanded ACEs/PCEs
 - No abuse-related ACEs
- Covariates Available
 - Demographics, health outcomes, neighborhood characteristics
- Benefits
 - Rich contextual information, health outcomes, annual collection, can be linked to census in restricted dataset
- Challenges
 - Parent-reported data, no abuse-related ACEs, only indirect violence measurement

Pregnancy Risk Assessment and Monitoring System (PRAMS)

- Geography
 - Local, state
- ACEs/PCEs Indicators Available
 - Core & expanded ACEs
 - Select PCEs
- Covariates Available
 - Risk behaviors during and after pregnancy, pregnancy and infant health outcomes
- Benefits
 - Assess associations between childhood adversity and pregnancy and infant-related outcomes, intergenerational “transmission”
- Challenges
 - Cross-sectional, limited to people who have recently had a live birth, limited uptake by states

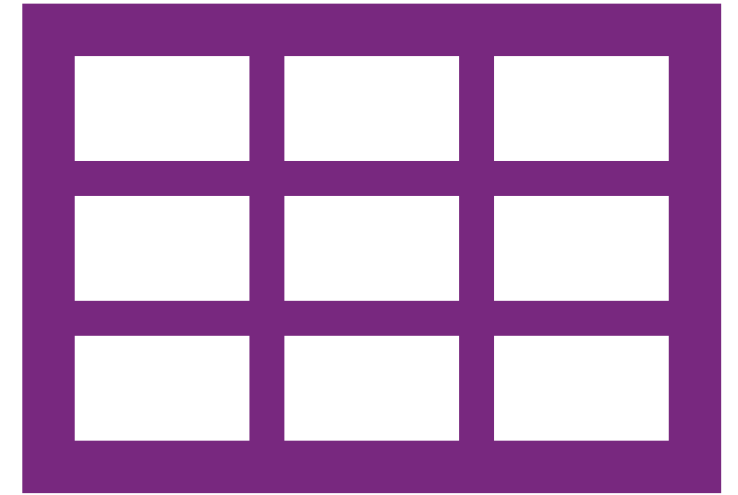
Other Data Sources



WEB PANEL



HOTLINE



ADMINISTRATIVE



Contact

Elizabeth Swedo
eswedo@cdc.gov

Appendix

- + [YRBS ACEs/PCEs Questions and analytic guidance](#)
- + [BRFSS ACEs Questions](#)
- + [Syndromic Surveillance ACEs Definitions and Dashboard Guidance](#)
- + [NSCH ACEs Questions](#)
- + [PRAMS Maternal Childhood Experiences Questions](#)