



Lessons Learned: Effective Data Visualization to Inform Policy

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Background

Goal: Promote consistency in overdose-related outcome data and demonstrate the need for increased availability of state-level data

Background

- The American Medical Association (AMA) released an [interactive overdose data dashboard](#), which compiles state-level data for several indicators, including overdose mortality, non-fatal overdoses, opioid prescriptions, and PDMP queries.
- The tool highlights data gaps, through a visual that shows which states are missing data for any of the indicators.

Methodology

- Qualitative study to understand the usability and potential impact of AMA overdose data dashboard
- Conducted 19 interviews with key stakeholders over Zoom
- Analysis of the interviews with collaborators at NORC

Methodology

- List of Organizations Interviewed

- *Government Agencies:*

- Centers for Disease Control (Injury Center, Office of Communication)
- Centers for Disease Control (Epidemiology and Surveillance Branch, Division of Overdose Prevention)
- National Institutes of Health (NIH)
- Washington/Baltimore High Intensity Drug Trafficking Area (HIDTA)

- *Academic / Research Organizations:*

- Brandeis University
- Eastern Tennessee State University (ETSU) Addiction Science Center
- Johns Hopkins University
- RAND Corporation
- University of Colorado
- University of North Carolina

- *Non-Profit/Membership*

- *Organizations:*

- Council of State and Territorial Epidemiologists (CSTE)
- Massachusetts Medical Society
- Pew Charitable Trusts
- Trust for America's Health (TFAH)

- *States:*

- Arkansas
- Maryland
- Missouri
- New Jersey
- Pennsylvania

Dashboard feedback

- **Strengths**

- Dashboard provides “one-stop shop”
- Fills a gap in allowing users to compare between states and providing a national snapshot
- Dashboard and graphics are visually appealing

- **Challenges**

- Difficulty ascertaining the focus of the dashboard
- Some visualizations were difficult to understand
- Discrepancy in the overall narrative of the dashboard
 - Top half of the dashboard → Policy narrative
 - Bottom half of the dashboard → Information resource

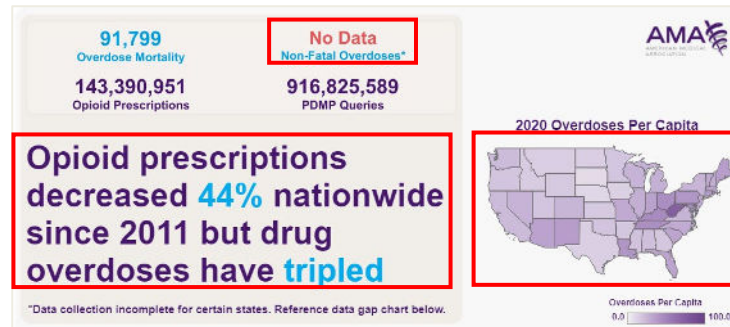
Dashboard feedback

- Formatting Feedback
 - Increase font size, especially in the State Snapshot and Demographics sections
 - Colors are too similar in some visualizations (Comparison of Prescribing, Treatment; Overdoses by Drug Class; Demographics)
- Functionality Suggestions
 - An extra layer that has “pop-ups” with instructions, as well as ones that allow users to click/hover over features to see more information
 - Ability to download raw data
 - A report builder, that allows users to select certain metrics or states, with an accompanying download feature
 - An interface that allows users to generate and copy sentences or statistics

Dashboard feedback: Who is the audience?

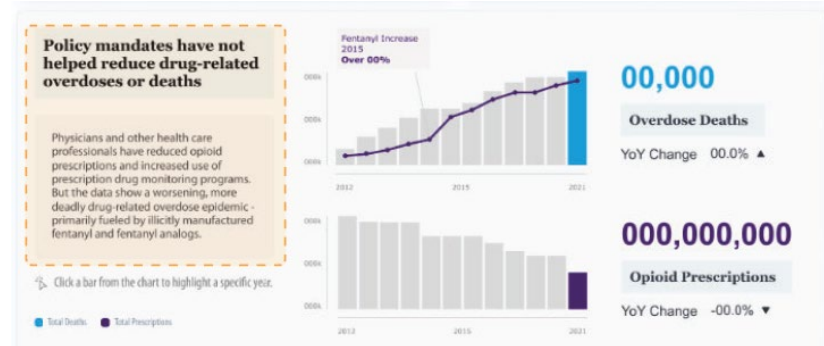
- Intended audience was unclear to majority of interviewees
- Identifying audience is crucial to the informing overall approach and message of the dashboard
- Potential audiences:
 - Physicians and clinicians; prescribers; AMA membership
 - Policymakers
 - Public population / general audience / media
 - State or local health departments
 - Grant writers
 - Academia and research institutions
 - Behavioral health professionals
 - Treatment and recovery community
 - Law enforcement
 - Non-profits

Dashboard feedback: Introduction Section



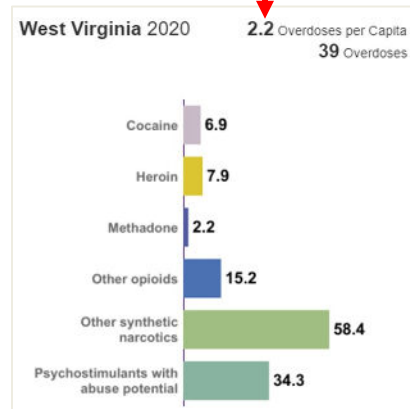
- Technical
 - Move the headline statement to the beginning of the dashboard/section
 - Don't begin the dashboard with no data
 - Confusion on what selecting a state on the map does to the section/dashboard
- Content (Headline Statement)
 - Appreciated a statement/narrative building
 - Unsure what to take away from the statement / its intended message
 - Statement may be misleading (i.e., blanket wording, does not parse out illicit substances)
 - May be interpreted as a political stance or message
 - May be too complicated for those who are less familiar with the data

Updated Version: Let the data speak



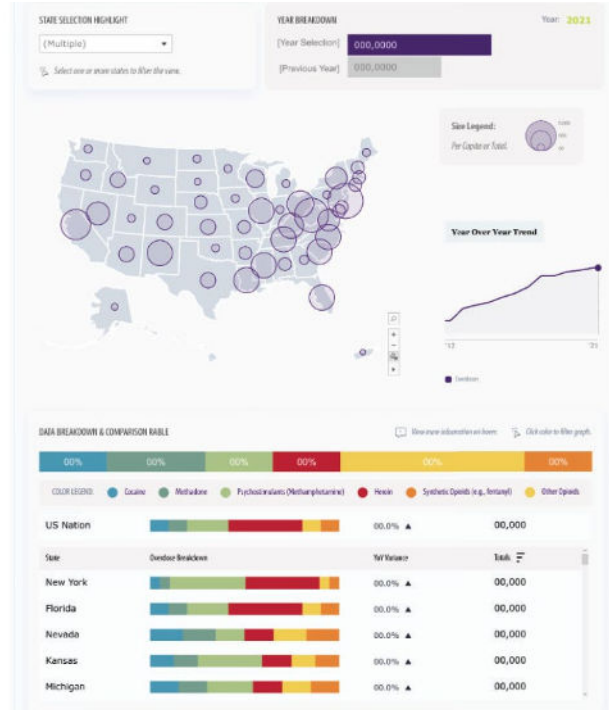
Dashboard feedback: Balancing Visuals for Impact

- Feedback
 - Useful section (allows users to toggle between three indicators and between per capita/total)
 - Shows that the crisis does not look the same in every state
 - Circles are a “neat” visualization
 - Not all interviewees realized they could hover to see bar graph, but thought this was helpful
 - Difficulty digesting the section (i.e., number of shapes, information, busyness)
 - Unsure how to interpret some of the data (i.e., size of the radius/rings)
 - Size of circles do not always seem to align with the bar chart
 - Legend does not align with the bar chart that pops up (text and order)



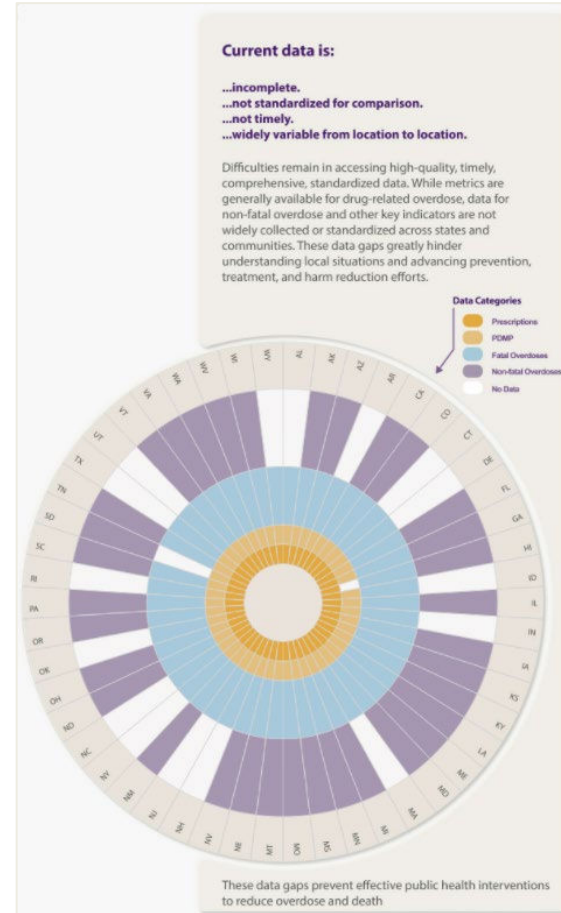
Updated Version: Making Data Accessible

- Allows for Comparisons between states and the U.S.
- Allows for use on mobile devices



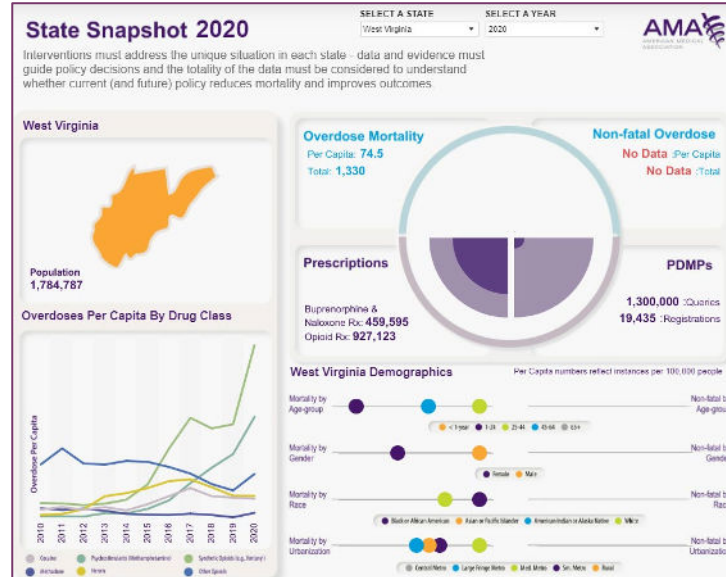
Dashboard feedback: Data Gaps

- Helpful to visualize data availability and identify data gaps across states
- Challenges
 - Difficult to interpret the graphic and legend when looking at individual states
 - Too prominent on the dashboard
 - Should not be combined with the Comparison of Prescribing, Treatment and Overdose Metrics section
- Suggestions
 - Include explanation as to why there are gaps in data
 - Ability to click on the different colors to show more data and information



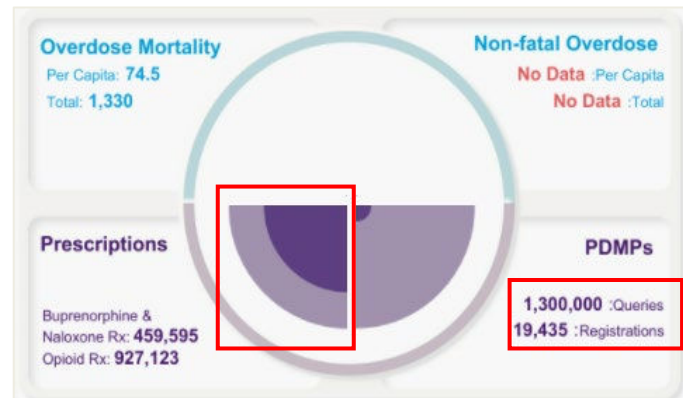
Dashboard feedback: State Snapshot

- Identified as the most useful section within the dashboard
 - Appreciated convenience of having state-level data compiled in one dashboard and inclusion of PDMP data
- Suggestions
 - Add a comparison feature to compare states to each other or to the US as a whole
 - Move section to the top of the dashboard, to be more prominent



Dashboard feedback: Pie Chart

- Difficulty interpreting this visualization
 - Lack of text explanation
 - Lack of legend to complement the visual
- Prominence of “No Data”
 - Unclear that earlier years may have data when No Data appears
- Specific components that interviewees struggled with:
 - Size and shading of “pie” pieces
 - What “queries” and “registrations” meant




Updated Version: Using Common Charts

State Snapshot

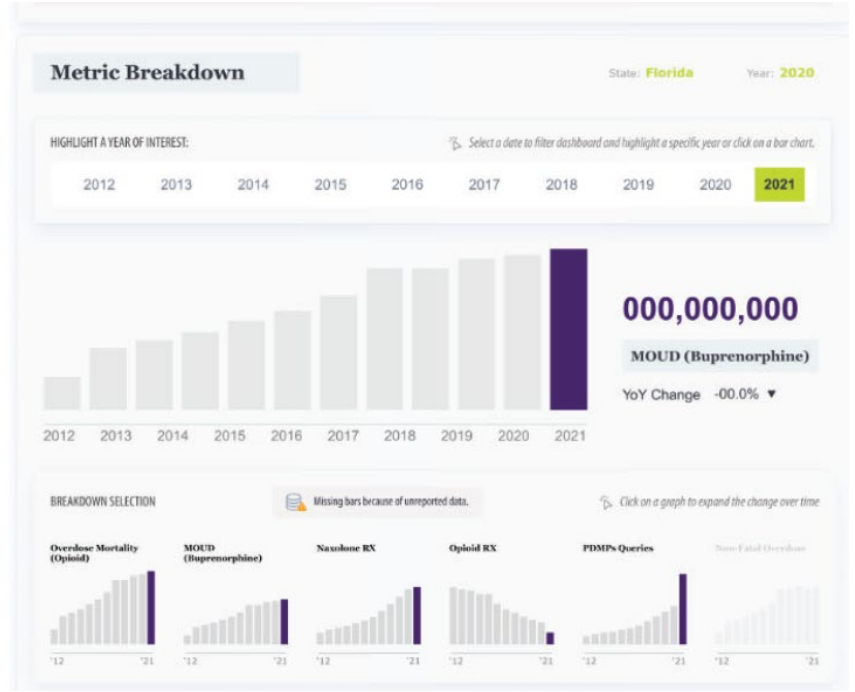
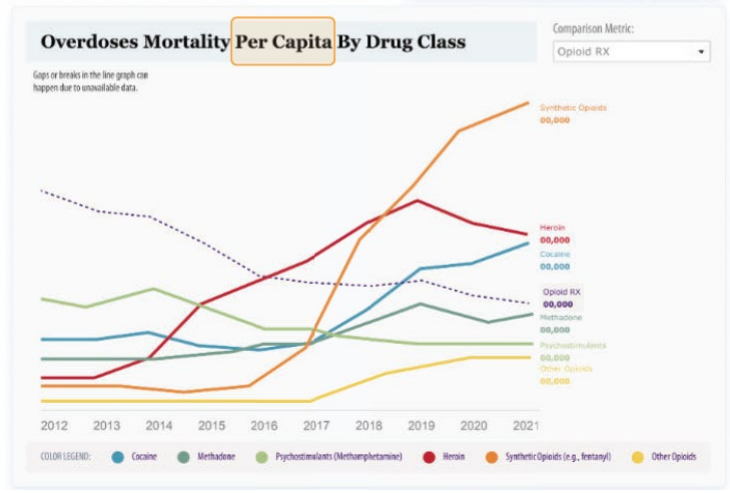
Make a state selection using the drop-downs or the area map to filter to a single state.

State Selection:

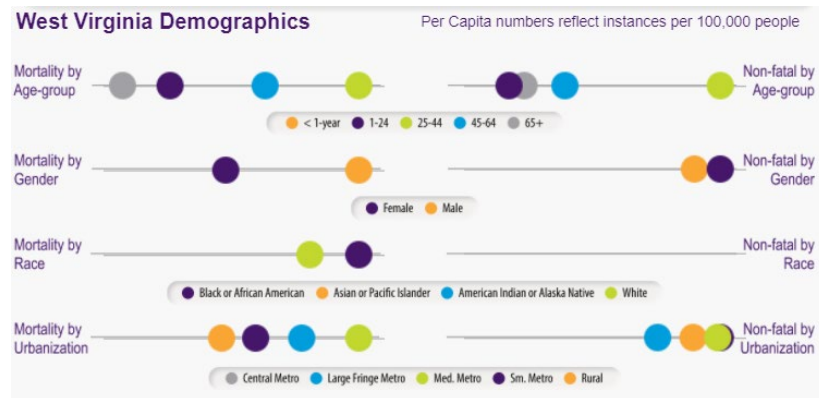


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Some states can report additional data sets. [Explore Dataset](#)

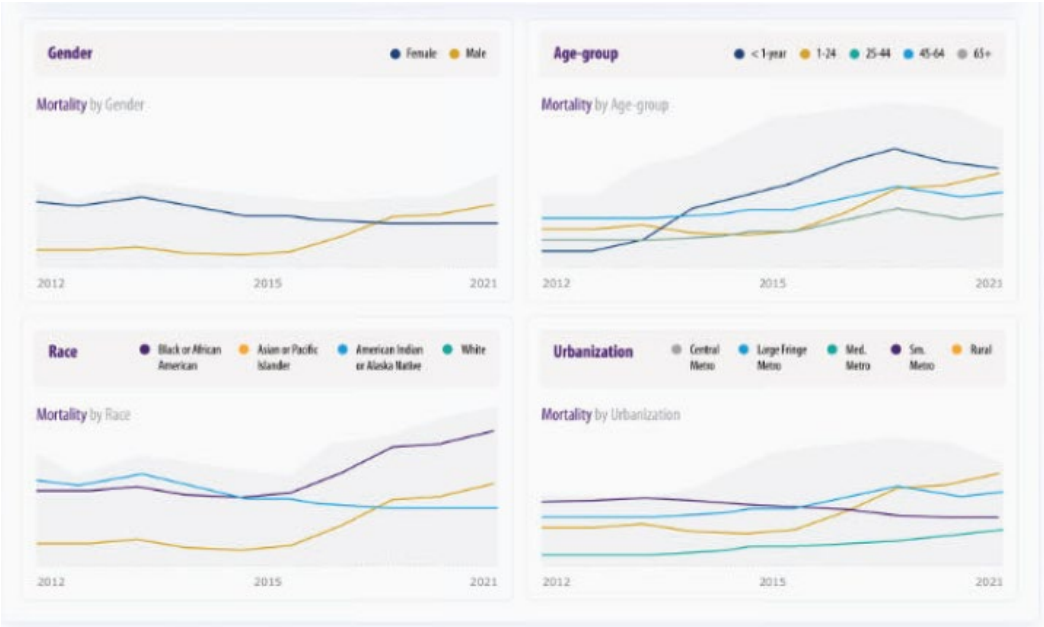


Dashboard feedback: Demographics



- Interviewees appreciated the inclusion of demographic data
- Challenges
 - Legends are difficult to interpret (i.e., spacing, font size color, overlapping)
 - Non-fatal overdose data is missing for recent years
 - Is data ever available for non-fatal by race?
 - Unclear x-axis
- Suggestions
 - Redefine age groups (i.e., change 1-24 to 18-24, remove <1 year)
 - Provide information on how to interpret the visuals/data

Updated Version: Longitudinal Data



Dashboard feedback: Health Equity

- Demographics section serves as a “conversation starter” for health equity, but does not tell the full story
- More information and data are needed to further evaluate health equity
- Suggestions
 - Inclusion of SDOH data by AMA would have an immense impact. Some examples:
 - Disability status
 - Distance to work
 - Employment
 - Engagement in care
 - Include time series visual for the current indicators by demographic groups, to evaluate health equity over time

Potential dashboard enhancements

- Interviewees largely expressed interest in linking to state dashboards
 - Useful supplemental resource
 - Potential opportunity to partner with states
- Avenues for incorporating:
 - State Snapshot section
 - References section
- Some limitations may include:
 - Not all states have dashboards and/or comparable data
 - Challenges identifying and maintaining list of state dashboards
 - May add “noise” to dashboard (i.e., how much information is too much information?)
 - Data is a moving target and concerned that media / other users may ask why state dashboard data are different from AMA data

Potential dashboard enhancements

- Changes over time/time series data
- Methadone / Methadone Clinics
- Criminal justice/law enforcement indicators (i.e., seizure data)
- Percentages by population of doctors available to prescribe MAT
- Number of doctors that prescribe buprenorphine (OTP sites)
- NAS indicators
- HIV transmission
- More non-fatal measures (i.e., ED, 911 calls)
- Treatment retention and engagement
- County level data
- Coverage and availability of medications for OUD
- Drug trafficking and illicit substances measures
- Harm reduction indicators
- Stimulant prescribing / benzos and stimulants
- Peer recovery specialists and where they are to show voids/gaps
- Elevated information on demographics
- Prescribing demographics
- More PDMP indicators
- Multiple substances and their type at time of death
- Reporting / underreporting from coroners / medical examiners

Standardization of overdose surveillance data

- Challenges
 - Lack of consistency in data indicators across states
 - Complexity of nonfatal overdose data
 - EMS data can be complex
 - Difficult to determine the number of nonfatal overdoses that are not witnessed by law enforcement or EMS
 - Lack of timely data, often a limitation of overdose surveillance data

Standardization of overdose surveillance data

- Indicators Lacking Consistency

Indicator	Challenges
Fatal Overdoses	Problems with coroners / medical examiners (“patchwork” system)
Nonfatal Overdoses	Many cases are lost to follow-up (i.e., revived in the field and refuse transport)
Naloxone Distribution	A lot of naloxone comes from harm reduction or individual purchases; Naloxone is so prevalent at this point that it may “not [be] a good indicator of anything”
PDMP Data	PDMPs vary considerably by state
Neonatal Abstinence Syndrome	Standardization around NAS isn’t being adopted as quickly; Some concerns about reporting NAS if it carries a criminal penalty
Law Enforcement Data	Some states are easier than others to get law enforcement data; Inconsistent
Race / Ethnicity Data	Often missing race data makes it difficult to assess health equity

Standardization of Overdose surveillance data

Recommendations on AMA's role related to standardization efforts included:

- Advocating for timely reporting of overdose data at the state level
- Helping to set standards, along with public health organizations such as CDC and CSTE, and provide best practices for standardization of overdose outcomes, with a focus on nonfatal overdoses
- Convening individuals who build dashboards to share best practices through work groups or conferences

Lessons Learned

- Include background information or an introduction to the dashboard that discusses the intended audience and goals of the dashboard.
- Develop a Users' Guide or page on the dashboard that describes how to use the tool.
- Add additional headline statements to indicate the purpose of data included in that section and any critical messages.
- Provide more information on how to interpret graphs.
- Make the demographics section more readable and understandable.
- Review readability, font size, and color throughout the dashboard.

Dashboard: [End the Epidemic \(end-overdose-epidemic.org\)](https://end-overdose-epidemic.org)

Acknowledgments

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Physicians' powerful ally in patient care