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2023 VIRTUAL RESEARCH SYMPOSIUM

**Showcasing Progress: Data and Evidence
for Better Government**



Evidence in Action: Using Data to Support Educator Decision-Making

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NASA Office of STEM Engagement (OSTEM)

K-12 Student Outcome Assessment

*Evidence in Action: Using Data to
Support Educator Decision-Making*

NASA STEM



AGENDA

- I. INTRODUCTION
- II. METHODOLOGY
- III. PARTICIPATING ACTIVITIES
- IV. PRELIMINARY OBSERVATIONS
- V. DISCUSSION





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SECTION I: INTRODUCTION





COMPREHENSIVE PERFORMANCE ASSESSMENT AND EVALUATION STRATEGY

Strategy Performance Framework

- Broad strategic goals designed to advance NASA’s mission and address relevant national problems, needs, challenges and opportunities.
- Timeframe: **2022 – 2026**

Performance Assessment

- Ongoing monitoring and reporting of program accomplishments, particularly progress toward pre-established goals.
- Includes outputs such as: higher education interns and fellows demographics and number of paper presentations and peer-reviewed publications; and outcomes such as developing higher education students’ science or engineering identity.
- Timeframe: **Short term (Annual)**

Evaluation

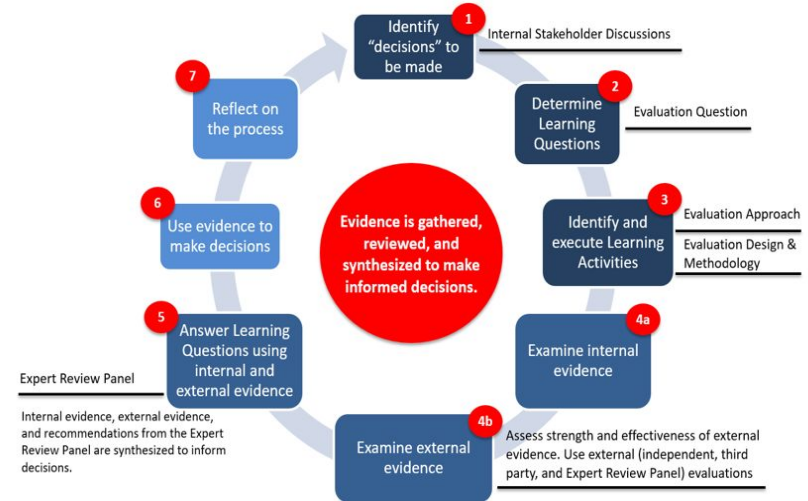
- Systematic study using research methods to collect and analyze data to assess how well a program is working and why.
- Includes outcomes such as: developing higher education students’ science or engineering identity, cognitive understanding of research processes and skills, or longitudinal study of interns.
- Timeframe: **Long term**





LEARNING AGENDA FOCUS AREA AND APPROACH

FOCUS AREAS	LEARNING AGENDA QUESTIONS
CONTRIBUTIONS TO NASA'S MISSIONS & WORK	Learning Agenda Question 1: To what extent are NASA's STEM engagement investments contributing to NASA's missions and work?
DIVERSITY OF THE FUTURE STEM WORKFORCE	Learning Agenda Question 2: How do NASA Internships broaden participation of historically underrepresented and underserved students to advance equity and build a diverse future workforce?
PERFORMANCE ASSESSMENT & EVALUATION	Learning Agenda Question 3: To what extent have enhancements to STEM engagement performance assessment and evaluation been implemented?
UNDERSTANDING K-12 STEM ENGAGEMENT INVESTMENTS	Learning Agenda Question 4: What are effective strategies to support and measure NASA STEM Engagement K-12 investments' ability to spark student interest in STEM?





How does NASA Office of STEM Engagement (OSTEM) define:

1. Clear goals and desired outcomes of NASA STEM Engagement K-12 activities
2. NASA STEM Engagement K-12 Logic Model or Theory of Change
3. An explanation of NASA's expertise and comparative advantage in the K-12 education space (or how NASA plans to work with partners that have this expertise)
4. An evaluation strategy to test assumptions built into the logic model or theory of change





FY 2021

NASA STEM Engagement K-12 Comprehensive Evaluation Study

- Identified current state of NASA K-12 activities
- Proposed common vision, goals, and objectives for K-12 activities
- Offered logic model and theory of change to illustrate the mechanisms of program efforts
- Piloted validated tools for assessing student outcomes

3-Step Strategic Design and Portfolio Alignment Process

Step 1

Step 2

Step 3

Conduct a K-12 Portfolio Evaluation

1. Establish a process for conducting an independent portfolio evaluation to assess the alignment of K-12 activities to STEM Engagement vision, goals, objectives (i.e., mission alignment, diversity)
2. Review how the products, opportunities, and partnerships are effectively meeting the overarching STEM Engagement goals and objectives

Develop a Theory of Change & Logic Model

1. NASA STEM Engagement Strategy & Portfolio Alignment
2. CoSTEM Alignment
3. Convene an Expert Review Panel to make recommendations

Establish Performance Measures & Evaluation Strategy

1. Specific, measurable objectives
2. Performance measures & targets
3. Inventory of relevant outcome assessments



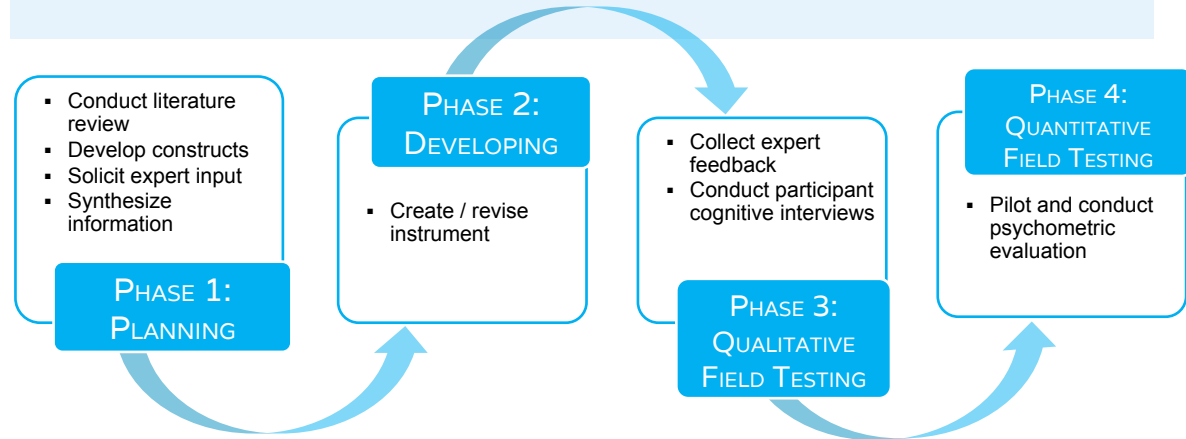


FY 2022

NASA STEM Engagement K-12 Student Outcome Assessment and Instrument Development

- Created and validated a set of STEM student outcome surveys
- Student self-reported outcomes:
 - 1) STEM Identity
 - 2) STEM Self-Efficacy
 - 3) STEM interest
 - 4) 21st Century Skills
- Three grade band levels:
 - 1) Elementary (4-5)
 - 2) Middle (6-8)
 - 3) High School (9-12)

DESIGN-BASED RESEARCH SURVEY DEVELOPMENT PROCESS





FY 2021

NASA STEM Engagement K-12 Comprehensive Evaluation Study

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 - 3) High School (9-12)

FY 2023

K-12 Student Outcome Assessment Study

- Outcome and demographic information in range of NASA K-12 student engagements
- Additional information about:
 - 1) Student outcome and demographic data for NASA K-12 outreach program participants
 - 2) Usefulness of nominal additional survey items
 - 3) Utility of data to inform programmatic improvement





STUDY DESIGN

Utilization-Focused Evaluation

- Focused on utility – the actual use and application of evaluation findings
- Planned to create positive evaluation experience for participants so that the experience helps “real people in the real world apply evaluation findings” (Patton, 2015, p. 156)

Stakeholder Engagement

1. Meetings with NASA Engagement Managers
2. Program-level short evaluation memos
3. Discussions with Engagement Managers to receive feedback



SECTION II: METHODOLOGY





EVALUATION QUESTIONS



EVALUATION QUESTION 1:
To what extent do students who participate in NASA K-12 STEM Engagement programs report positive STEM identity, self-efficacy, interest, sense of belonging, and 21st century skills?



EVALUATION QUESTION 2: What are the psychometric properties of additional questions added to student STEM outcome surveys?



EVALUATION QUESTION 3:
In what ways does outcome assessment of K-12 STEM engagement provide useful information to NASA Engagement Managers to inform program improvement?





Evaluation Question	Data Source	Data Analysis
EQ1. To what extent do students who participate in NASA K-12 STEM Engagement programs report positive STEM identities, self-efficacy, interest, sense of belonging, and 21st century skills?	STEM student outcome surveys	Quantitative and Qualitative Analysis Document Analysis
EQ2. What are the psychometric properties of additional questions added to the surveys to measure student STEM outcomes?	STEM student outcome surveys	Cognitive Interviews Psychometric Analysis
EQ3. In what ways does outcome assessment of K-12 NASA STEM Engagement provide useful information to Engagement Managers to inform program improvement?	Conversations with NASA Engagement Managers	Qualitative Analysis





Student survey

Elementary (grades 4-5), Middle (grades 6-8),
High school (grades 9-12)

*Student
self-reported STEM
identity, interests,
self-efficacy, 21st
century skills, and
sense of belonging*

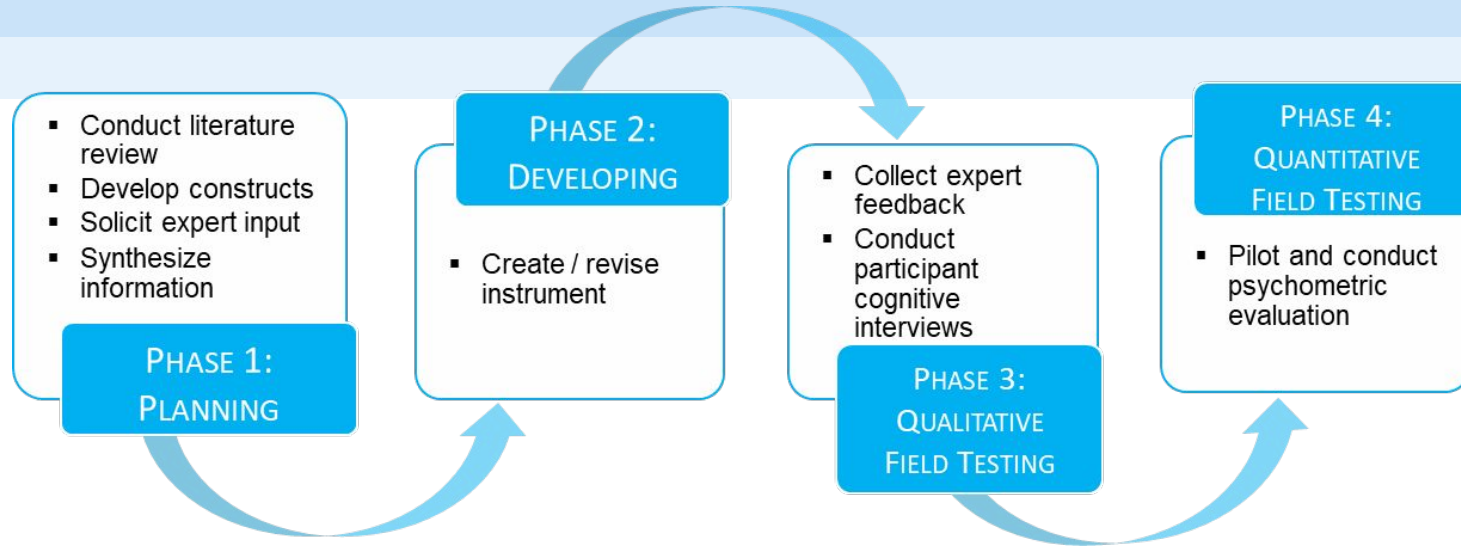
High school students only – set of demographic
questions

26 items within five constructs





DESIGN-BASED RESEARCH SURVEY DEVELOPMENT PROCESS – PREVIOUS CONTRACT



Survey Construct	Definition	Items
STEM Identity	An individual's perception of themselves as a STEM person. STEM identity has been linked to persistence in STEM fields and STEM career choice, particularly for amongst students underrepresented in STEM.	Six-items: e.g., "My parent or guardians think I am good at STEM."
STEM Self-Efficacy	A person's confidence in their ability to do STEM, which is related to an individual's motivation to learn, likelihood to choose a STEM major in college, and decision to choose a STEM career path.	Five-items: e.g., "I am confident about trying out new STEM ideas."
STEM Interest	A person's overall interest in STEM discipline(s), which supports motivation to learn about STEM, predicts the likelihood of pursuing STEM careers, and often serves as a precursor to engagement.	Seven-items: e.g., "I like learning about STEM."
21st Century Skills	Skills essential for success in STEM learning and careers, including knowledge construction, real-world problem solving, skilled communication, collaboration, use of technology for learning, and self-regulation.	Seven-items: e.g., "I can come up with new STEM ideas."
Sense of Belonging	A person's feelings of being connected to and a part of a specific community. Sense of belonging has been connected to formal and informal STEM engagement, particularly amongst students underrepresented in STEM.	One trial item: "I feel like I fit in within the NASA program."

References: Blotnicky et al., 2018; Carlone & Johnson, 2007; Chemers et al., 2011; Dabney et al., 2012; Dou et al., 2019; Falk et al., 2015; Grimalt-Álvarez et al., 2022; Hazari et al., 2013; Herrera & Kovats Sánchez, 2022; Luo et al., 2021; Mulvey et al., 2022; Paul et al., 2020; Perez et al., 2013; Stehle & Peters-Burton, 2019; Tseng et al., 2013; Wang, 2013.



DATA COLLECTION AND ANALYSIS – EQ2

STEM Student Outcome Survey

Evaluation Question 2

*Psychometric
Analysis of
Added Items*

Rasch measurement for overall fit and scale functioning

Correlational analysis about relationships between survey items

Cognitive interviews to assess wording and construct validity of new items (if possible)

Factor analysis to test constructs (if possible)





DATA COLLECTION AND ANALYSIS – EQ3

Document Review and Engagement Manager Discussions

Evaluation Question 3

Engagement Manager Feedback

Internal Evaluation Memos

Informal discussions with Engagement Managers

Content analysis of Engagement Manager discussions



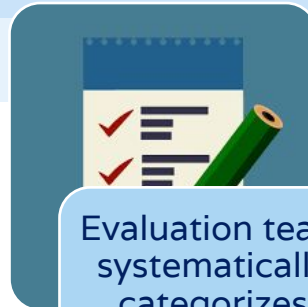


DATA COLLECTION AND ANALYSIS – DOCUMENT REVIEW

Document Review



Following initial meetings, team requests relevant STEM engagement activity documents as needed

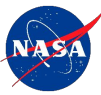


Evaluation team systematically categorizes STEM engagement activity components



Extant data provides context to understand student outcomes and Engagement Manager evaluation needs





DATA COLLECTION AND ANALYSIS – DOCUMENT REVIEW

Document Review

- Grade Level
- Setting: *formal, informal, after-school*
- Program goals / mission statement
- Reach: student number
- Student contact hours
- Students: *populations/communities*
- Program type: *camp, competition, etc.*



INTERNAL DATA MEMO – NOTIONAL TEMPLATE

NASA K-12 STUDENT OUTCOME ASSESSMENT EVALUATION MEMO

The NASA K-12 Student Outcome Assessment is a study designed to assess student outcomes across NASA K-12 STEM engagement opportunities using a survey that has been validated by the NASA Office of STEM Engagement Performance & Evaluation Functional Area. Students in [NAME OF PROGRAM] responded to the online survey in [SPRING/SUMMER] 2023 about STEM identity, 21st century skills, STEM self-efficacy, STEM interest, and sense of belonging in STEM. This evaluation memo summarizes the outcomes of that survey for the students in your STEM engagement investment.

Student Outcomes - [NAME OF PROGRAM]

[NAME OF PROGRAM] offers [PROGRAM DESCRIPTION] of [#STUDENT RESPONSES] students connected to positive outcomes and underrepresented in STEM.

Student STEM Outcomes	Example Question	Program Outcomes	Sample Outcomes
21st century skills	Skills essential for success in STEM learning and careers, including knowledge construction, real-world problem solving, skilled communication, collaboration, use of technology for learning, and self-regulation.	7 items: "I can come up with new STEM ideas."	[MEAN RATING]* or [% STUDENT AGREEE] or other option for reporting outcomes
STEM interest	A person's overall interest in STEM discipline(s), which supports motivation to learn about STEM, predicts the likelihood of pursuing STEM careers, and often serves as a precursor to engagement.	7 items: "I like learning about STEM."	
STEM identity	An individual's perception of themselves as a STEM person. STEM identity has been linked to	6 items: "My parents or guardians think I am	
Self-efficacy			
Sense of belonging			

Potential other information to share with programs - NOTIONAL

- The highest rated scale among students in your program was [NAME OF SCALE]. This suggests [INTERPRETATION TEXT]
- The lowest rated scale among students in your program was [NAME OF SCALE]. This suggests [INTERPRETATION TEXT]
- There [WERE/WERE NOT] differences by student demographic characteristics. This suggests [INTERPRETATION TEXT]

SECTION III: PARTICIPATING ACTIVITIES





STUDY DESIGN: PROGRAM IDENTIFICATION

1. Program has participants in grades 4-12
2. Timing of program implementation
3. Agreement to participate
4. Program type
5. Grade-level of students





- Provide study overview
- Clarify study goals
- Discuss fit: program timing, site locations, method of survey delivery
- Address consent procedure questions
- Discuss survey options

$N = 16$

INITIAL FIT
CONVERSATION

1

- Answer remaining questions
- Finalize data collection timeline / plan
- Provide individual survey links for English and/or Spanish language surveys
- Collect program documents

$n = 6$

INTERVIEW /
DOCUMENT
REVIEW

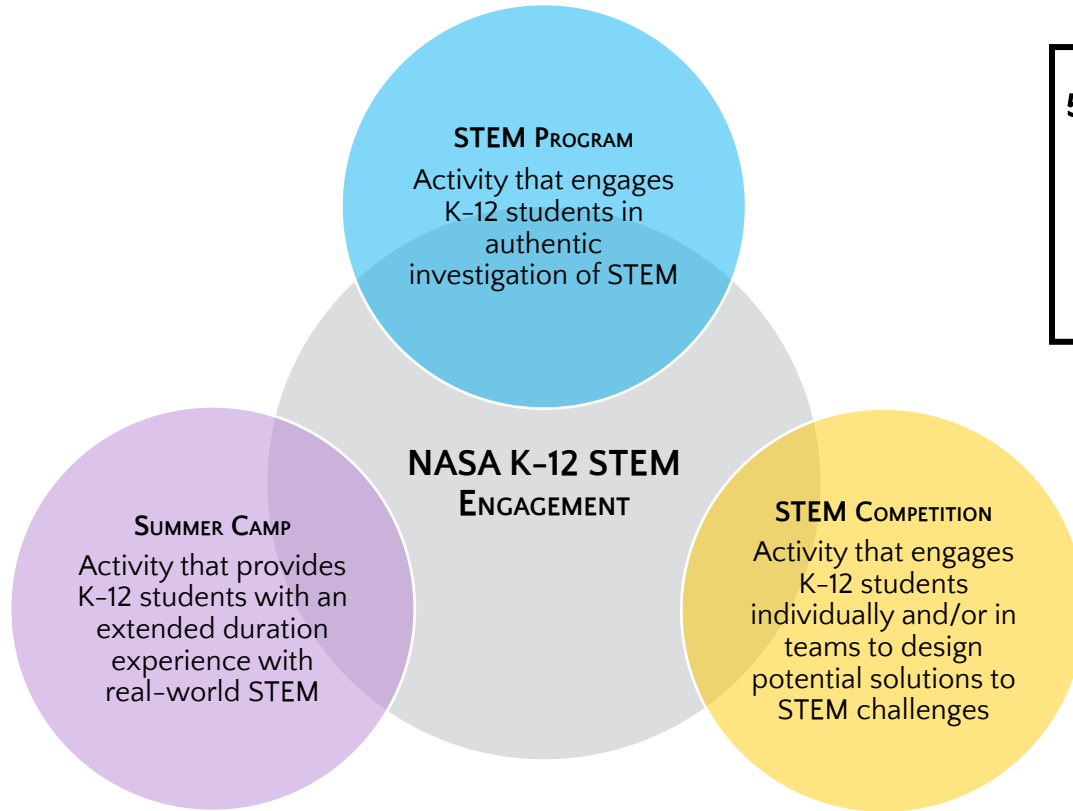
2

- Engagement Manager disseminates survey to students
- Evaluation team provides data collection updates on request
- Evaluation team begins evaluation memo preparation

DATA COLLECTION
ANALYSIS

3





519 survey responses:

- Elementary ($n=65$)
- Middle School ($n=73$)
- High School ($n=379$)



SECTION IV: PRELIMINARY OBSERVATIONS





Observations & Feedback

- Initial conversations and program-specific internal evaluation memos have been well-received
 - Initial conversations facilitate tailored data collection plan
 - Building relationships is important



Study Team's Responses to Observations & Feedback

- Created a study “one-pager” to introduce the evaluation
 - Prioritized translation of survey into Spanish
- Created separate links to allow for analysis by group characteristics (in-person versus virtual, by sites)
 - Included equity lens in document review process





IDEAS FOR FUTURE LEARNING ACTIVITIES

Create survey for
grades 1-3

Communicate
definition of
STEM

Communicate
definition of
STEM

Provide
instruments for
programs

Connect data to
other sources

Support and
connection
across groups
(learning
communities)

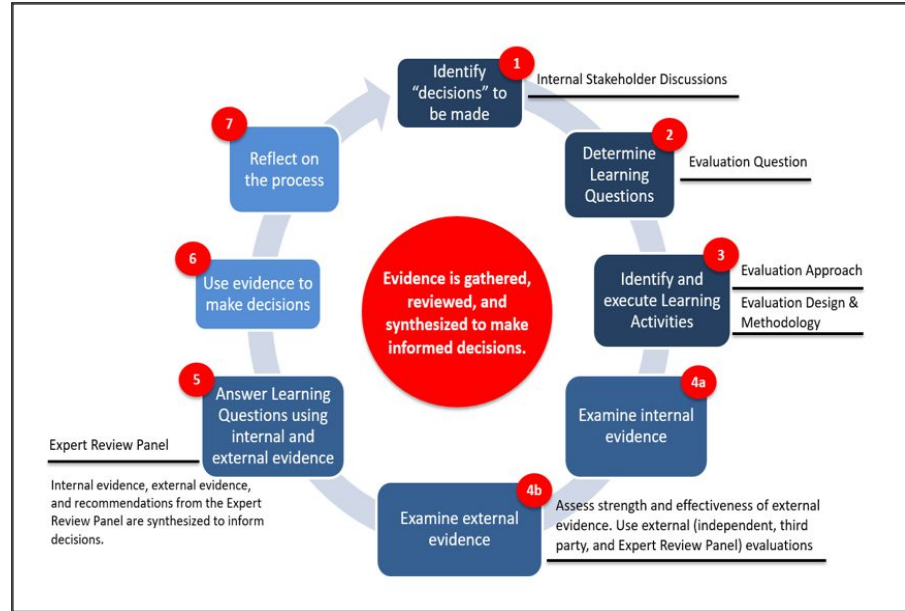
Apply this
process to other
evaluation efforts





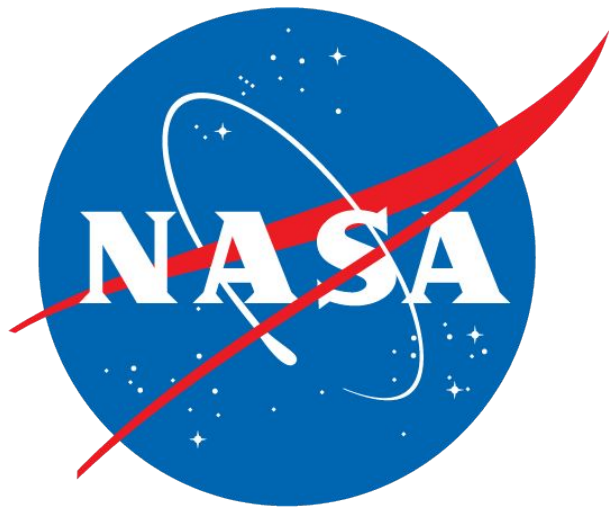
TAKEAWAYS

- *Building relationships* with Engagement Managers and the NASA community – facilitator of effective evaluation processes
Importance of relationship building
- *Responding to the needs* of NASA community and its beneficiaries – study participants – enable enhanced utilization of evidence
- *Balancing efficiency and utility*
- *Integrating best practices* across OSTEM evaluation efforts
- *Executing the Evidence-Based Decision-Making Process*



SECTION IV: DISCUSSION







Better Metrics to Guide Public Health Policy: Lessons Learned From COVID-19 for Public Health Data Systems Improvement

Michael Stoto, Ph.D.

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School of Health, Georgetown University



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Better Metrics to Guide Public Health Policy: Lessons Learned From COVID-19 for Public Health Data Systems Improvement

Michael A. Stoto, PhD
Data Foundation 2023
Research Symposium
May 24, 2023

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Better metrics to guide public health policy

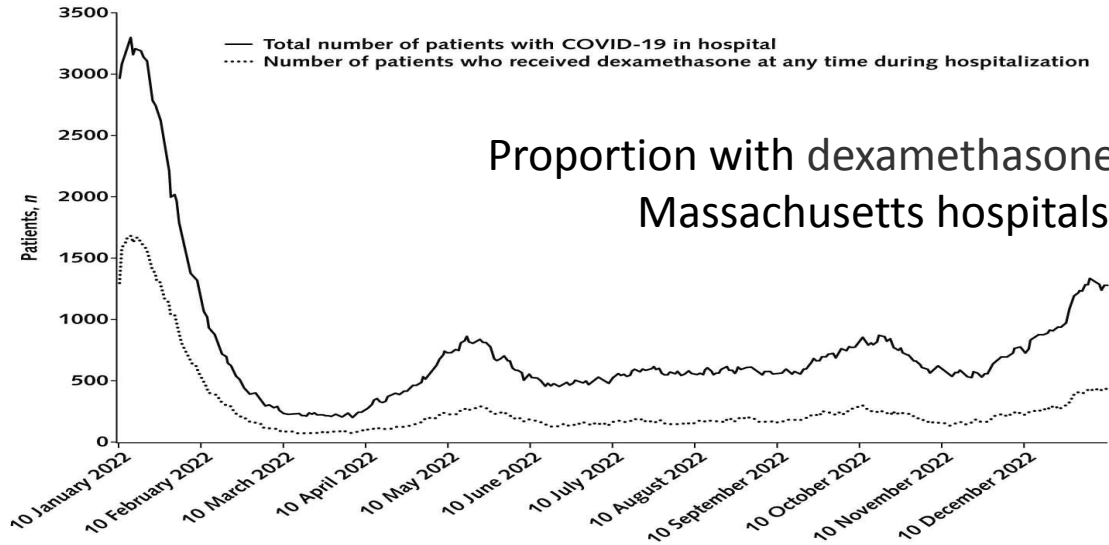
- As communities adjust policies to mitigate COVID-19, the focus is on objective "metrics" to guide decisions
 - mostly based on counts of cases, hospitalizations, deaths
 - "everyone knows that these are not complete, but ..."
- CDC Data Modernization Initiative
 - working with public health, hospitals, etc. to create modern, interoperable, and real-time data sharing systems
 - may be necessary, but not sufficient
- Consider entire public health "data infrastructure"
 - how to make the best of current data systems
 - strategies for improving data systems for future public health emergencies

Case-based surveillance

- Fundamental public health system
 - primary goal: identify cases and intervene to prevent transmission to others
 - secondary goals: epi investigations, surveillance reports
 - state authority, local implementation
 - Iceberg effect: # reported cases < # infected
 - individuals with mild symptoms or none at all
 - who is tested, which test, when, why, test availability
 - definitions, policies, reporting systems, etc.
 - patient & provider decisions to report
 - proportion of cases varies over time, between jurisdictions
 - iceberg "bobs"
 - ratio varies from < 4 to > 10
- Case counts are not as "objective" as they appear

Hospitalizations and deaths

- Hospitalizations "for" vs. "with Covid"



Proportion with dexamethasone declines from 50% to 33%
 Massachusetts hospitals, Doron *et al.*, 2023

- Covid deaths not reported as such

	Time period					
Midwest	85%	61%	93%	98%	60%	65%
Northeast	83%	101%	105%	127%	56%	83%
South	79%	67%	84%	62%	66%	61%
West	76%	57%	84%	67%	52%	62%
U.S.	82%	66%	89%	78%	61%	66%

Ratio of reported to
 estimated COVID-19 deaths,
 U.S. Jan. 2020 – April 2022
 Stoto *et al.*, 2022

Making the best of existing data systems

- Data & metrics are the output of a complex system
 - providers, test centers, labs, health departments generate case reports, death certificates, capacity measures, ...
 - data compiled, processed, analyzed, and published
 - by a network of local, state, and federal agencies
 - each with its own regulations, procedures, and interests
 - disseminated by these agencies & media, each of which does its own analyses and visualizations
 - Metrics used to compare
 - consistency more important than completeness
- 1. CDC must set standards for all of this, not just case definitions & data exchange***
- Model to consider: National Vital Statistics System

Making the best of existing data systems

- Public health emergencies are complex phenomenon
 - incidence levels vs. trends
 - risk of infection in different settings
 - health care system capacity
 - vaccine uptake
 - ...
- No single metric is sufficient
- 2. *CDC should develop a balanced portfolio of metrics***
 - together describe key aspects of epidemiologic situation
 - without overwhelming numbers of indicators or detail
- "Epidemic intelligence" approach
 - future emergencies will require different choices, but a portfolio can be a good starting point

Making the best of existing data systems

- Metrics intended to inform-not decide-policy choices
 - that balance health benefits and social & economic costs
 - taking into account the current state of the pandemic
- However, metrics are imperfect indicators of the epidemiologic situation
 - interpretation and utility changes as the pandemic ebbs and flows, data systems evolve & policy questions change

3. Focus on the decision, not the number

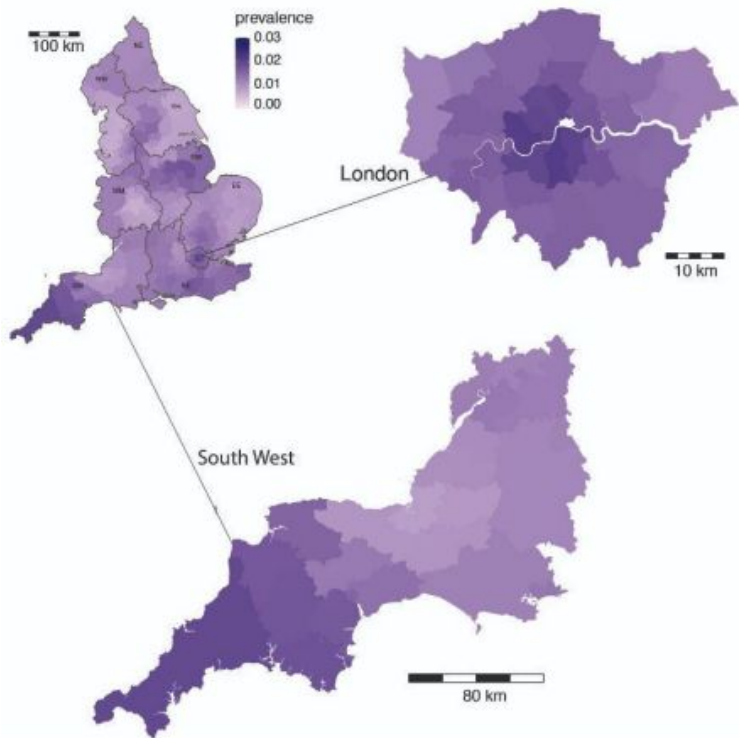
- avoid hard triggers
- consider the big picture over weeks and months, not daily numbers

Improving public health metrics: Implications for data system reform

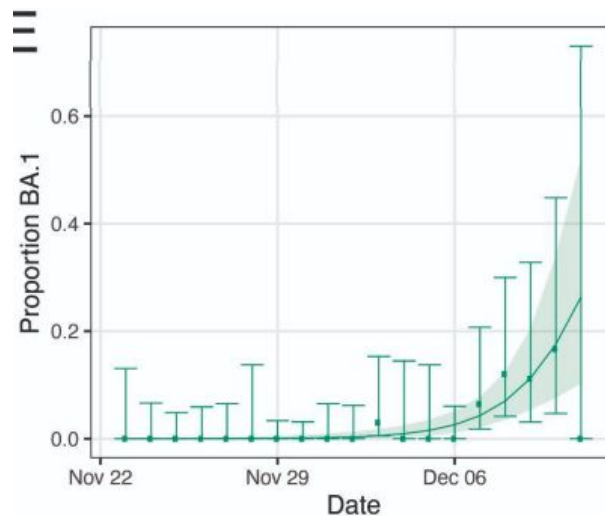
- Case counts will always be important, but we must supplement them with statistical estimates
- ‘Estimation’ sounds less precise than ‘counting,’ but
 - can provide a more comprehensive and accurate assessment of the pandemic’s impact on different populations as it changes over time
 - consistency more important than completeness
 - avoids the cost of counting every case
 - however, individual cases are not "actionable"
- Examples – each with strengths and weaknesses
 - population-based sampling: infection, public understanding, social and economic impact, etc.
 - excess mortality
 - syndromic surveillance
 - wastewater surveillance

Population based sampling: U.K. REal-time Assessment of Community Transmission (REACT) study

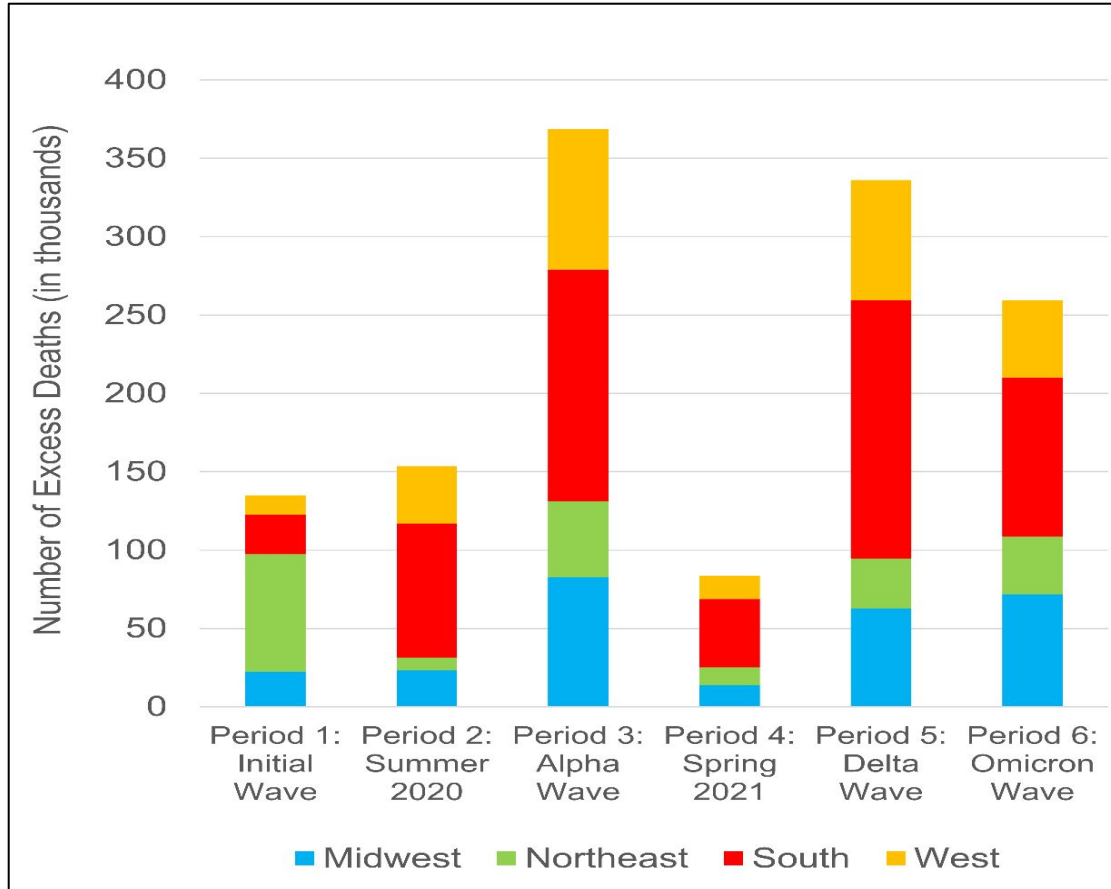
Prevalence of SARS-CoV-2 in round 16 (23 November - 14 December 2021)
in 297,728 participants with a valid RT-PCR test result



Proportion with Omicron variant



Excess mortality



US, Jan 2020–Apr 2022

Excess deaths by period

- Mostly in Alpha (27.6%) & Delta (25.2%) waves
- Almost half (49.2%) before March 2021 (when vaccines became available)

Excess deaths by region

Before June 2020

- 56% of deaths in the Northeast
- 17% of US population

Since June 2020

- 45% in the South
- 38% of US population

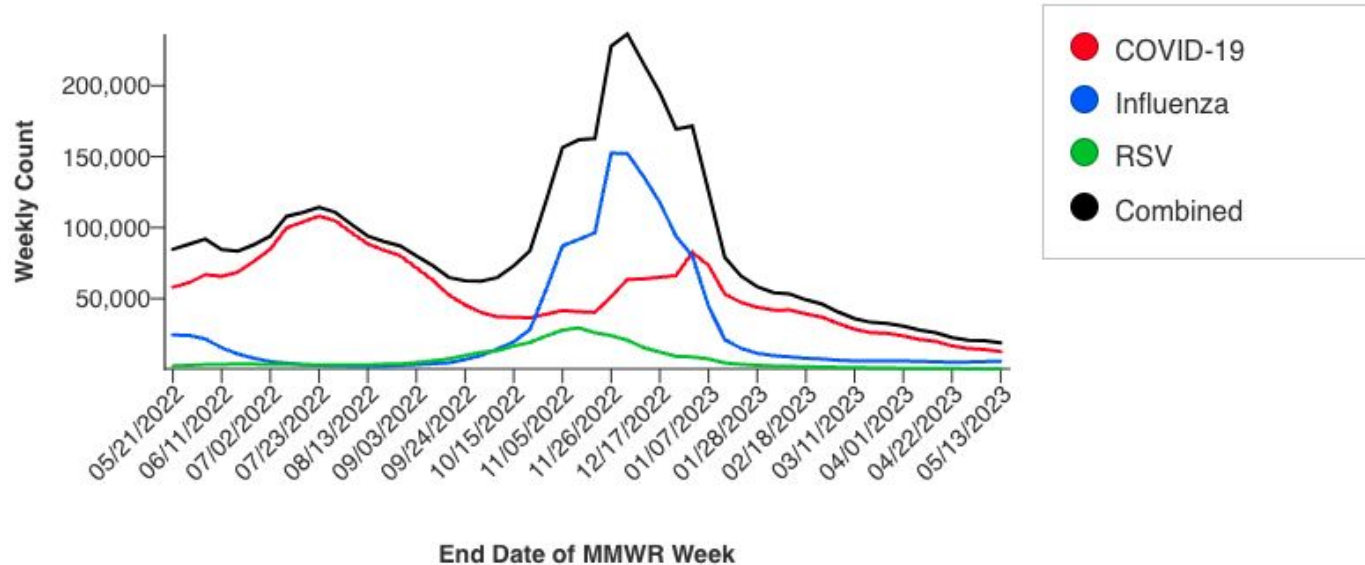
Syndromic surveillance

Weekly Emergency Department Visits by Age Group

Make a selection from the filters to change the visualization information.

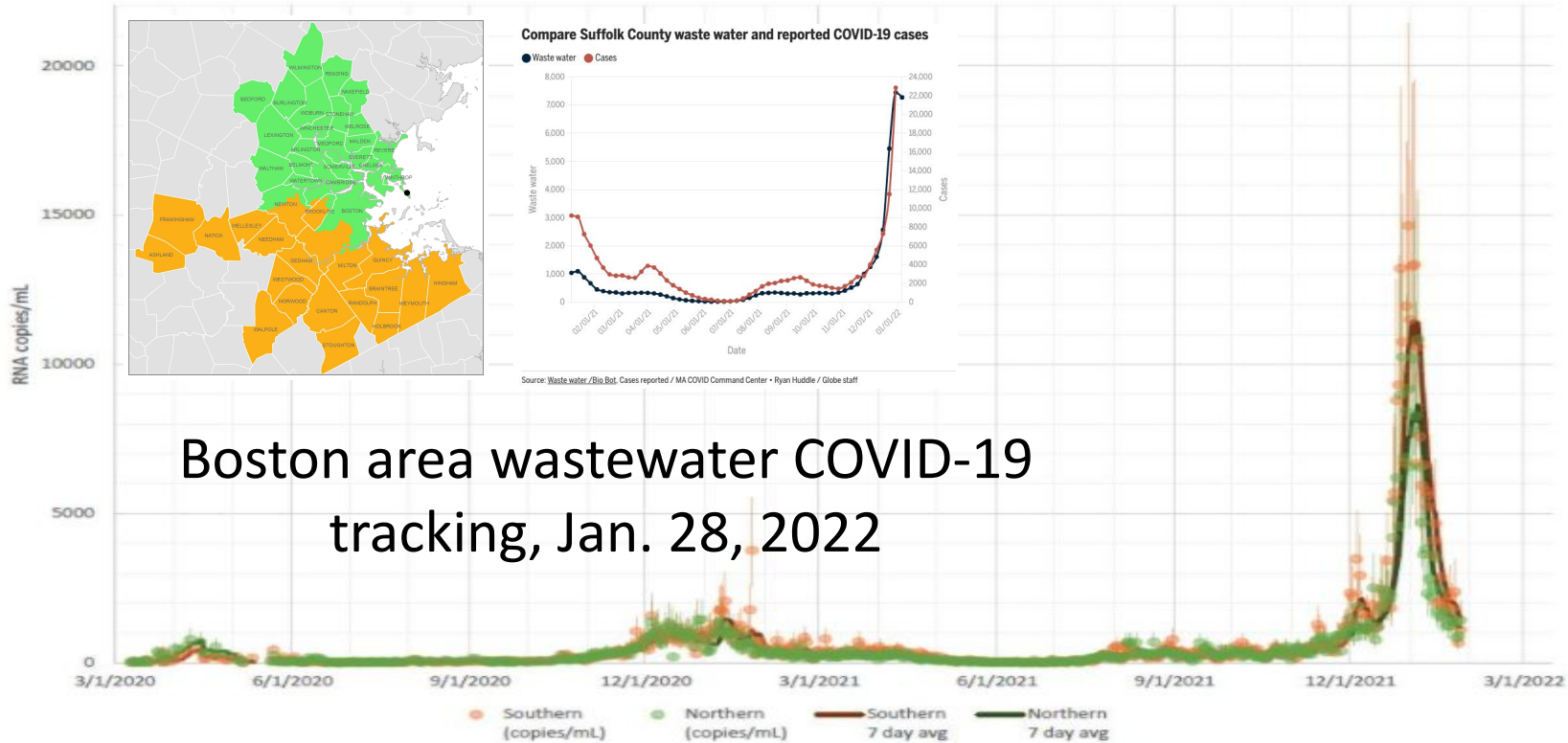
Age Group

All Ages ▾



Wastewater surveillance

DITP Viral RNA Signal by Date



Boston area wastewater COVID-19 tracking, Jan. 28, 2022

Acknowledgements and references

- Collaborators
 - John Kraemer, Rachael Piltch-Loeb, Abbey Woolverton, Samantha Schlegeter
- References
 - Stoto, Kraemer & Piltch-Loeb, Better metrics to guide the COVID-19 response. [Harvard Data Science Review](#), 2023
 - A Framework for Assessing Mortality and Morbidity After Large-Scale Disasters, [NASEM](#), 2020
 - Stoto, *et al.*, A national framework to improve mortality, morbidity, and disparities data for COVID-19 and other large-scale disasters, [AJPH](#), 2021
 - COVID-19 data are messy, [Globalization & Health](#), 2022
 - Stoto, *et al.*, Differential COVID-19 mortality in the United States, [Preprint](#)



WE'RE TAKING A BREAK

**EVENT WILL RESUME
SHORTLY**



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Using the Criminal Justice Administrative Records System to Improve Administration of the Criminal Justice System

Keith Finlay, Ph.D.

Research Economist, U.S. Census Bureau

Brian Miller, Ph.D.

General Programmer/Analyst, University of Michigan

Jordan Papp, Ph.D.

Project Manager, University of Michigan



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Using the Criminal Justice Administrative Records System to Improve Administration of the Justice System

Jordan Papp

University of Michigan

Brian Miller

University of Michigan

Keith Finlay

U.S. Census Bureau

May 24th, 2023

Panel topics

1. Project overview
2. Justice Caseload Analysis Tool
3. Research enabled by CJARS
4. Research data access

Project overview

Incomplete criminal justice data infrastructure

- Limits how performance is measured, which policy questions are asked
- Leads to varying definitions of recidivism
- Makes it difficult to identify effective policy levers
- Prevents comprehensive benefit-cost analyses

What is CJARS?

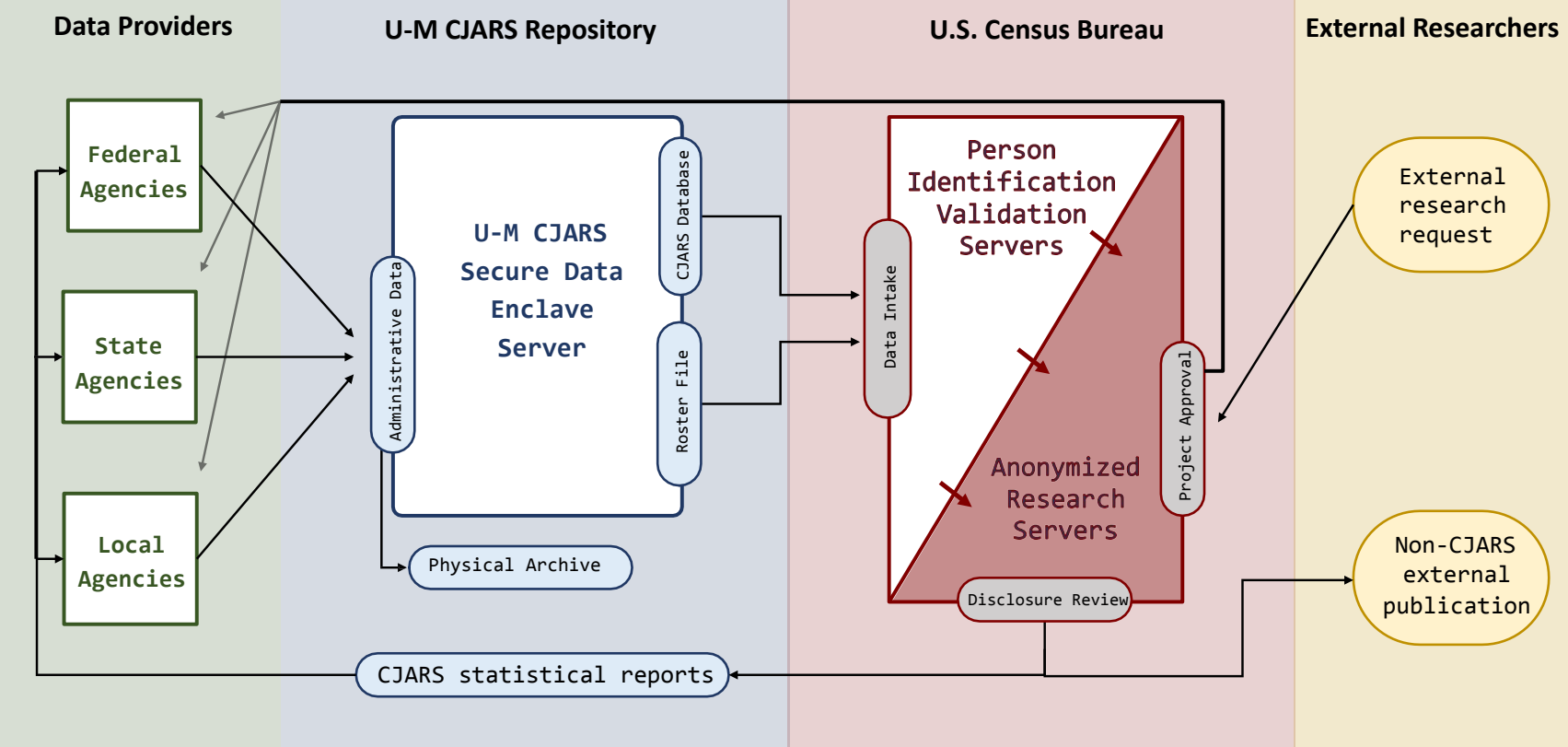
CJARS, founded in 2016, is a joint data infrastructure project between the University of Michigan and the U.S. Census Bureau

Building a novel data platform to modernize research and statistical reporting on the U.S. criminal justice system, including:

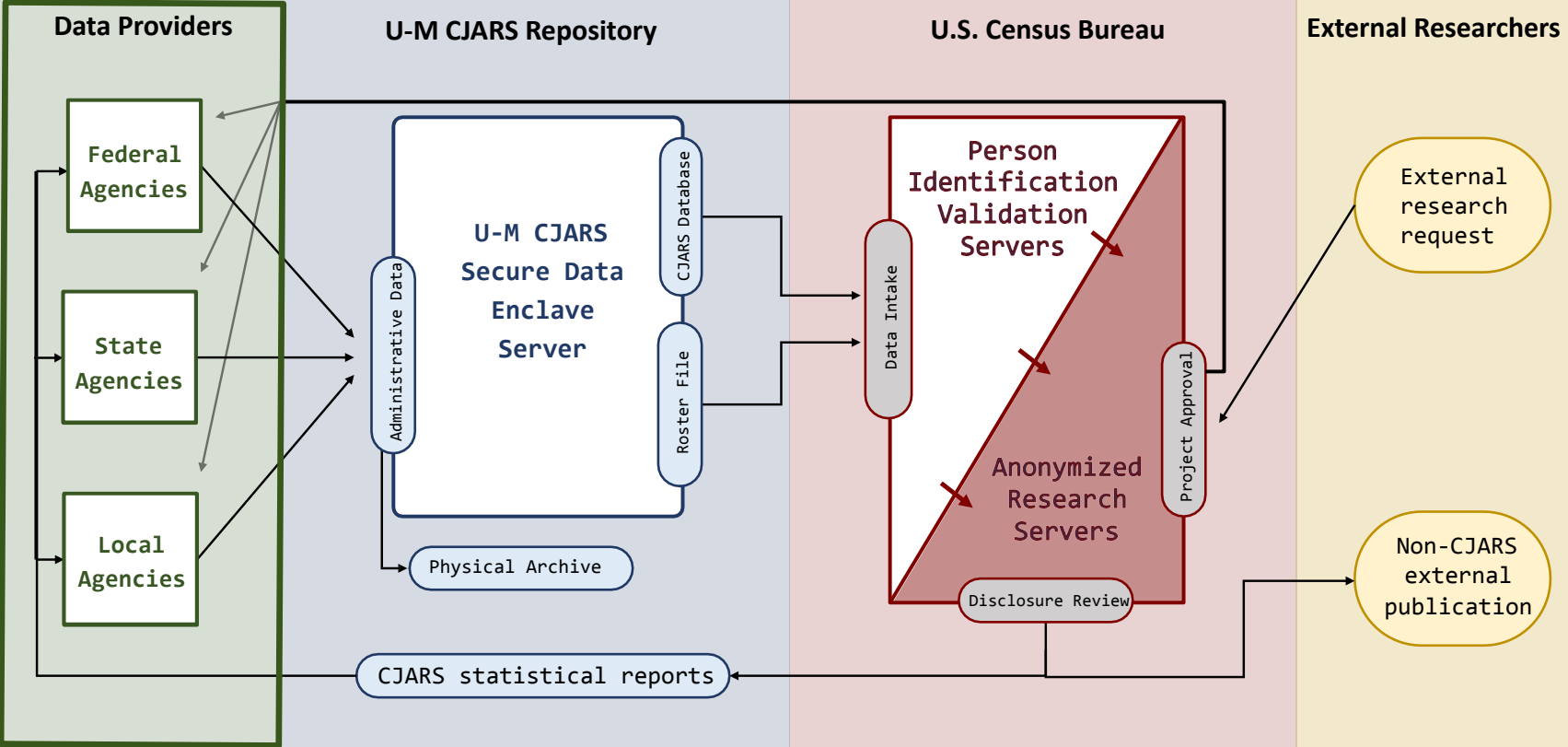
- Event-level criminal justice data with nationwide scope
- Tracking across key milestones in the justice system
- Capacity to link with individual-level survey and administrative data at the U.S. Census Bureau

Financial support from the National Science Foundation, the Annie E. Casey Foundation, the Bill & Melinda Gates Foundation, Arnold Ventures, the Robert Wood Johnson Foundation, the University of Michigan, and the U.S. Census Bureau

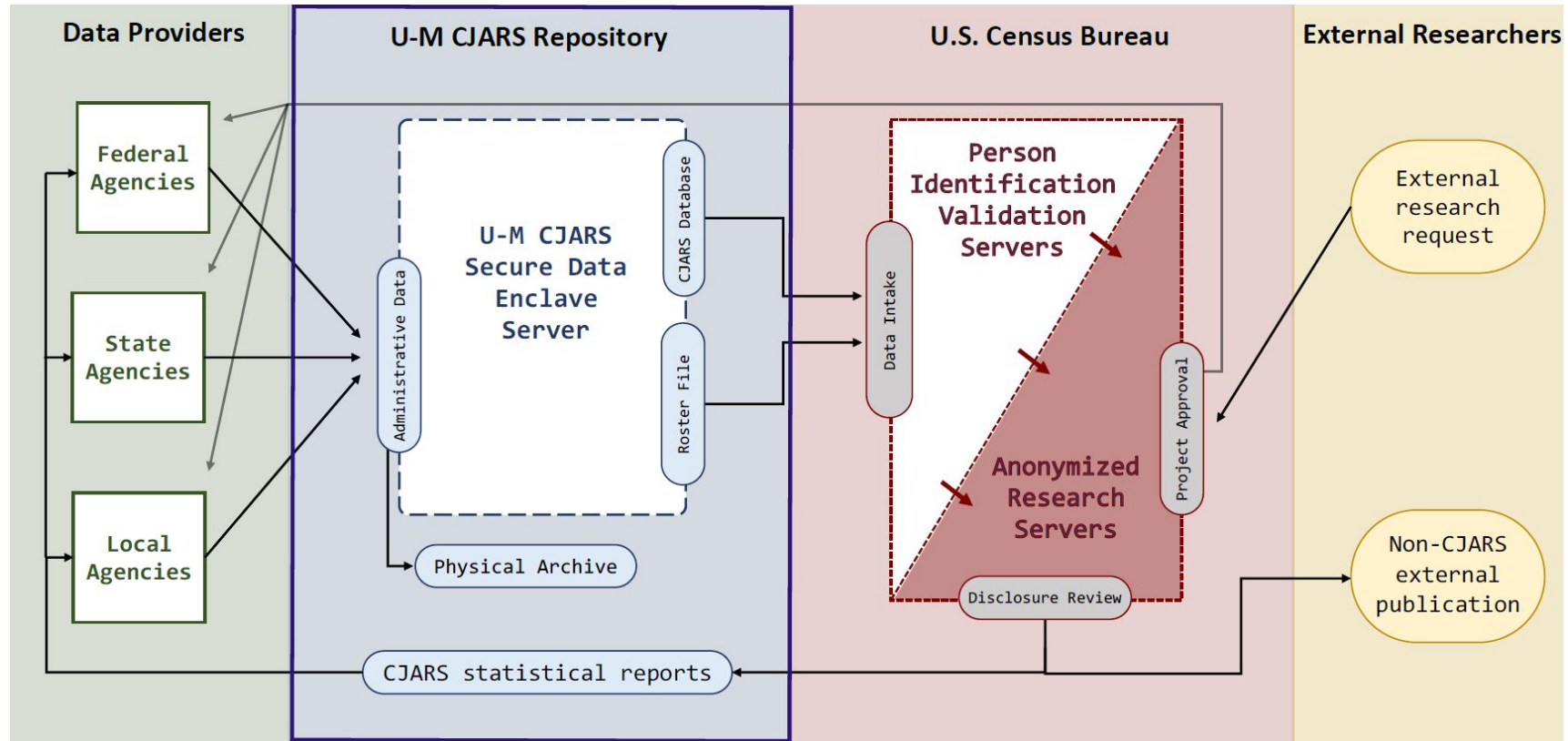
CJARS at a glance



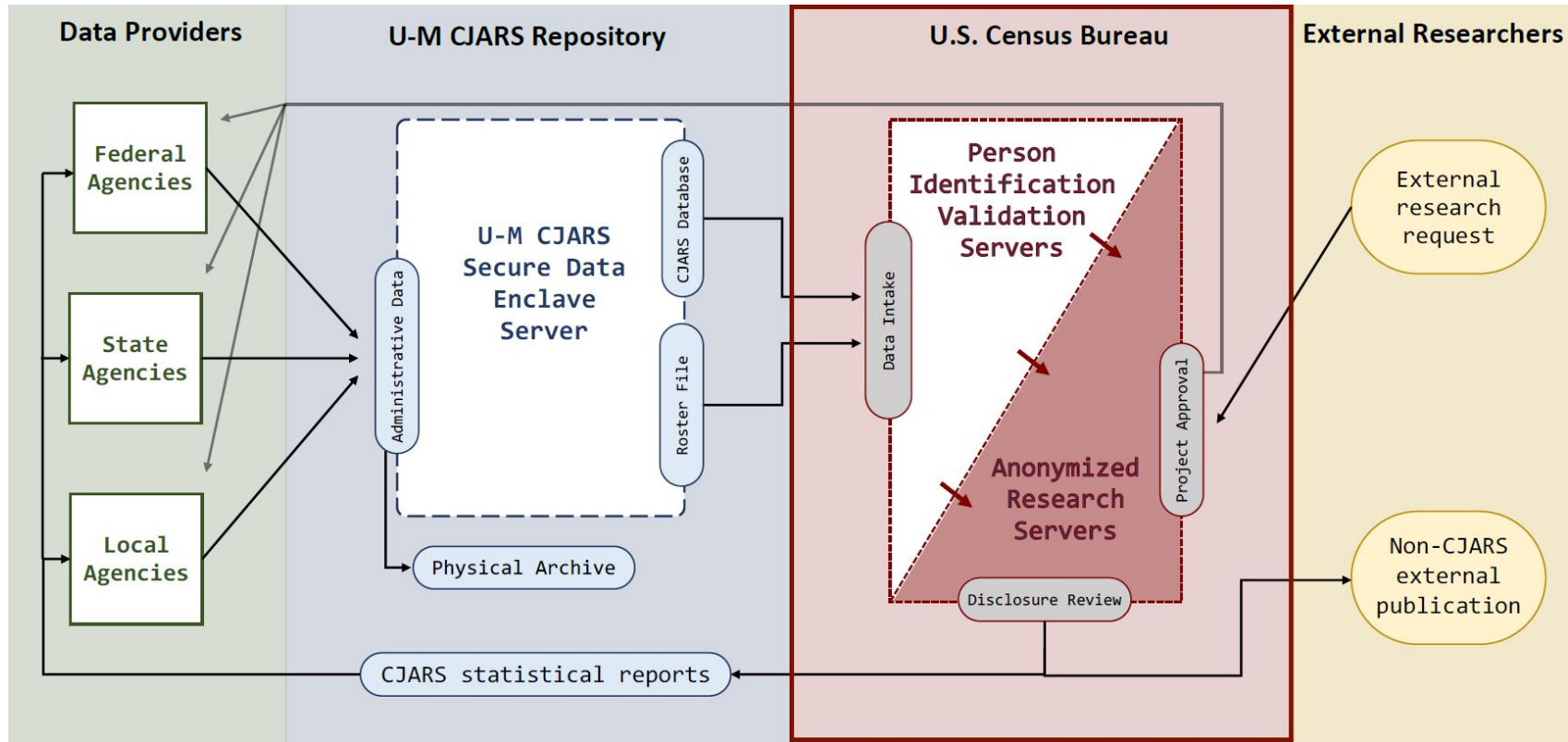
CJARS at a glance



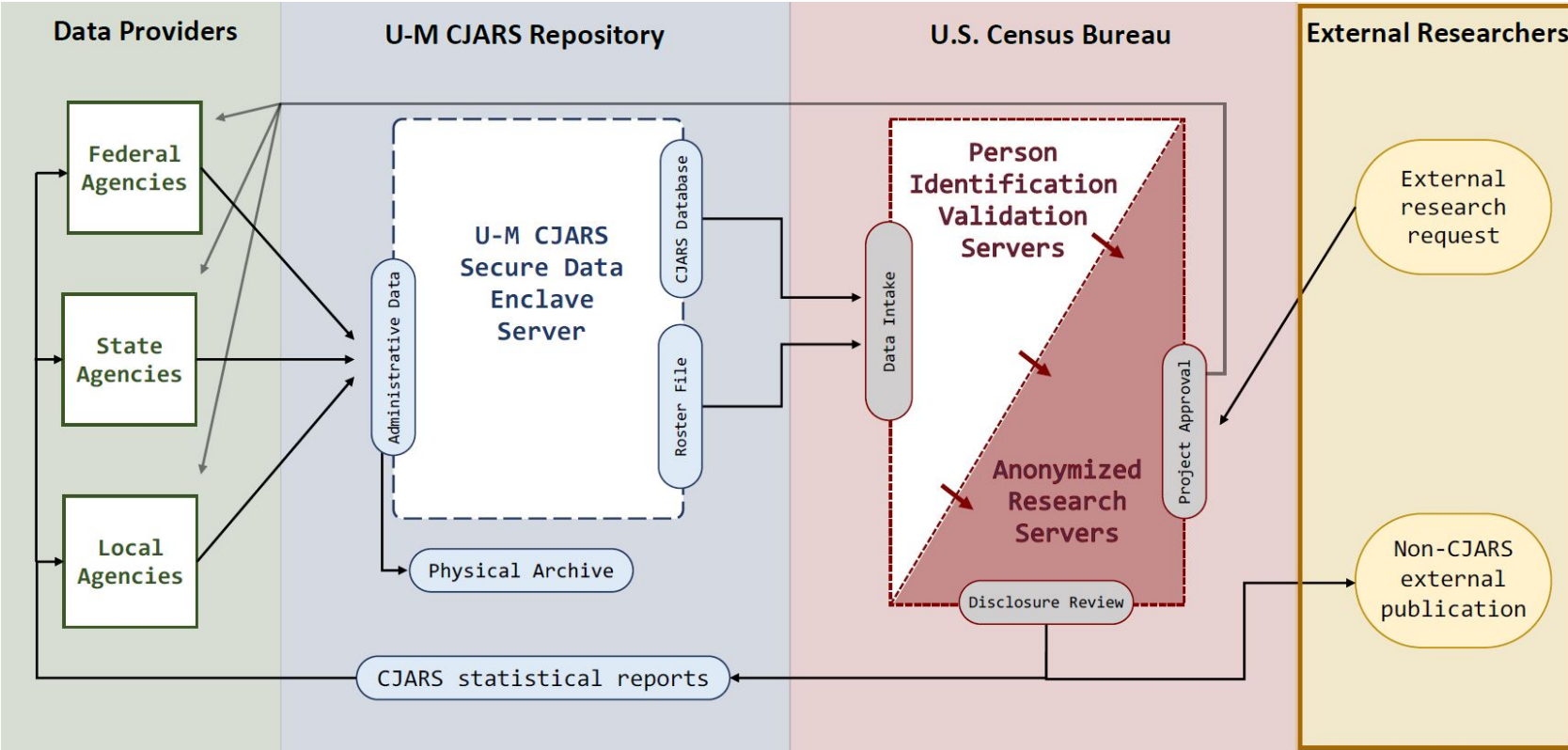
CJARS at a glance



CJARS at a glance



CJARS at a glance



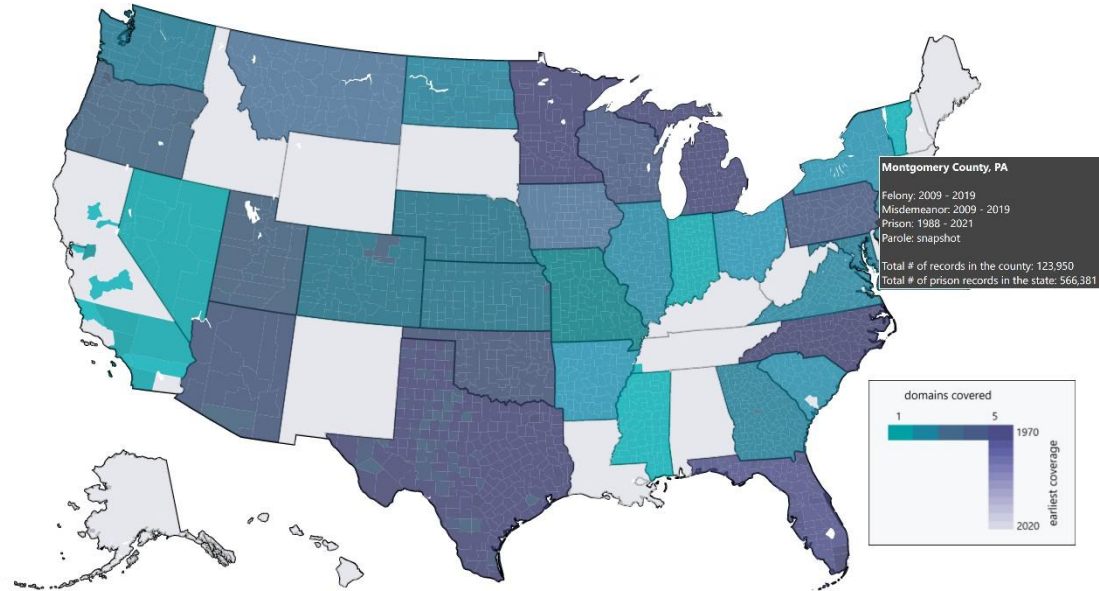
Why do we need CJARS?

Key contributions over existing resources:

1. Longitudinal, multi-jurisdictional data is collected, harmonized, and linked to track individuals across space and time
2. Evolution of a criminal episode is traced through the justice system
3. Built for integration with socio-economic survey and administrative data held by the Census Bureau
4. Secure, responsible research access options without gatekeeping

CJARS coverage summary

- Data from >1000 counties
- 3b+ records
- 197m CJ events
- 41m unique individuals
- States with coverage of state court, state DOC, and/or state repository represent 68% of U.S. population



Justice Caseload Analysis Tool

Building a high-quality data product with a small team

- CJARS collects data from hundreds of criminal justice agencies, from municipal police departments to county courts to departments of corrections
- More than 3 billion rows of raw data from 30 states covering 197 million criminal justice events and 41 million unique individuals
- Core goals of public dashboard:
 - Present a comprehensive view of the criminal justice system
 - Leverage linkage with Census data
 - Track cohorts over time

Producing aggregate statistics

- Three kinds of aggregate statistics:
 - **Caseloads** – per capita rates of incarceration, charges, convictions, etc.
 - **Case processing characteristics** – case processing time, average incarceration spell length, etc.
 - **Follow-up statistics**
 - Recidivism
 - Health and economic outcomes
- Master Outcomes file merges CJARS roster with administrative records from CMS, HUD, SSA, IRS, and Census Bureau

Review process for aggregate statistics

- Two-stage pipeline:
 - Caseload statistics go through algorithmic and human review
 - Once a caseload statistic is validated, any other statistics that it supports are cleared for review
- For example, **average incarceration spell length** for a jurisdiction and date range can only be reviewed once the respective **incarceration entries and exits** have been validated

Automated review pipeline

1. Initial demographic review
2. An ensemble of heuristics and statistical checks flag individual data points
3. Human review of caseload statistics via interactive dashboard
4. Propagate results of caseload review to dependent statistics
5. Repeat the pipeline and human review process for case processing characteristics and follow-up statistics

```
In [2]: choose_one_stat_name(data_lod=test_data_lod, stat_names_in_scope=stat_names_in_scope, flagged_checkbox=flagged_checkbox)
```

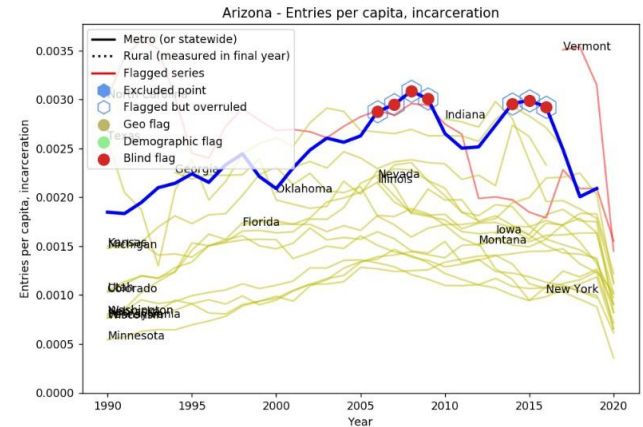
Statistics n... Flagged series only

State:

Show related series

County:

Figure 16



Navigation icons: Home, Back, Forward, Zoom, Full Screen, Print

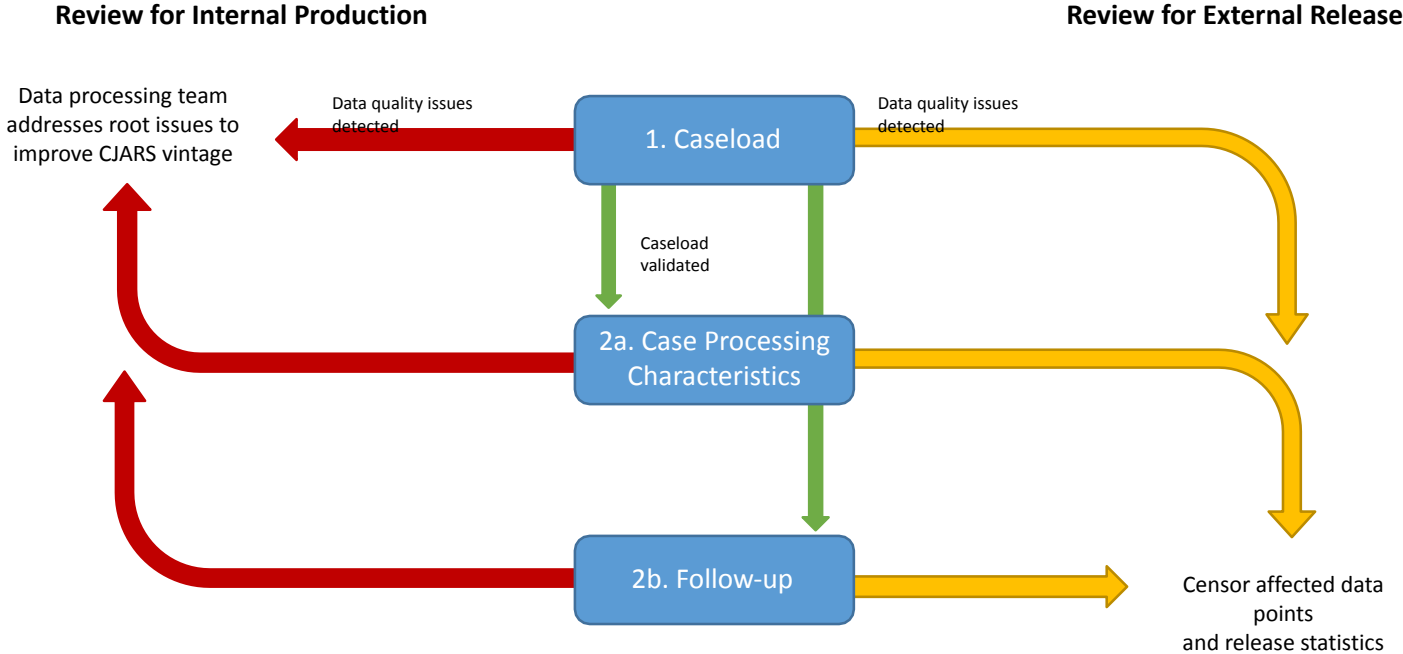
› Data points excluded by algorithm or human review

Average denominator for selected jurisdiction: 5,597,522

Flags in the automated review pipeline

- Demographic check – look for jurisdictions with race, gender, and age profiles outside of reasonable upper and lower bounds
- ‘Blind’ check for outliers – look for extreme high and low values across all years and jurisdictions
- Autocorrelation, lag 1 – look for consistency of trend
- Urban/rural comparison – look for years in which the typical relationship between urban and rural counties changes
 - Aggregating counties into bins by size

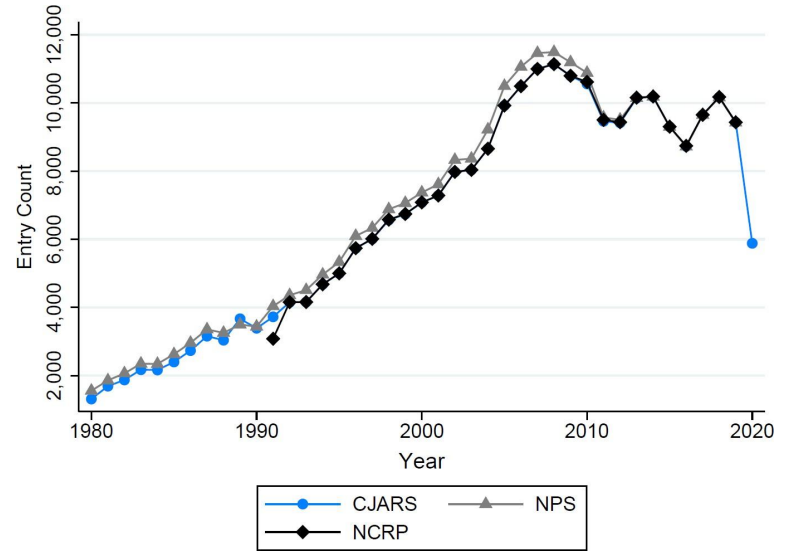
Dashboard supports internal review and external release



Benchmarking CJARS against public data

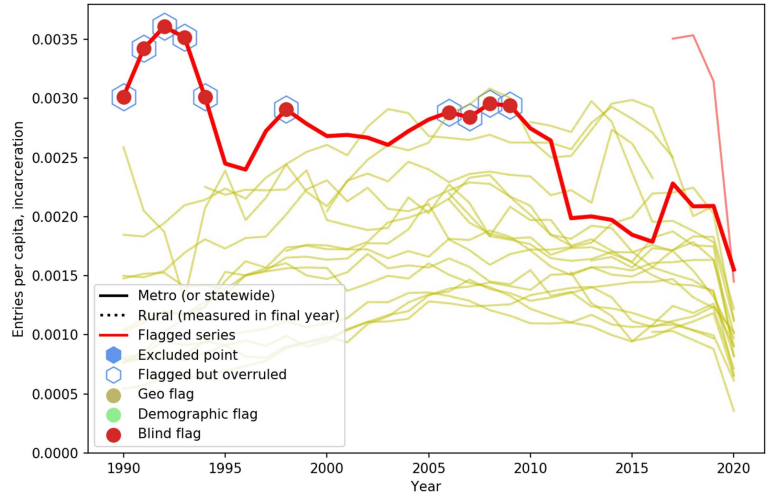
- Sources:
 - Annual Parole Survey and Annual Probation Survey (APS)
 - National Prisoner Statistics Program (NPS)
 - National Corrections Reporting Program (NCRP)
- High quality external data is available for incarceration, probation, and parole
- Adjudication and arrest data are harder to benchmark

Colorado - Raw count of incarceration entries by year

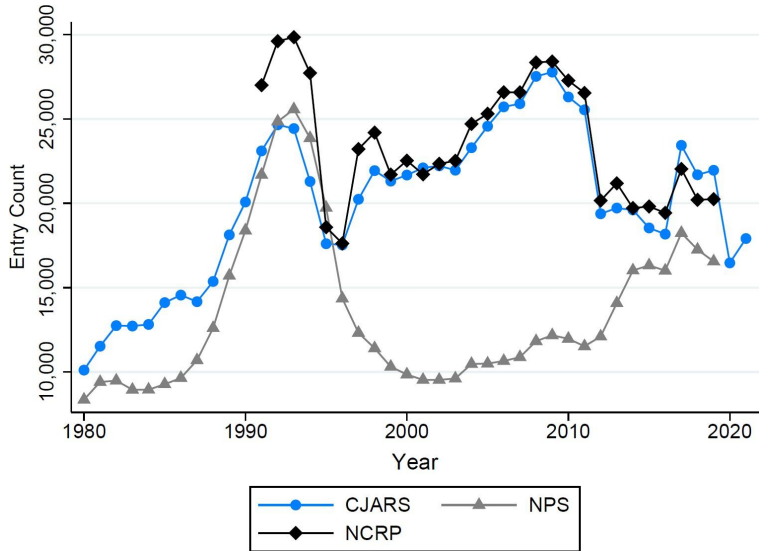


Reviewing flagged series with multiple methods

North Carolina - per capita incarceration entries

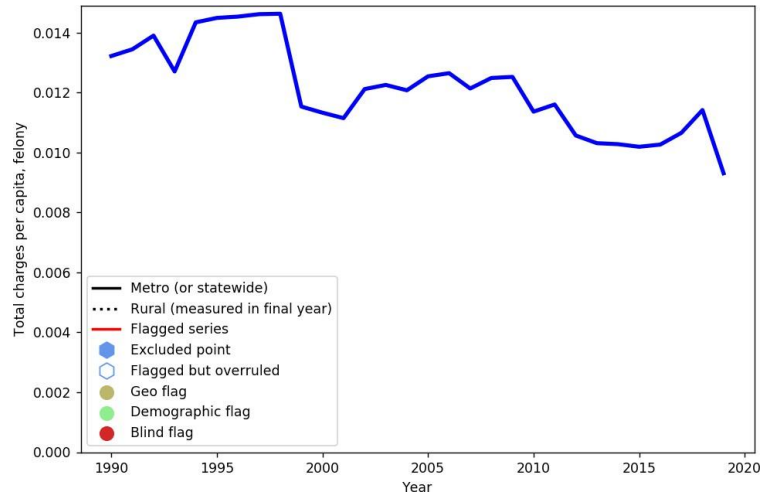


North Carolina - Raw count of prison entries

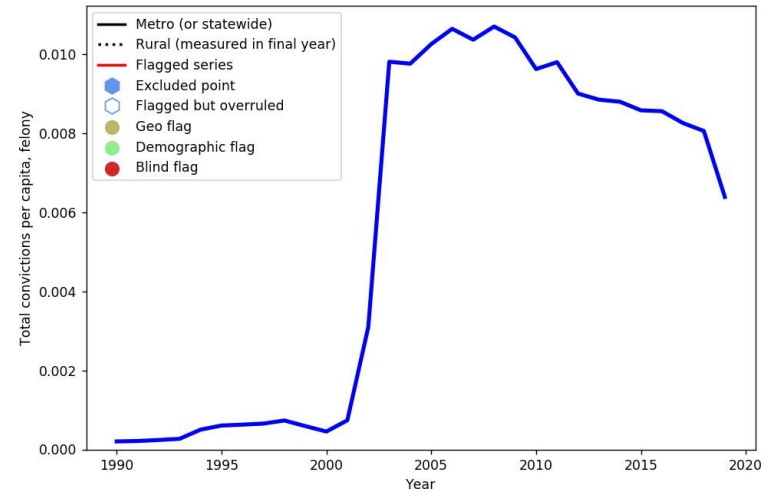


Identifying coverage issues within and across counties

Felony charges per capita

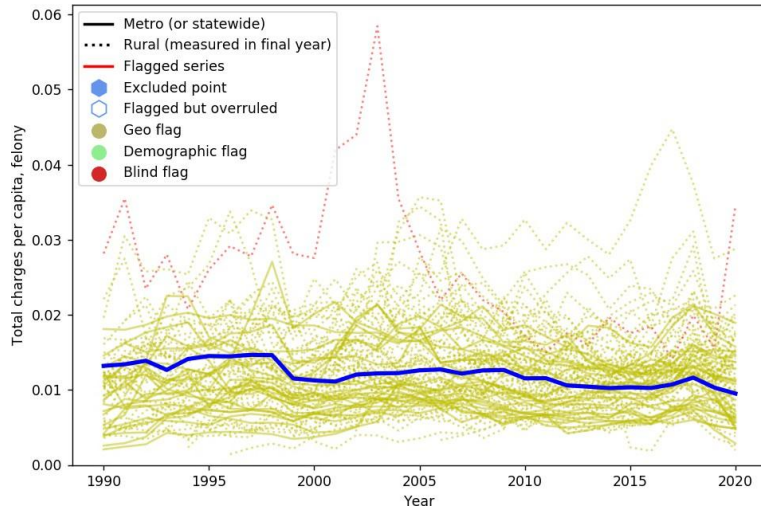


Felony convictions per capita

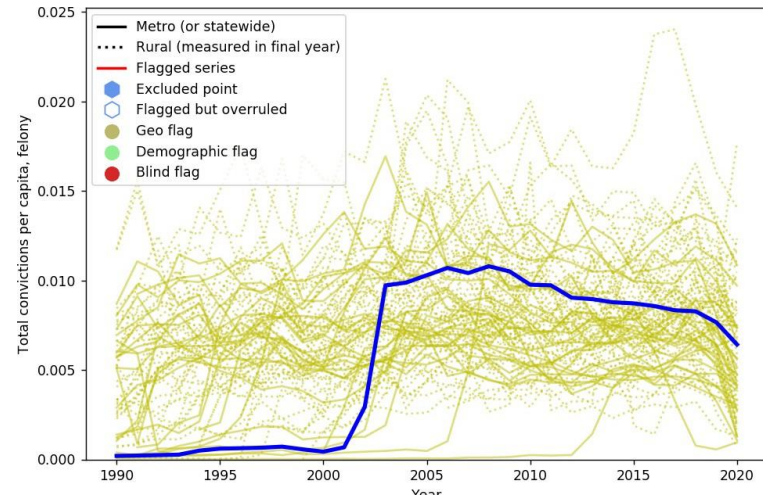


Identifying coverage issues within and across counties

Felony charges per capita

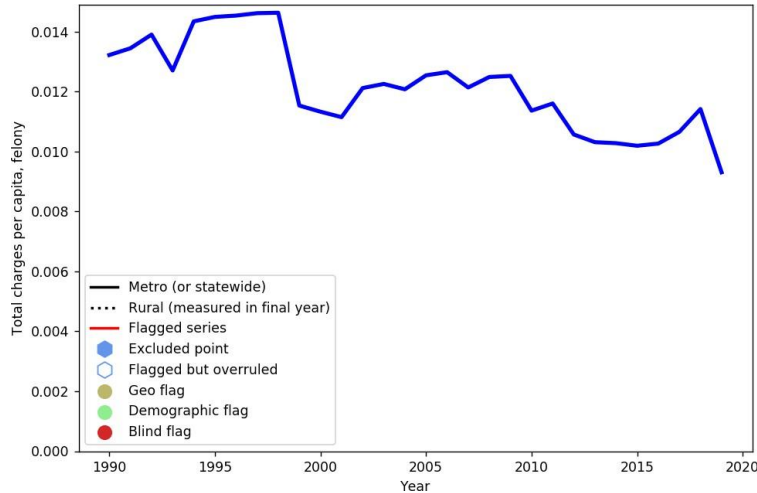


Felony convictions per capita

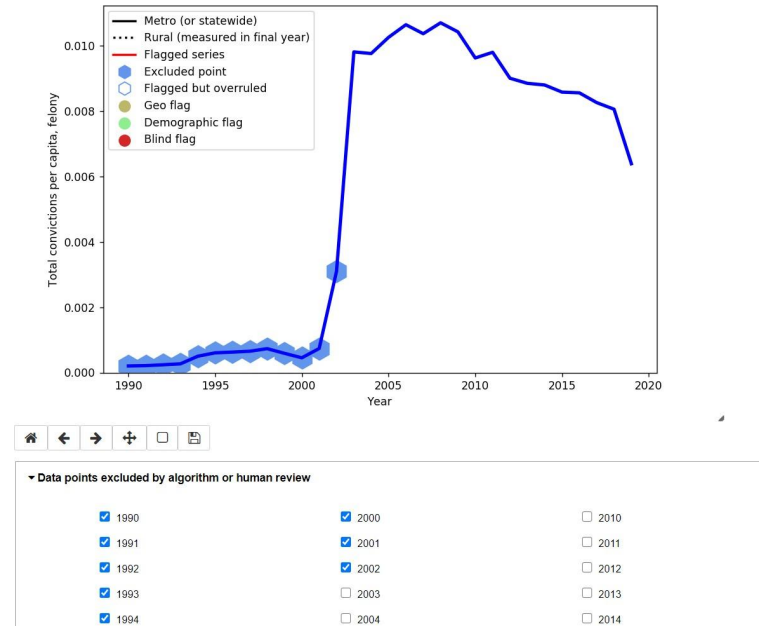


Censoring statistics for public release

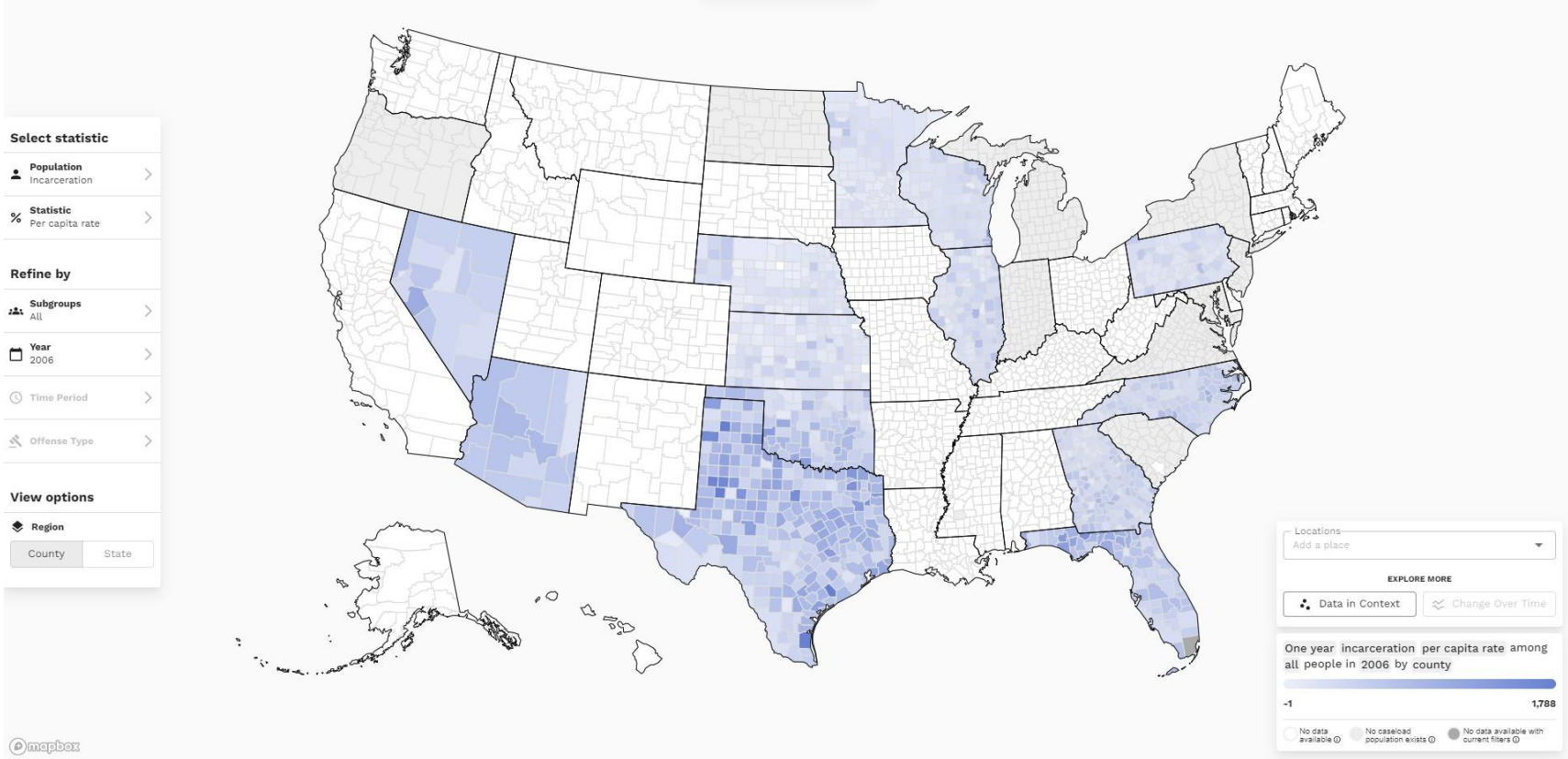
Felony charges per capita



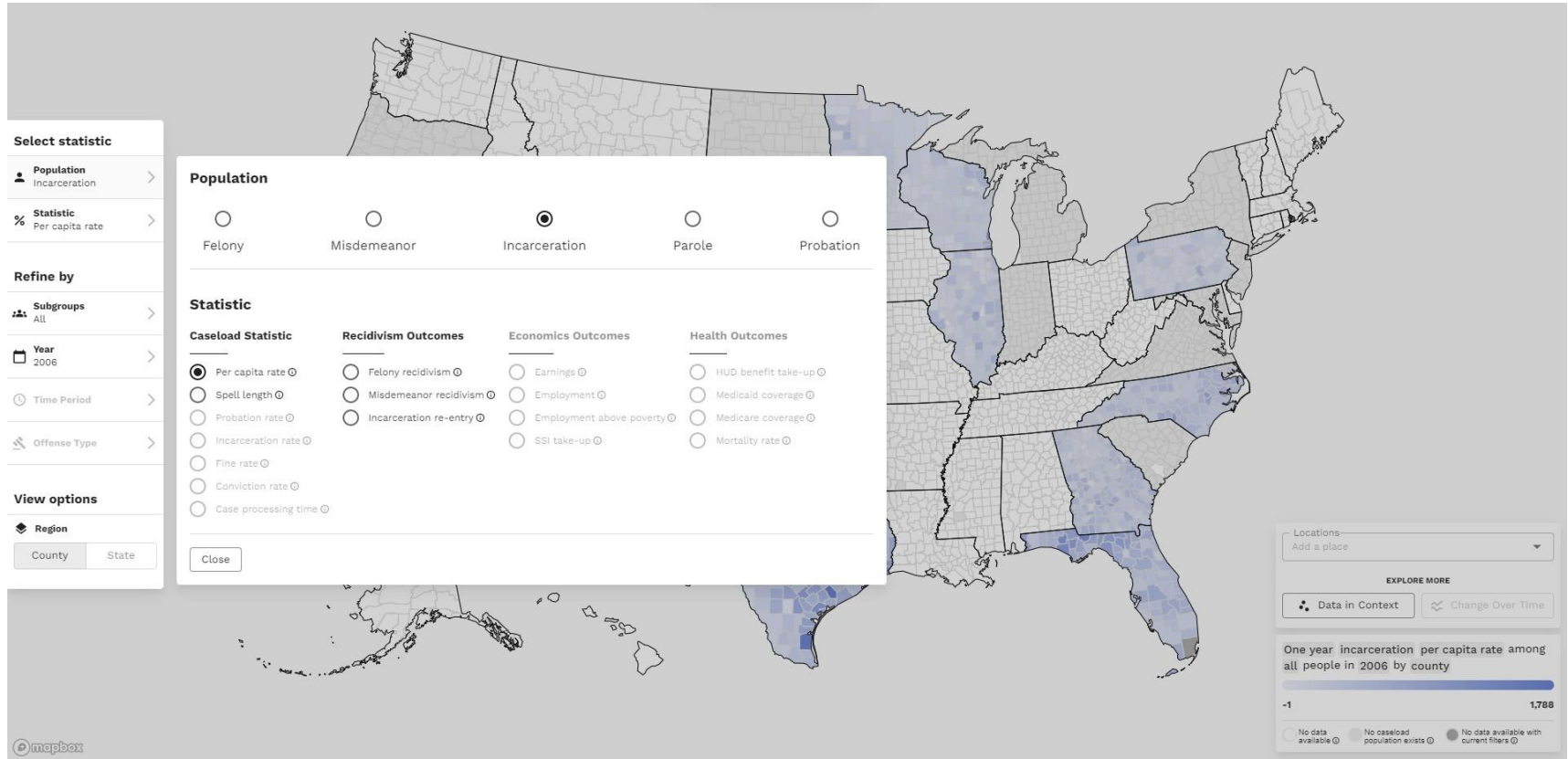
Felony charges per capita, with dashboard interface



Dashboard preview



Dashboard preview



Research enabled by CJARS and researcher data access

Keith Finlay

U.S. Census Bureau

May 24, 2023

Any opinions and conclusions expressed herein are those of the author and do not necessarily represent the views of the U.S. Census Bureau. While this work was not subject to formal Census Bureau content review, Census staff reviewed all statistical output to ensure that no confidential information was disclosed. Results were approved for release by the Census Bureau's Disclosure Review Board, Data Management System number P-7500378 and authorization numbers CBDRB-FY19-444, CBDRB-FY21-ERD002-005, CBDRB-FY21-ERD002-017, CBDRB-FY22-ERD002-001, CBDRB-FY22-ERD002-003.

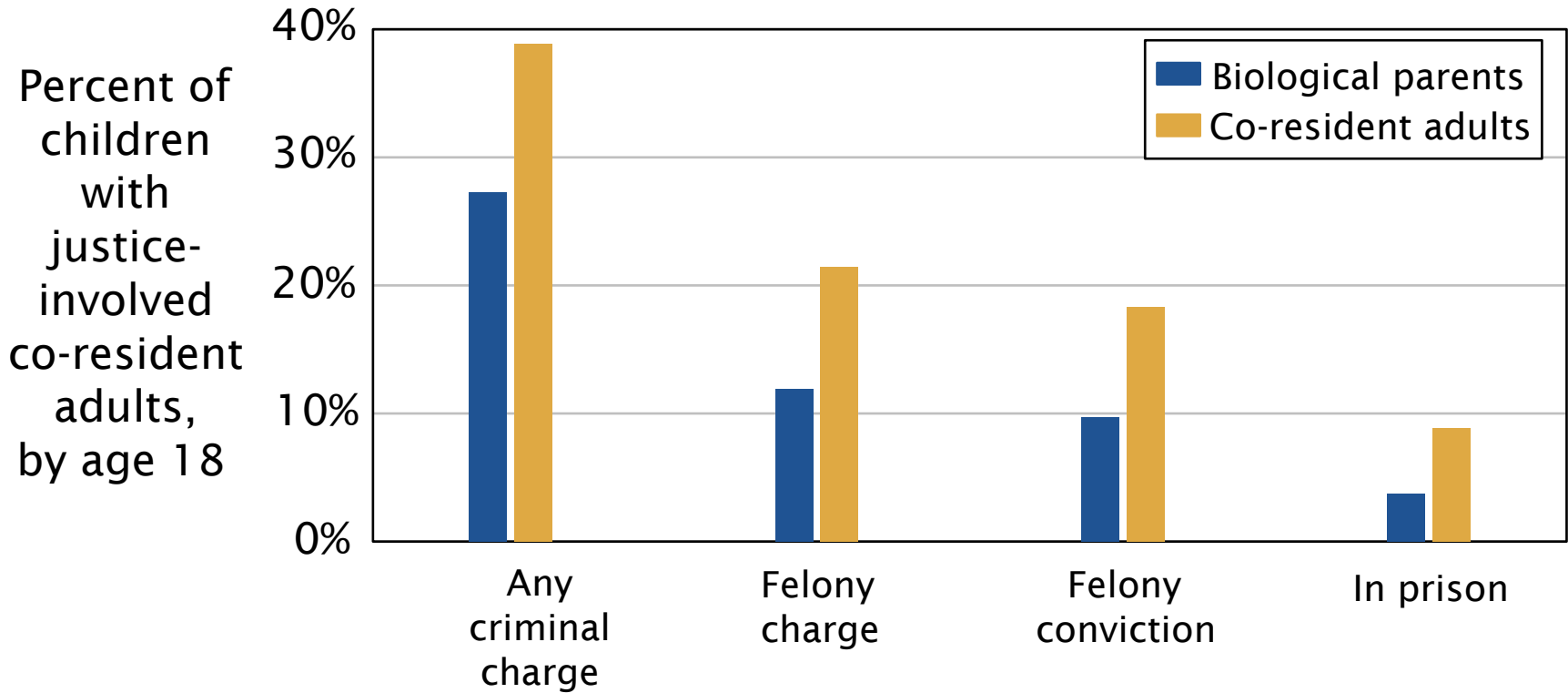
New research enabled by CJARS

- ▶ As part of building data infrastructure, we use research to improve the quality of our data
- ▶ CJARS has enabled new statistics about the population that interacts with the CJ system
 - ▶ Children living with justice-involved adults
 - ▶ Self-employment

Children and justice-involved co-resident adults

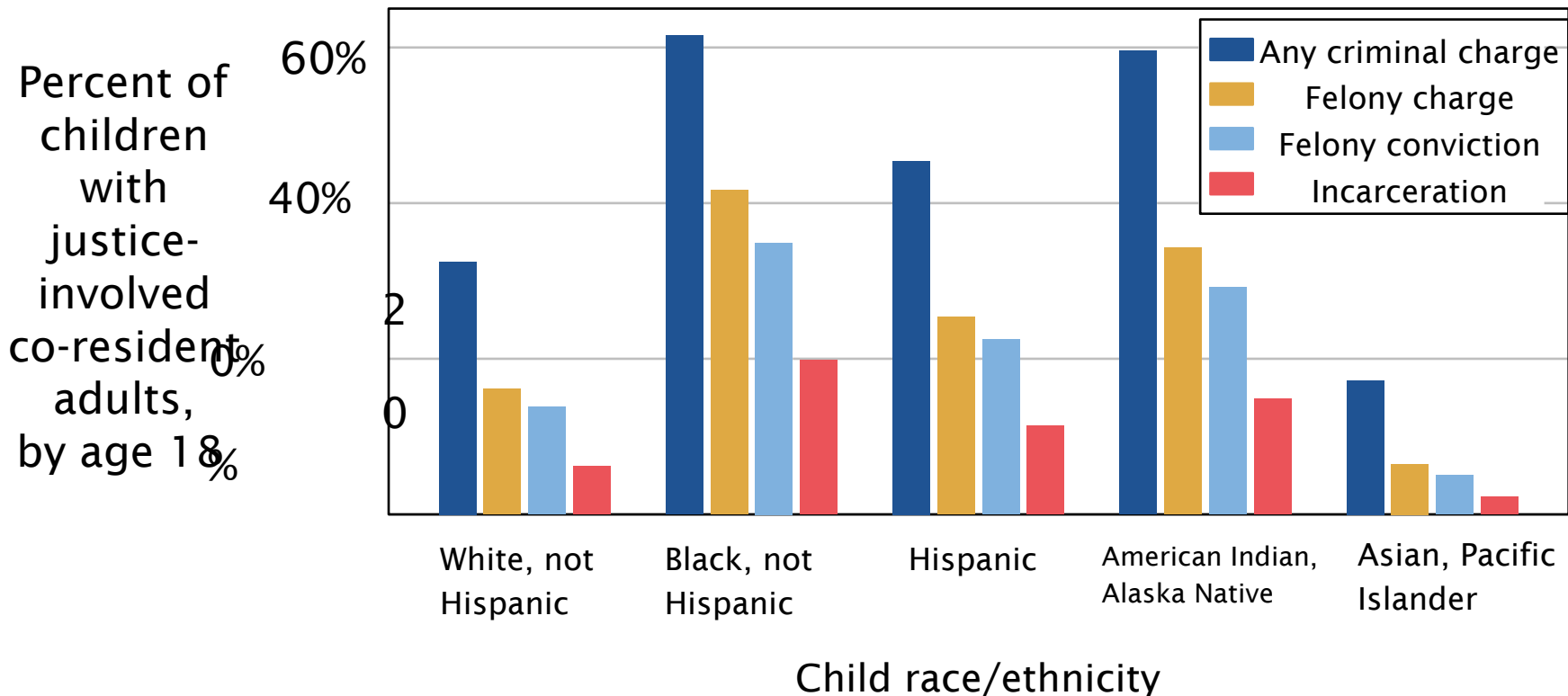
- ▶ What proportion of children born between 1999 and 2005 have lived with a justice-involved adult?
 - ▶ Significant increase in the population that interacts with the criminal justice system
 - ▶ How many children connected to those individuals?
 - ▶ Via biological parents
 - ▶ Via other co-resident adults
 - ▶ How does impact vary by race and ethnicity?
- ▶ Link CJARS to family and residential history crosswalks synthesized from administrative and survey records

Children and justice-involved co-resident adults



Source: Calculations from CJARS data linked to family and residential history crosswalks for the following states: AZ, FL, MD, MI, NE, NJ, NC, ND, OR, PA, TX, WA, and WI. Note: All results were approved for release by the U.S. Census Bureau, Data Management System number: P-7500378 and approval number CBDRB-FY22-ERD002-001.

Black, Hispanic, AIAN children at higher risk

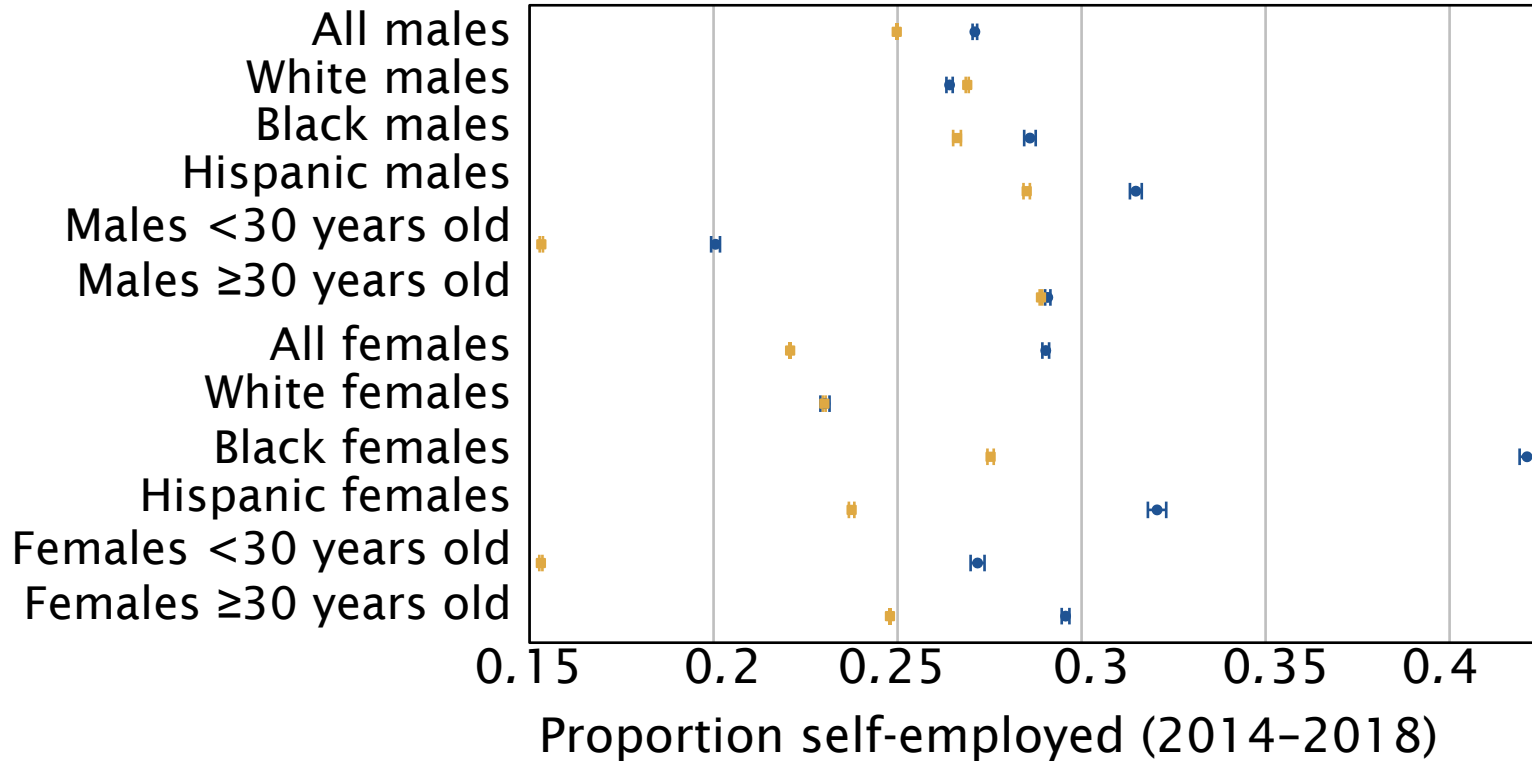


Source: Calculations from CJARS data linked to family and residential history crosswalks and Title 13 race and ethnicity data for the following states: AZ, FL, MD, MI, NE, NJ, NC, ND, OR, PA, TX, WA, and WI. Note: All results were approved for release by the U.S. Census Bureau, Data Management System number: P-7500378 and approval number CBDRB-FY22-ERD002-001.

Self-employment of justice-involved people

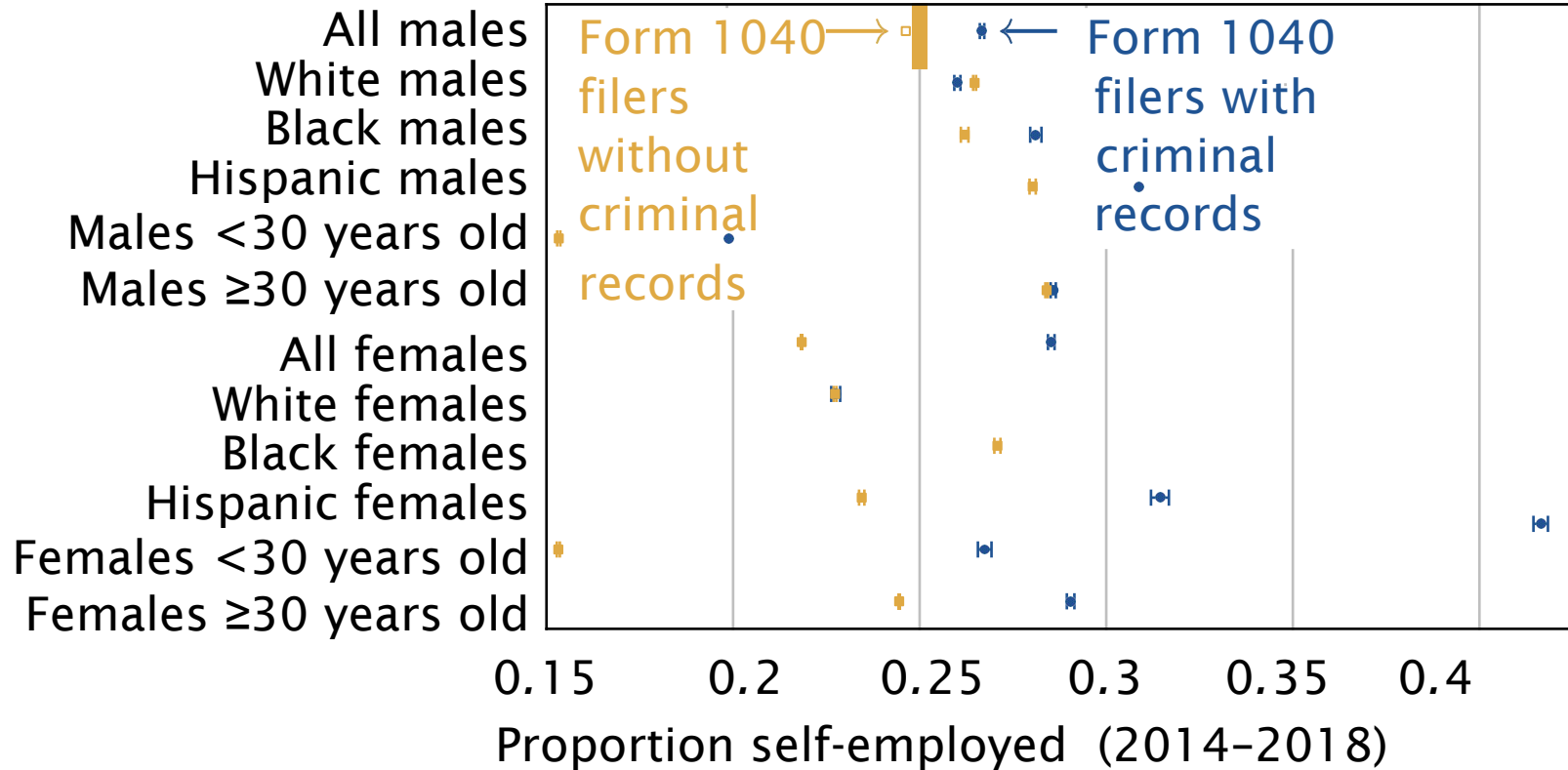
- ▶ What proportion of the justice-involved people are self-employed?
 - ▶ Growing evidence that they use self-employment as an alternative to employer-based jobs
- ▶ Link CJARS with IRS Form 1040 ⇒ identify who files Schedule C

Justice-involved more likely to be self-employed

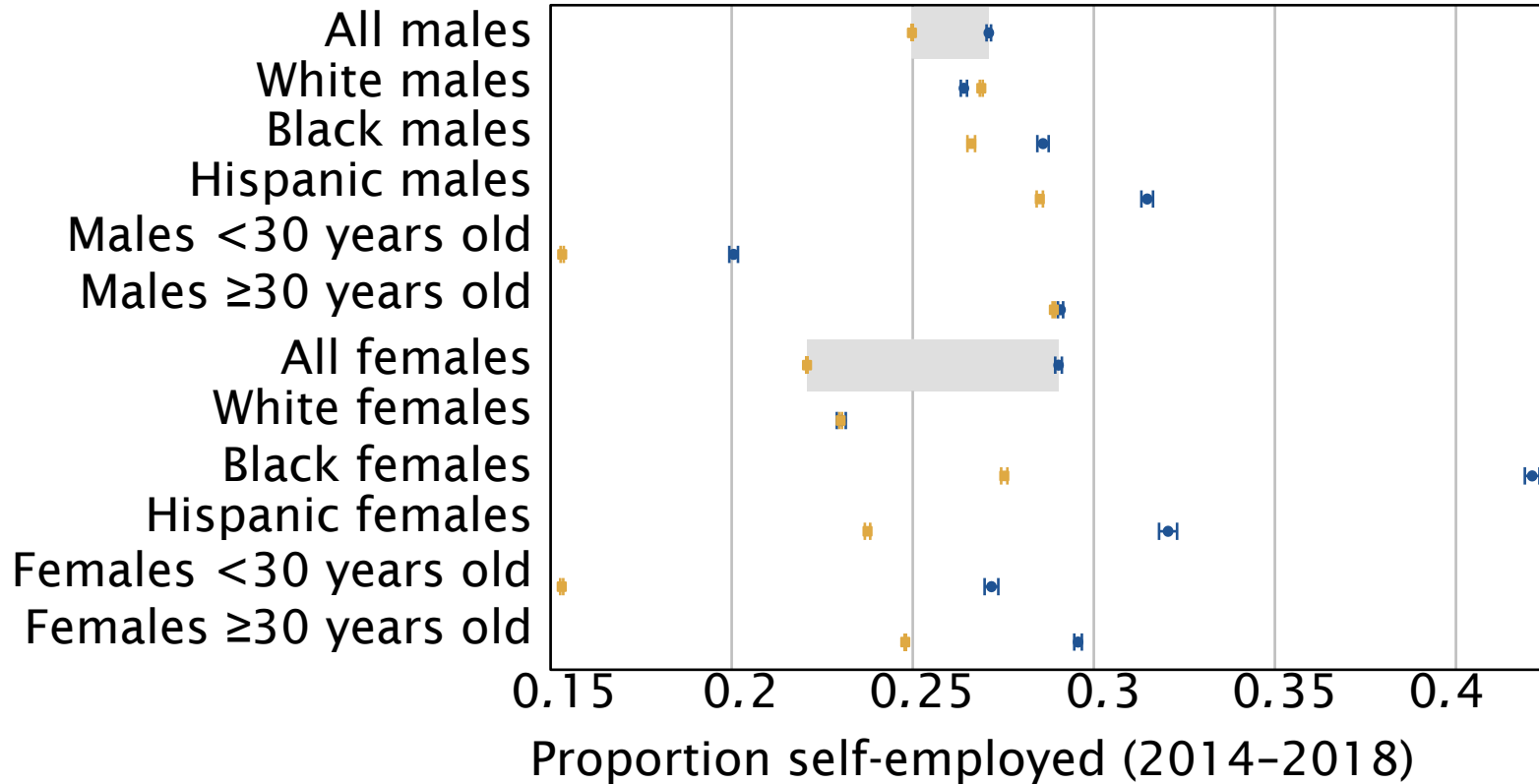


Source: Calculations from CJARS data linked to IRS 1040 Forms and Schedule Cs for the following states: AZ, MI, NC, TX, WI. Note: All results were approved for release by the U.S. Census Bureau, Data Management System number: P-7500378 and approval numbers CBDRB-FY21-ERD002-005 and CBDRB-FY22-ERD002-003.

Justice-involved more likely to be self-employed

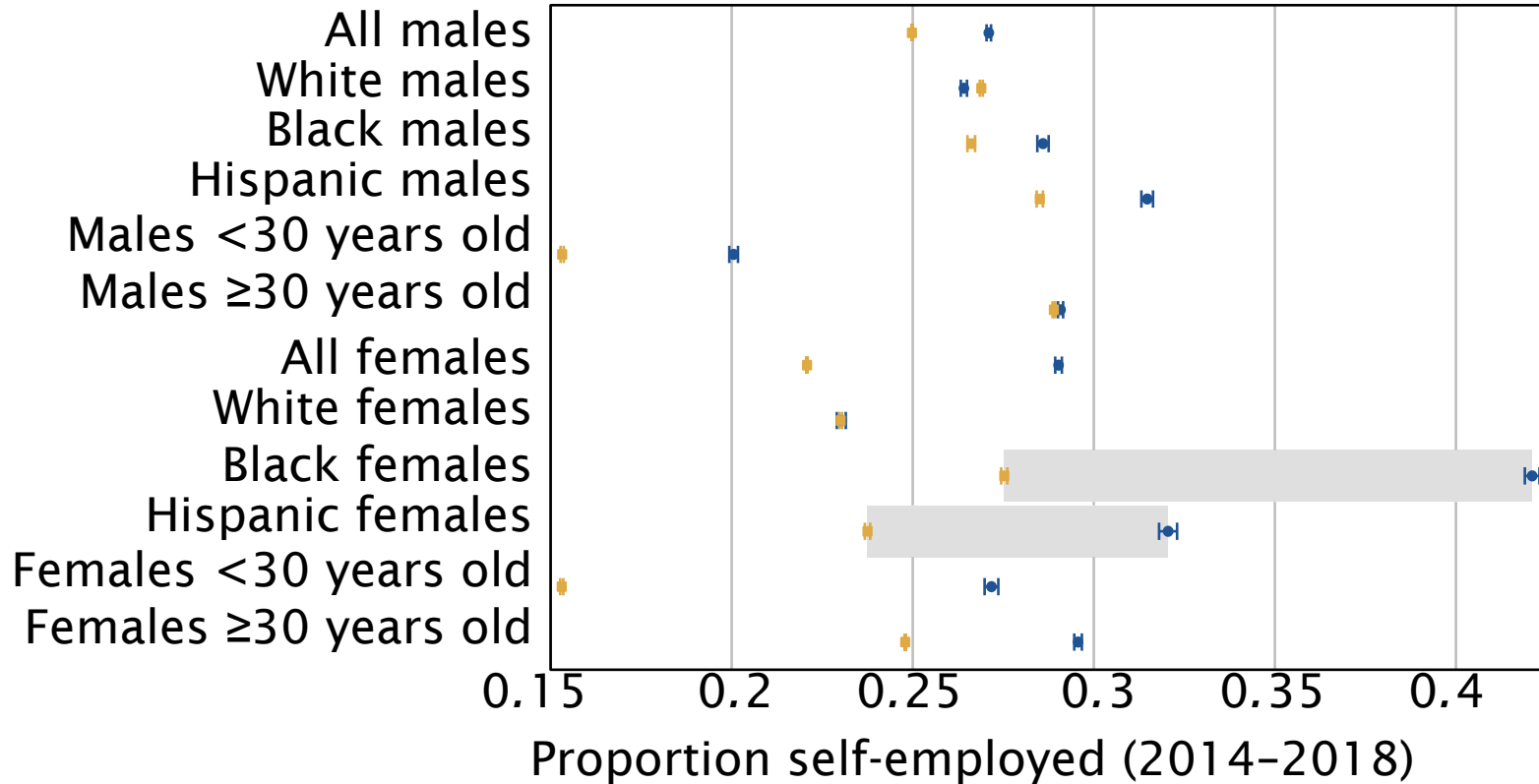


Justice-involved more likely to be self-employed



Source: Calculations from CJARS data linked to IRS 1040 Forms and Schedule Cs for the following states: AZ, MI, NC, TX, WI. Note: All results were approved for release by the U.S. Census Bureau, Data Management System number: P-7500378 and approval numbers CBDRB-FY21-ERD002-005 and CBDRB-FY22-ERD002-003.

Justice-involved more likely to be self-employed



Justice-involved more likely to be self-employed



CJARS enables transformational measurement

- ▶ Large percentage of children have lived with justice-involved adults
- ▶ Higher relative contact for Black, Hispanic, and AIAN adults and children
- ▶ Justice involved have lower employer-based employment but higher rates of self-employment than comparison groups
- ▶ Researchers can access CJARS data through the Federal Statistical Research Data Center network to develop new evidence to support administration of the justice system

CJARS data documentation

- ▶ Project description
- ▶ Data collection methods
- ▶ Data holdings and structure
- ▶ Linkage process, algorithms
- ▶ Variable codebook, descriptive statistics
- ▶ [https://cjars.org/
data-documentation-download](https://cjars.org/data-documentation-download)



Criminal Justice Administrative Records System (CJARS)

Keith Finlay¹ and Michael

Mueller-Smith² ¹U.S. Census Bureau

²University of Michigan

2022-12-14

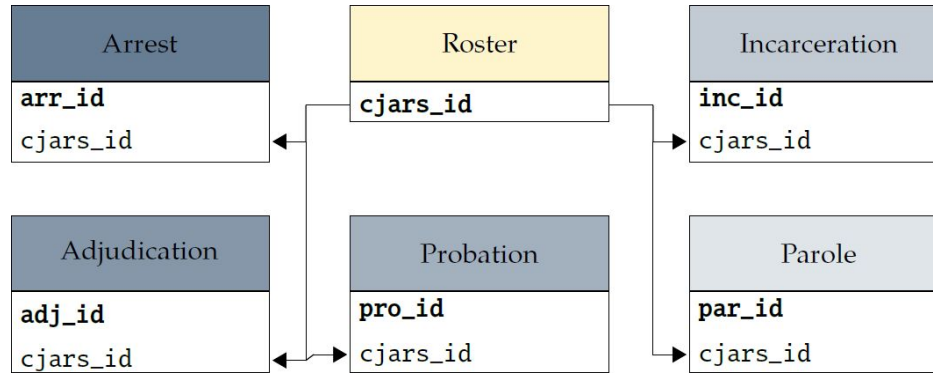
Abstract

The Criminal Justice Administrative Records System (CJARS) is a nationally integrated data repository designed to transform research and policymaking on the United States criminal justice system. At the University of Michigan, CJARS collects longitudinal electronic records from criminal justice agencies and harmonizes these records to track a criminal episode across all stages of the system. At the U.S. Census Bureau, harmonized criminal justice records can be linked anonymously at the person-level with extensive social, demographic, and economic information from national survey and administrative records. The CJARS project is a partnership between the Census Bureau and University of Michigan with the goal of expanding research and statistical reporting on the criminal justice system.

The project website is <https://cjars.org>. The [latest version of the data documentation](#) can always be found there. Data users who have questions about CJARS can contact cjars-data-users@umich.edu.

Any conclusions expressed herein are those of the authors and do not necessarily represent the views of the U.S. Census Bureau. *All statistics in this document are based on CJARS data at the University of Michigan except for those explicitly labeled as sourced from Census Bureau data protected by 13 USC §9a.* This document meets all of the U.S. Census Bureau Disclosure Review Board (DRB) standards and has been assigned DRB approval number CBDRB-FY19-371 (approved 2019-06-03).

Relational structure



- ▶ One roster table and five event-specific tables can be linked in two ways
 - ▶ `cjars_id` to pool all events for one individual
 - ▶ Event identifiers (`arr_id`, `adj_id`, etc.) to follow an individual criminal episode through the justice system

Data schema

- ▶ National data schema (table structure, variables, code schemes) balances
 - ▶ Complexity to support nuanced research questions
 - ▶ Consistency across jurisdictions to reduce barriers to working with data
- ▶ Finite project resources limit level of detail we can extract from source files
- ▶ Where possible, we preserve source values (e.g. offense descriptions, sentencing fields) in addition to harmonized variables to support customization

Federal Statistical Research Data Centers

- ▶ CJARS microdata is **currently** available for external request to qualified researchers on approved projects
- ▶ 33 secure Census Bureau facilities housed in partner institutions
- ▶ Access costs vary by location, affiliation, and project duration; no CJARS costs
- ▶ Researchers can bring data to link
- ▶ Expanding virtual access
- ▶ Only aggregate statistical material, reviewed by the Census Bureau Disclosure Review Board, can be released from FSRDCs



Requesting access to CJARS through the FSRDCs

- ▶ FSRDC proposals require
 - ▶ Project overview and description of research methods
 - ▶ Requested data and linkage procedures
 - ▶ Planned statistical output
 - ▶ Statement of benefits of the project for the Census Bureau
- ▶ CJARS team has a proposal guide to facilitate successful proposals
- ▶ Apply through the Standard Application Process (SAP) portal
- ▶ Additional review by CJARS data providers depends on
 - ▶ Jurisdictions being studied
 - ▶ Level of geographic aggregation

Researchers can link amazing data

- ▶ Anonymized data can be linked at person-, address-, and employer-levels
- ▶ Survey data
 - ▶ Decennial censuses, American Community Survey, Current Population Survey–Annual Social and Economic Supplement, Survey of Income and Program Participation
- ▶ Administrative records
 - ▶ Longitudinal Employer-Household Dynamics (LEHD) quarterly earnings data
 - ▶ Public program data: Medicaid and Medicare enrollment, Social Security programs, HUD assistance, SNAP, TANF, WIC

New access mechanism at University of Michigan

- ▶ For projects that don't require Census Bureau data, CJARS team at the University of Michigan is developing a separate non-federal data access mechanism
- ▶ Researchers will be able to
 - ▶ Propose projects to the CJARS team at UM
 - ▶ Pay to access CJARS data on secure server at UM
 - ▶ Bring their own data to link

More information about CJARS

- ▶ Website at UM: <https://cjars.org>
- ▶ Website at Census Bureau: <https://census.gov/cjars>
- ▶ Data documentation:
<https://cjars.org/data-documentation-download>
- ▶ Proposal development guide:
<https://cjars.org/proposal-guide-download>
- ▶ Standard Application Process (SAP) Portal for FSRDC proposals:
<https://www.researchdatagov.org>

Thank you

Keith Finlay

keith.ferguson.finlay@census.gov

301-763-6056

Analysis of Alternative Poverty Measures Applied to the Case of Montana

Robin Clausen, Ph.D.

Stakeholder Liaison and Research Analyst
(Statewide Longitudinal Data System),
Montana Office of Public Instruction



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Trachtenberg School
of Public Policy
& Public Administration
THE GEORGE WASHINGTON UNIVERSITY

Analysis of Alternative Poverty Measures Applied to the Case of Montana

Robin Clausen, PhD

Research Liaison, Statewide Longitudinal Data System

Montana Office of Public Instruction

The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R372A200011 to the Montana Office of Public Instruction. The opinions expressed are those of the author and do not represent views of the Institute or the U.S. Department of Education.



School Level Poverty Measure Study - Montana

This research has three parts. It addresses the suitability, sensitivity, and consistency of alternative poverty measures using Montana's Statewide Longitudinal Data System resources.

- **State level** between eight poverty measures, 16 student and institutional outcome variables.
- **Locale level** between six poverty measures, 12 student outcome variables.
- **Proximity to school by locale** – two poverty measures, eight student outcome variables.

This presentation focuses on state trends.



Emerging Insufficiencies of NSLP Eligibility Data

Participation in the National School Lunch Program (NSLP) has become decoupled from income and poverty.

- Data can be incomplete since income data is only collected one time and family income can vary over a year.
- Data can be inconsistent in that it differs from participation rates.
- Data can overidentify poor students since family income is benchmarked at 130% of the poverty level.
- Data can have inaccurate accounting of students in Community Eligibility Provision districts.
- Data faced many constraints due to pandemic expansion of school meals programs.



Assessing Alternatives

How sensitive and consistent are the alternative measure is to past and future trends? Our study draws from the methodology of a RAND study (Doan, Diliberti, & Grant, 2022) that focuses on alternative poverty measures (American Community Survey data). Our research questions include:

- Are there difference in how alternative poverty measures are **correlated** with NSLP and the degree to which they are **classified** in the same quartile?
- How much variation in the dependent variables (student outcome and institutional) is **explained** by each measure of school poverty?
- Do different school poverty measures create estimates in the same **direction, significance, and magnitude**?



Assessing Relationships

All Schools

	Correlation	Count	Lower C.I.	Upper C.I.
CEP Direct Certification	0.562	673	0.508	0.611
Eligibility	1.000	673	--	--
Participation	0.926	653	0.914	0.936
Longevity	0.855	298	0.822	0.883
SAIPE	0.592	671	0.541	0.639
School Address	-0.623	671	-0.667	-0.574
SNP Estimate	-0.621	643	-0.667	-0.571
Student Address	-0.682	599	-0.723	-0.637



Correlations (Most Impoverished)

	Correlation	Count	Lower C.I.	Upper C.I.
CEP Direct Certification	0.869	127	0.819	0.906
Eligibility	1.000	168	--	--
Participation	0.450	166	0.320	0.564
Longevity	0.482	89	0.304	0.627
SAIPE	0.367	167	0.228	0.491
School Address	-0.380	167	-0.503	-0.242
SNP Estimate	-0.357	165	-0.484	-0.216
Student Addresses	-0.491	155	-0.602	-0.361

Eligibility
Quartile 4

Classification: Less Economic Disadvantage

School Poverty Measure	Total Schools	Missing	Count	Count Exact Match	Percent Exact Match	Count Within One Quartile	Percent Within One Quartile
Quartile 1							
CEP Direct Certification	--	--	--	--	--	--	--
Participation	169	1	168	150	89.29%	168	100.00%
Longevity	44	0	44	34	77.27%	41	93.18%
SAIPE	169	4	165	91	55.15%	132	80.00%
SNP Estimate	169	5	164	91	55.49%	142	86.59%
Student Address SIDE	152	0	152	89	58.55%	131	86.18%
School Address SIDE	169	1	168	86	51.19%	142	84.52%



Variance Explained by Poverty Measure

	Eligibility	Participation	SAIPE	School Address SIDE	School SNP	Direct Certification	Longevity	Student Address SIDE	All Poverty Indicators
Satisfactory Attendance Rate	0.082	0.111	0.029	0.056	0.067	0.208	0.113	0.059	0.274
Suspension/Expulsion Rate	0.147	0.136	0.346	0.153	0.165	0.057	0.008	0.154	0.900
ELEM SBAC ELA Proficiency	0.358	0.307	0.059	0.097	0.166	0.318	0.143	0.083	0.588
ELEM SBAC Math Proficiency	0.348	0.295	0.066	0.107	0.179	0.309	0.150	0.104	0.441
HS ACT Composite	0.330	0.261	0.143	0.251	0.265	0.445		0.281	--
ELEM SBAC Interim ELA	0.145	0.121	0.072	0.08	0.096	0.199	0.187	0.062	0.608
ELEM SBAC Interim Math	0.257	0.235	0.07	0.146	0.17	0.151	0.175	0.131	0.615
						Meet or Exceed NSLP			

Sensitivity of Estimated Association of School Poverty Measures and Outcome/Financial Measures to Attendance Rate									
	Naive	Eligibility	Participation	SAIPE	School Address SIDE	School SNP	Direct Certification	Longevity	Student Address SIDE
HS Dropout Rate	-3.54 * (1.643)	-1.692 (2.006)	-1.766 (1.852)	-2.364 (1.703)	-3.202 (1.742)	-2.958 (1.748)	-2.683 (1.887)	-- --	-2.486 (2.129)
EWS Dropout Probability	0.899** (0.283)	-0.559 (0.318)	-0.676* (0.312)	-0.603* (0.300)	-0.825** (0.296)	-0.813* (0.299)	-0.010 (0.804)	-1.200 * (0.590)	-0.572 (0.347)
HS Graduation Rate	0.012*** (0.003)	0.009* (0.004)	0.008* (0.004)	0.011*** (0.003)	0.011*** (0.003)	0.011 (0.003)	0.002 (0.004)	-- --	0.012** (0.004)
Post Secondary Enrollment	0.624*** (0.185)	0.487* (0.212)	.428* (0.204)	0.583** (0.186)	0.590** (0.190)	0.571** (.189)	1.302 (0.651)	-- --	0.511* (0.201)

Conclusions

- Eligibility consistently explains variation in student outcome measures to a greater degree than alternative poverty measures.
- Sensitivity and consistency is dependent on context. Poverty measures have different results when compared to others. At the state level, results are mixed pointing to the need for a nuanced look at the construction of each measure.
- Companion studies found variation by locale and the suitability of the SIDE measures due to consistency across locales.



Thank you for your interest!

Please address questions/comments to:

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Montana Office of Public Instruction

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406-444-3793

<https://gems.opi.mt.gov>





From Evidence Generation to Better Decisions: MCC's Evidence Lifecycle

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From Evidence Generation to Better Decisions: MCC's Evidence Lifecycle

2023 Research Symposium | 24 May 2023



MILLENNIUM
CHALLENGE CORPORATION
UNITED STATES OF AMERICA

MCC: Who We Are

Mission: Reduce Poverty through Economic Growth

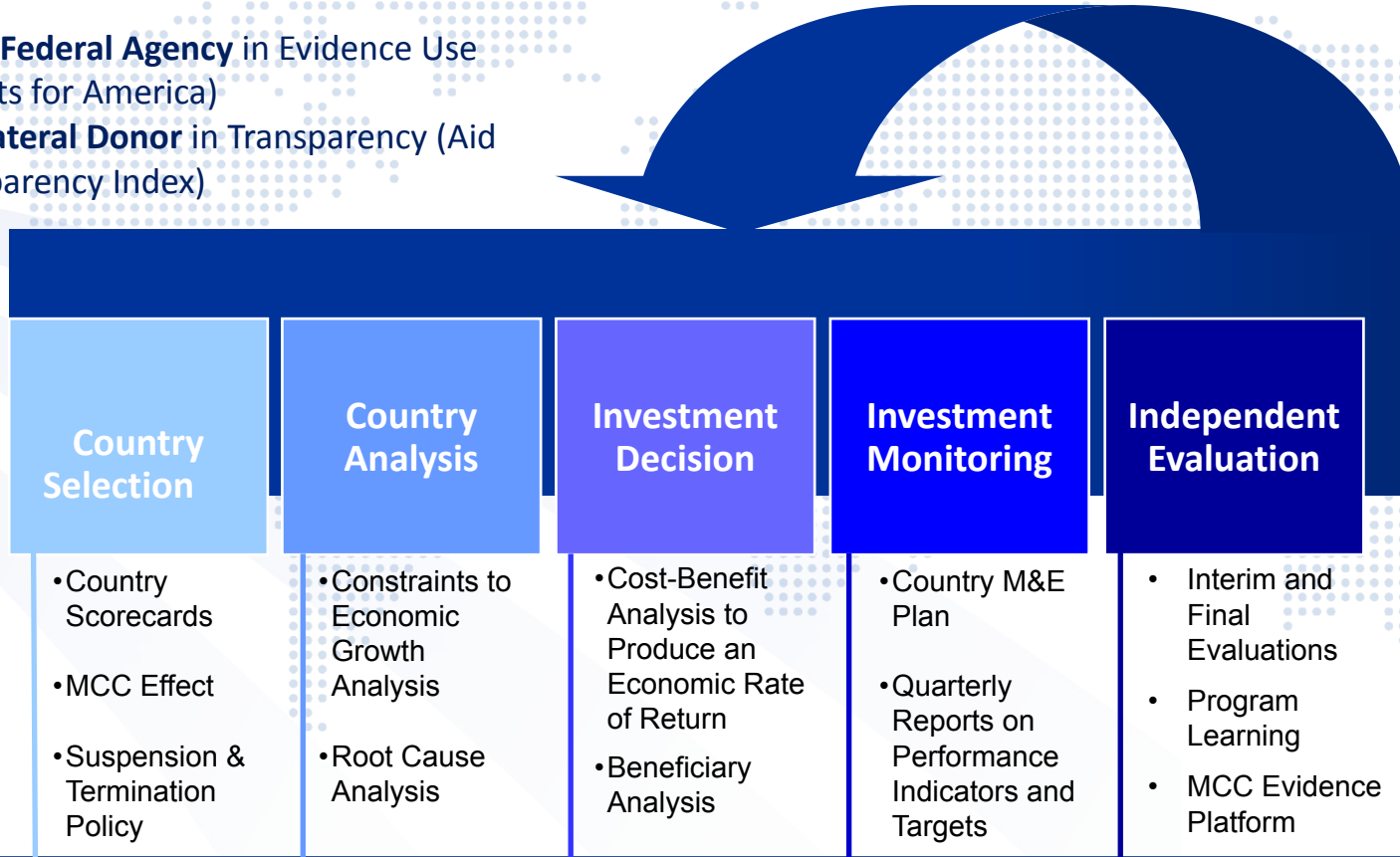
MCC Model:

- Applies selectivity to country partners and project choices
- Promotes country ownership
- Focuses on results



MCC's Evidence-Based Approach

- **#1 US Federal Agency** in Evidence Use (Results for America)
- **#1 Bilateral Donor** in Transparency (Aid Transparency Index)



Today's Agenda:

- MCC Evidence Platform Demo
- Panel on MCC Evidence Lifecycle
 - Production □ Publication □ Dissemination □ Use □ Decision-making
- Audience Q&A



Panel Discussion



Algerlynn Gill

Senior Director,
Monitoring and
Evaluation, MCC



**Hana
Freymiller**

Senior Advisor,
Monitoring and
Evaluation, MCC



Sarah Lane

Director,
Monitoring and
Evaluation, MCC

MODERATOR



**Casey
Dunning**

Director,
Results &
Learning, MCC

Panel Discussion

Questions? Feedback?
Email evidence@mcc.gov

Visit the MCC Evidence Platform at
<https://evidence.mcc.gov>

Webinar

INNOVATIONS IN GOVERNMENT POLICYMAKING

Wednesday, June 7, 2023, 11:00 AM - 12:00 PM ET

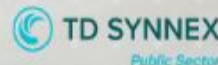


Webinar

IMPROVING THE GOVERNMENT EXPERIENCE:

Building Trust with the Public Sector's
Customers with Better Services

Thursday, June 15, 2023, 1:00 PM - 2:00 PM ET





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