

CTN-0135: Development & Use of an Interactive, Web-based Platform to Share Scientific Findings



CPDD Symposium – How to Communicate Our Science to the Public/Laypersons

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Disclosures

None



Presentation Objectives

1. Provide a brief summary of the CTN-0135 study
2. Describe the development of an interactive data dashboard as a dissemination tool
3. Review the methods and results of an evaluation of the data dashboard
4. Share the final version of the data dashboard



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CTN-0135 Aim 2 Brief Overview



Background – Why is Fentanyl Problematic

- Fentanyl is highly lipophilic and has a variable clearance rate (Suzuki & El-Haddad 2017; Huhn et al. 2020); little is known about illicitly manufactured fentanyl + analogs
- Problems initiating buprenorphine treatment among patients using fentanyl has been largely described as precipitated opioid withdrawal (POW)
- However, studies in emergency departments have reported extremely low (0.76%) prevalence of POW (D’Onofrio et al 2023; D’Onofrio et al. 2026)
- Fentanyl has a secondary peaking phenomenon (“fentanyl rebound”)
- Fentanyl-exposed individuals have more severe opioid withdrawal compared to non-fentanyl/opioid exposed
 - Non-fentanyl/opioid exposed had linear decline in opioid withdrawal
 - Fentanyl-exposed had a decline on day 1, with rebound days 2-3 (Sharma et al. 2024)



CTN-0135 Study

- Aim 2: Estimate the national prevalence of clinician-reported problems initiating buprenorphine treatment in patients using fentanyl and summarize how these problems are changing clinical practices.
- Methods: Developed & administer a web-based survey which was distributed to a random sample of clinicians (n=396) waived to prescribe buprenorphine for OUD, the survey was open June 2, 2023- March 18, 2024
- **We explicitly requested permission to recontact respondents**



Original Investigation | Substance Use and Addiction

Barriers to Buprenorphine Initiation in Patients Using Fentanyl

Sarah S. Kawasaki, MD; Jane M. Liebschutz, MD, MPH; Cristina Murray-Krezan, PhD; Galen E. Switzer, PhD; Samantha Nash, BS; Kwonho Jeong, MS; Erin L. Winstanley, PhD



Why Create A Data Dashboard

- CTN-0135 Aim 2 survey respondents represented 48 jurisdictions/states
- There was geographic variation in the results, which was difficult to capture in a static figure
- We wanted to explore other dissemination strategies, besides publishing in peer-reviewed journals, to share the results with a broader audience
- We received positive feedback on a very early draft of the data dashboard from the Community Advisory Board (CAB) of the Appalachian Node of the NIDA CTN → they immediately commented on the potential clinical value



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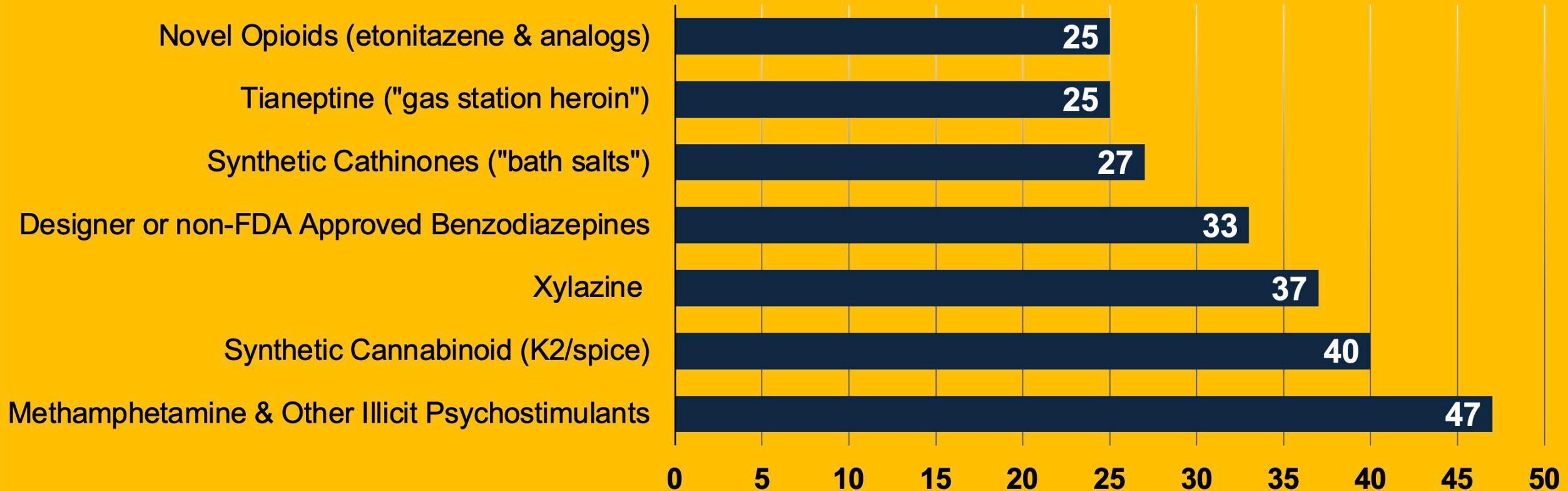
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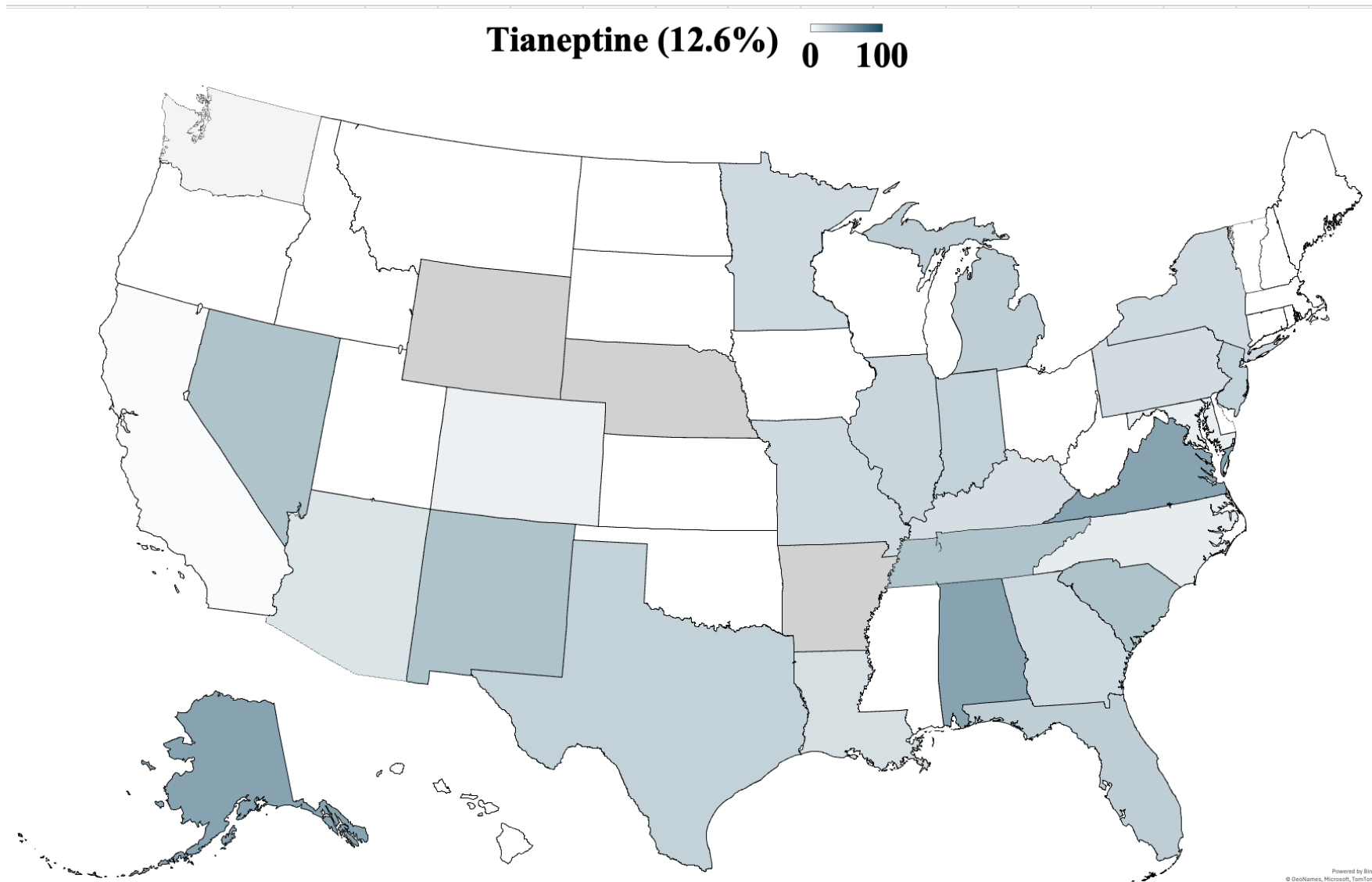
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Example of Static Data for a Presentation

Number of States with Clinicians Reporting Drugs Complicating Treatment



Example of Static Data for a Publication



Dashboard Development & Testing



Data Dashboard Development

- Shiny App was used as a platform
- Story-boarded the initial key results & potential figures
- Presented early draft to CAB
- Iteratively reviewed & revised as a group
- Very small pilot test with a convenience sample

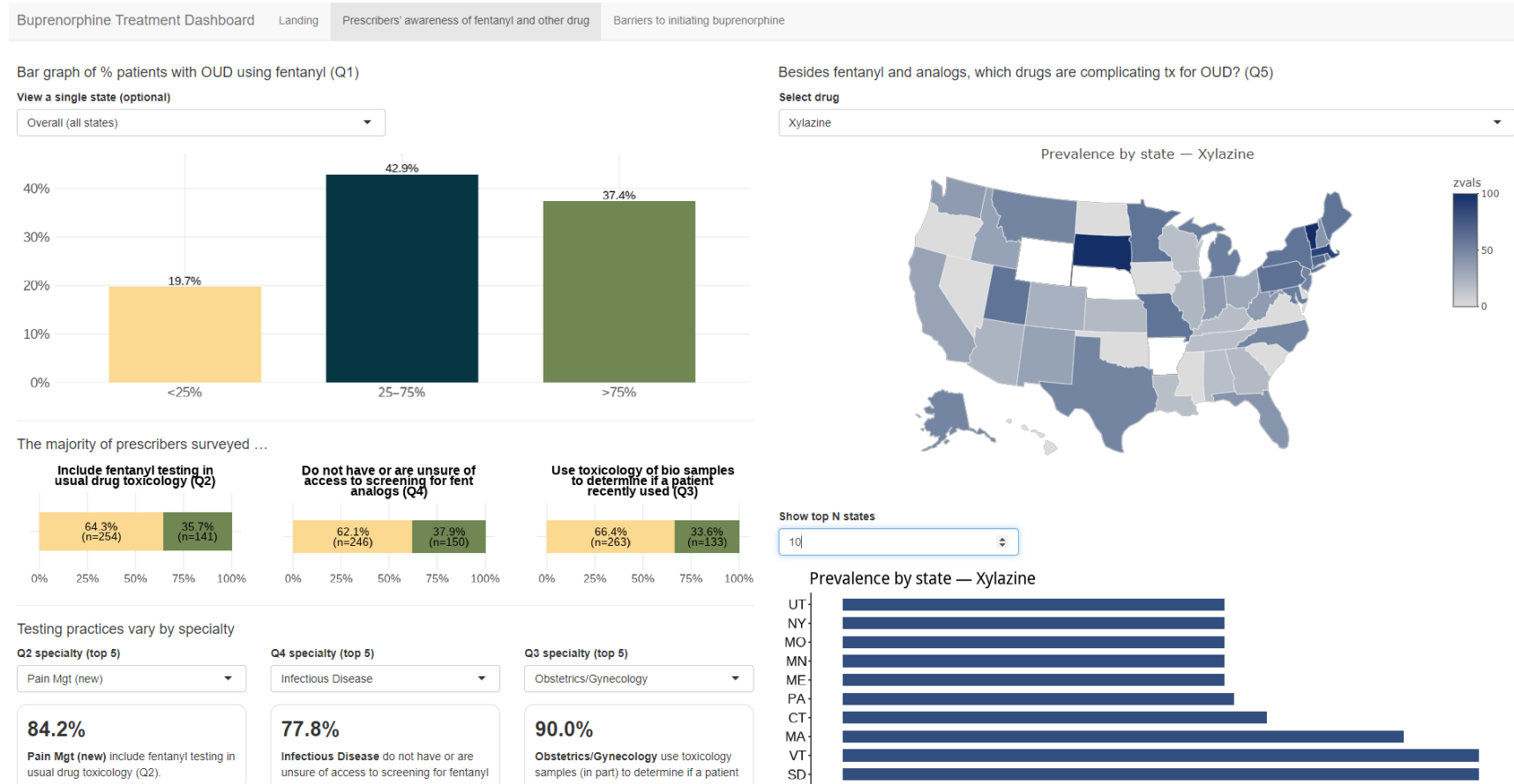


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The screenshot shows the Shiny website homepage. At the top left is the 'Shiny' logo. At the top right is a navigation menu with links: 'Home', 'Get Started', 'Shiny for R', 'Shiny for Python', 'Blog', and a search icon. The main heading reads 'Easy web apps for data science without the compromises'. Below this, it states 'No web development skills required'. There are two buttons: 'Get started in R' and 'Get started in Python'. A large blue bar chart is displayed below the buttons. At the bottom, a light gray box contains the text: 'Here is a Shiny app' followed by 'Shiny apps are easy to write. Let users interact with your data and your analysis, all with R or Python:'.

Dashboard Development – Early Phase

- Early drafts were complex, with a lot of information on one page



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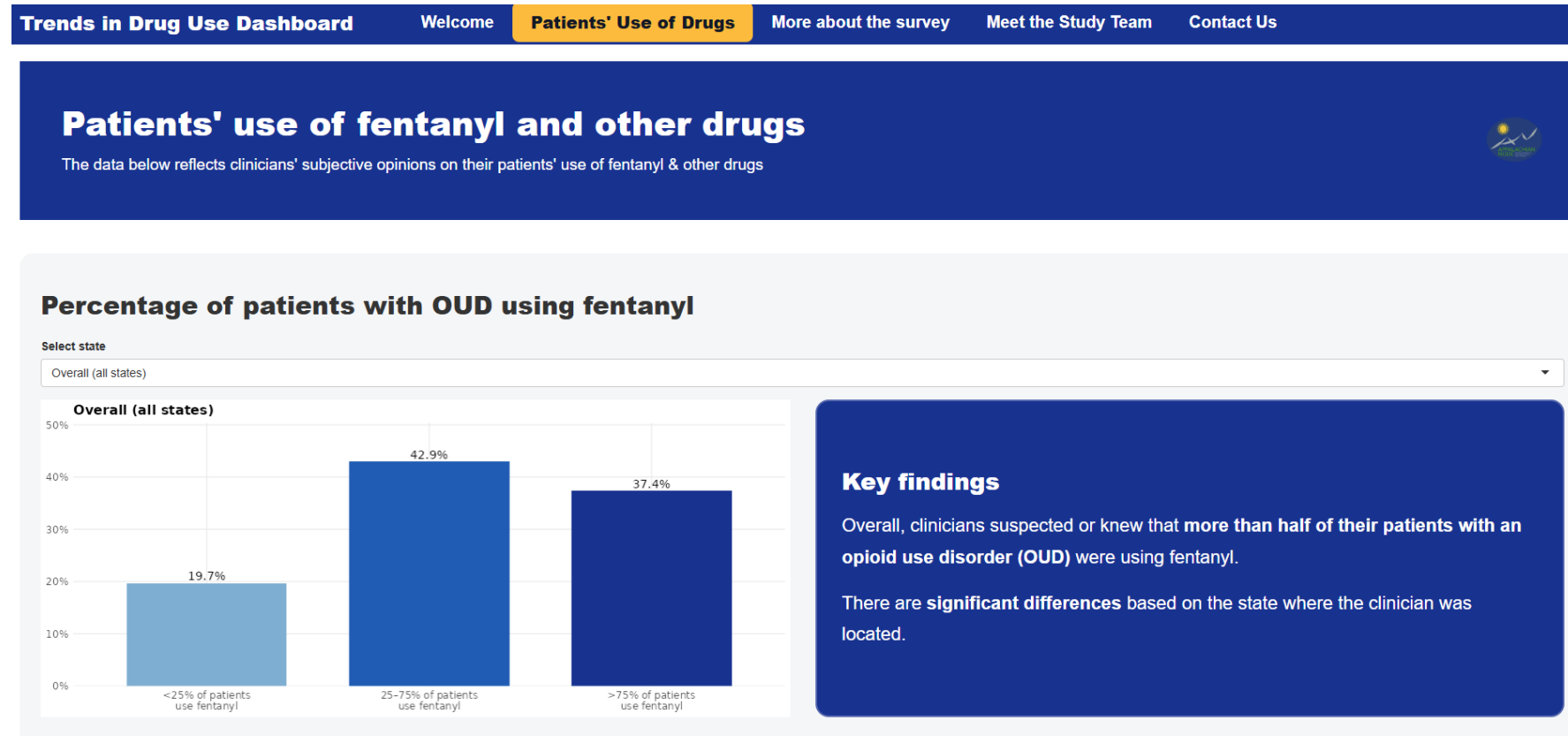
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Dashboard Development - Refinement

- Final layouts featured 1-2 graphs on screen at a time
- Included “key findings” boxes that described the results



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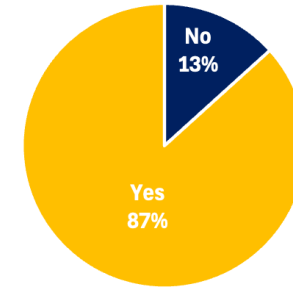
Dashboard Evaluation Survey

- System Usability Scale (SUS) to determine dashboard usability (Brooke, 1995)
- Sample consisted of CTN-0135 Aim 2 survey respondents that had “opted-in” for future contact (n=364)
 - Those who did not provide an email address (n=13), had an incorrect email addresses (n=7), or those who opted out (n=1), were excluded, leaving the final contact sample size of N=343
 - Scores of individuals who did not answer all the SUS questions were excluded from the total SUS Score
- A short 15-minute survey was created and distributed via REDCap automated messaging to send every 2 days for up to 7 days.
 - Elements included: SUS questions, generalize usability questions, basic demographics, and some open-ended questions
- The survey was open from April 8-22, 2026 (N=106), 31% response rate

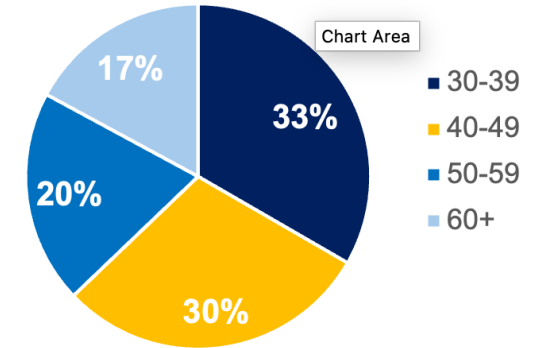
Survey Results

- 84.4% were at least somewhat satisfied with the dashboard
- 91.7% found study results relevant to clinical practice
- 77.7% said they would be likely to use a data dashboard to learn about study results

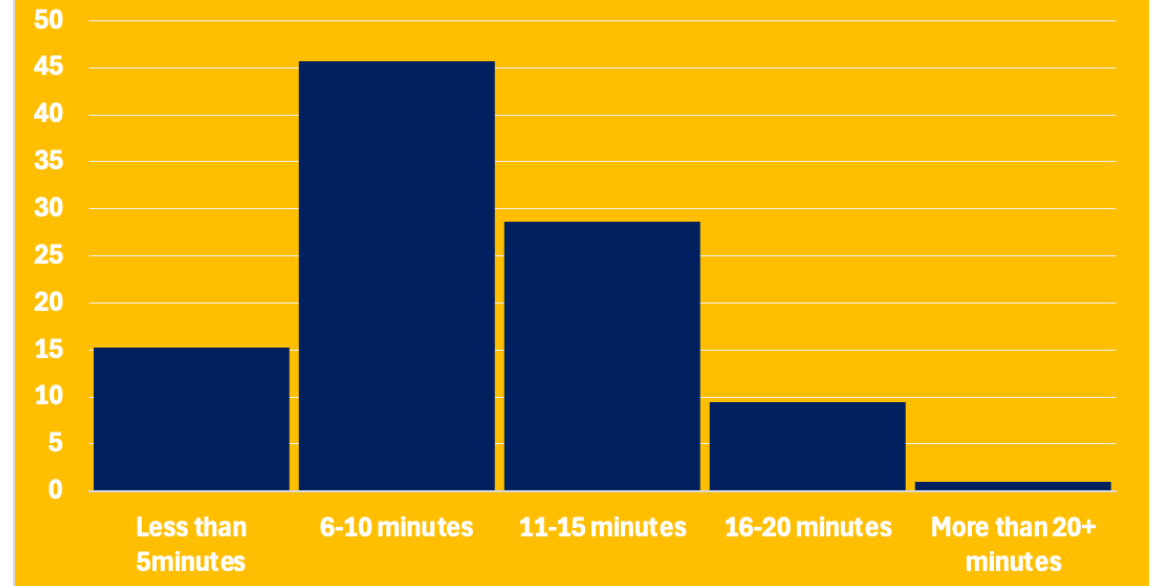
Would you share this data dashboard with a patient or colleague?



Age Range



Time Spent on Dashboard



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Open-Ended Survey Responses

- Strengths: “simplicity and ease of use”, “I liked the maps and charts in close proximity to narrative points”
- Opportunities for improvement: “color scheme, scrolling reduction, font sizes”
 - Links to evidence-based strategies to mitigate adverse events
 - Suggestions on future data regarding novel/OTC opioids and buprenorphine
 - Some wanted patient level data

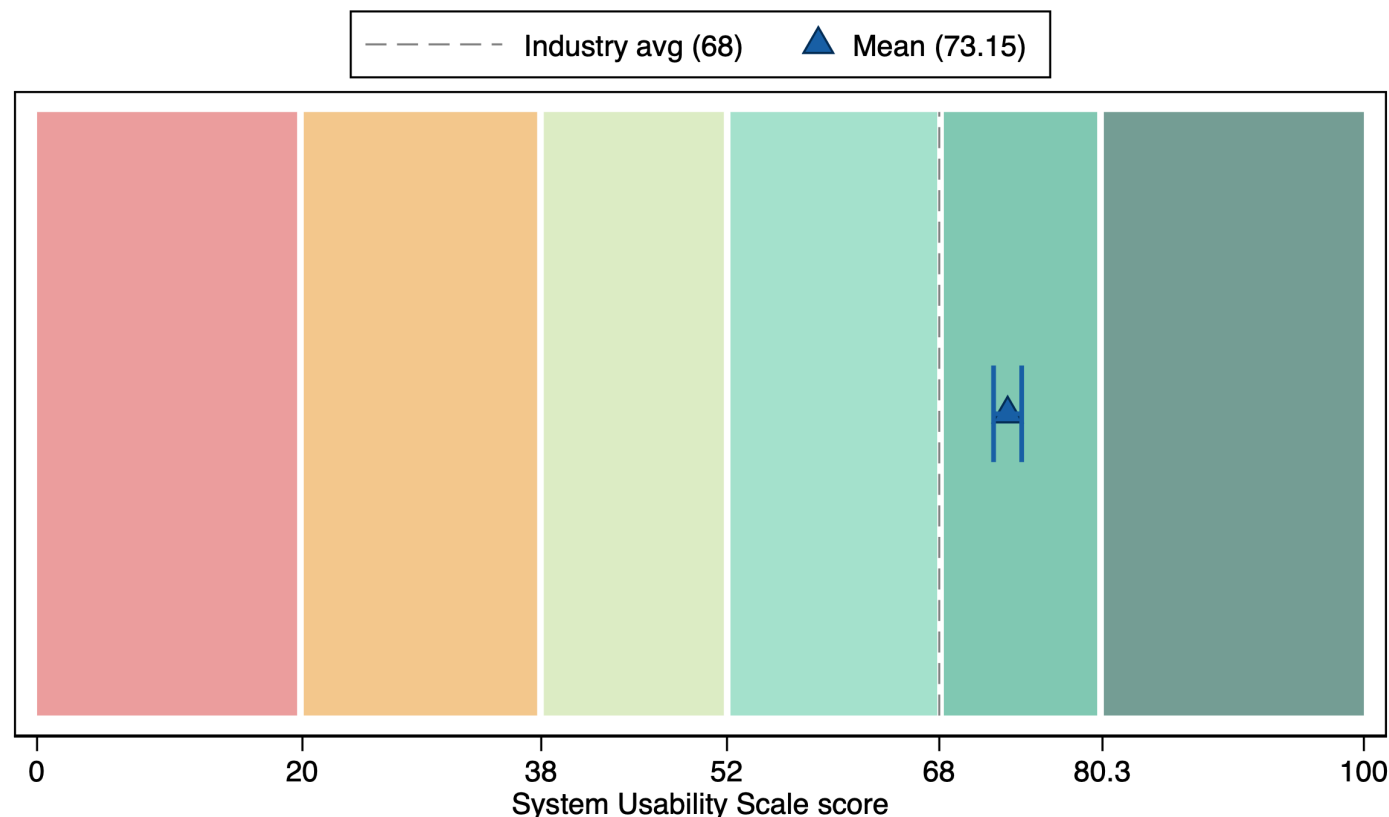
These data were used to make final tweaks to the data dashboard

SUS Score

- n=100 (missing excluded)
- **Industry Standard Score: 68%**
- Mean: **73.15%**
- Highest Score: 100%
- Lowest Score: 62.45%

SUS Mean: 73.15 (SD=5.38) — Good (Grade B, ~66th percentile)

Median: 72.5 | 95% CI [72.09, 74.21] | n=100



Adjective ratings: Bangor, Kortum & Miller (2008). Int J Human-Comput Stud, 66(12):757-767.
Acceptability thresholds & percentile norms: Sauro & Lewis (2011). CHI Extended Abstracts.
Bootstrapped 95% CI recommended given skewness=1.29, kurtosis=8.26 (Lewis 2018).



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CTN-0135 Data Dashboard

Click on menu bar to move through sections

CTN-0135 Dashboard Welcome Patients' Use of Drugs More about the survey Meet the Study Team Contact Us

Welcome to the CTN-0135 study dashboard!

We developed this dashboard to share the results of a national survey of buprenorphine clinicians regarding problems they may have encountered when starting buprenorphine in patients with fentanyl.

Why Does Fentanyl Complicate Buprenorphine Treatment?

Fentanyl is a highly potent opioid compound, with a high affinity at the mu opioid receptor, and there is a lot of variability in how long it takes patients to clear fentanyl from their system ([days to weeks](#)). Some patients using fentanyl may experience opioid withdrawal symptoms when they start buprenorphine treatment, while others may not believe that buprenorphine 'works' or they may prefer other medications ([like methadone](#)) .

Survey Details:

An online survey was sent to a national random sample of clinicians and 396 clinicians completed it. The survey included 96 questions including: 1) characteristics of patients who used fentanyl, 2) standard clinical procedures to start buprenorphine treatment, 3) how clinical procedures have been modified for patients who used fentanyl and 4) clinician/practice setting characteristics.

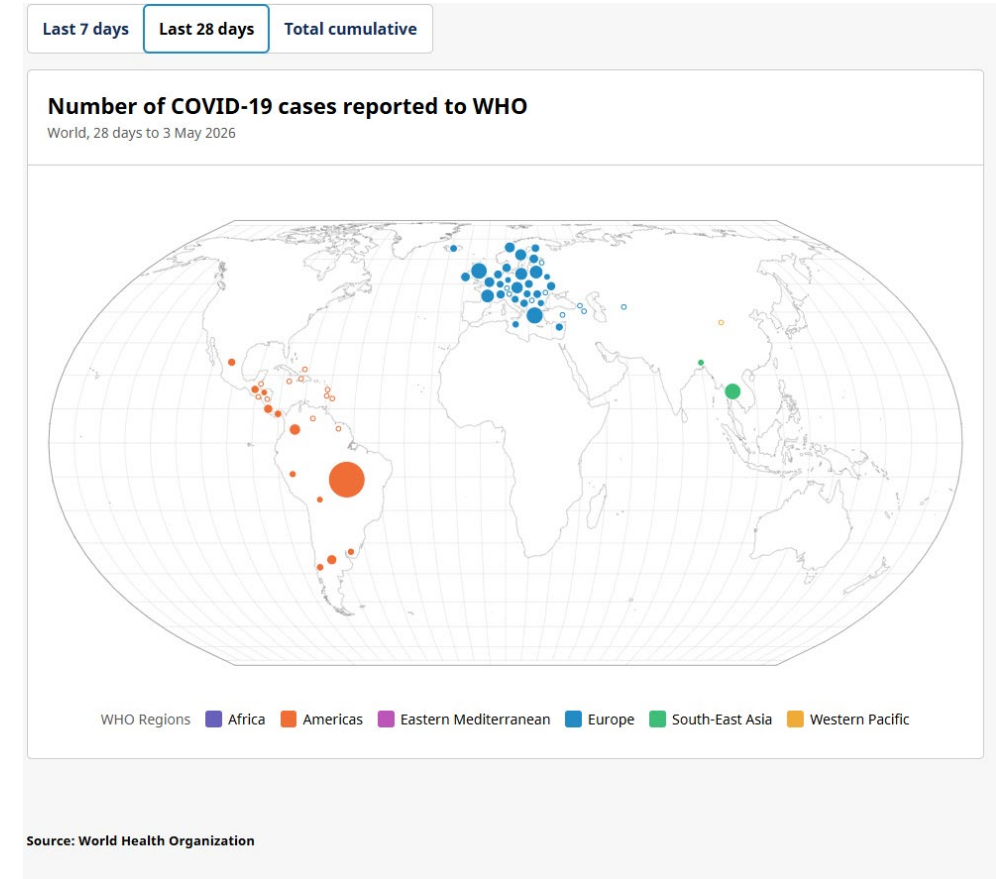
Interpreting the Survey Results:

The survey results are from the clinician perspective and hence the data is not at the patient-level. While the survey data can be aggregated at the state-level, the number of survey respondents within a given state is limited and they may not represent all clinicians treating patients with buprenorphine within a specific state. Additionally, clinician perspectives on problems initiating buprenorphine treatment are reflective of the level of care in which they prescribe buprenorphine.



Dashboards in Other Contexts

- Health data dashboards are often designed for highly specialized audiences (i.e., analytics reports)
- Dashboards designed for lay audiences emerged to track data during the COVID-19 pandemic
- Dashboards are increasingly being used for clinical trial tracking and monitoring
- Local/state communities are using to track overdose deaths



data.who.int/dashboards/covid19/



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Conclusions

- Overall, the data dashboard evaluation results suggest that it is a **feasible dissemination strategy** for a clinical audience → it was easy to use, clinicians would recommend it to their colleagues & it was found to be clinically relevant
- Scientific manuscripts have **low overall reach**, particularly among non-scientists, which limits the ability to inform clinical or public health practices
- While data dashboards have primarily been used for **disease surveillance**, it can be a tool to improve the usability, reach and transparency of federally-funded research
- Future work should integrate **users into the development process** & consider visualization literacy, as well as computer skills (Concannon et al. 2019)

Acknowledgements & Funding

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