UCDAVIS CURES 2.0

California PDMP Enhancement, Analysis, and Response Initiative

Washington, DC
September 6-8, 2017

UC DAVIS CURES 2.0

Outline

1. CURES 2.0 Implementation
2. Research Project Overview
3. Evaluating de-duplication of PDMP data
4. Tracking PDMP registration and use
5. Statewide physician and prescriber survey
6. Next Steps

UCDAVIS CURES 2.0

CURES 2.0 Implementation

1939 Triplicate Prescription Program

2005 CURES “1.0” System

2009 CURES introduced a searchable, client-facing component

2011 Dissolution of Bureau of Narcotic Enforcement; CURES defunded

2015 CURES 2.0 went live
Harold Rogers grant award

UCDAVIS CURES 2.0

CURES 2.0 Implementation

1939 Triplicate Prescription Program

2005 CURES “1.0” System

2009 CURES introduced a searchable, client-facing component

2011 Dissolution of Bureau of Narcotic Enforcement; CURES defunded

2013 California SB 809 (Stats 2013, Chapter 400, DeSaulnier)

2015 CURES 2.0 went live
Harold Rogers grant award

UCDAVIS CURES 2.0

CURES 2.0 Implementation

California SB 809 (Stats 2013, Chapter 400, DeSaulnier) was signed by the Governor on September 27, 2013.

- Mandatory prescriber and dispenser registration
- Provided funding for CURES 2.0 system build
- Established funding mechanism to support operation and maintenance of the CURES system

UCDAVIS CURES 2.0

CURES 2.0 Implementation

CURES 2.0 Features

Automated Registration

Delegation Authority

Patient Safety Alerts

Compact Flagging

Peer-to-Peer Communication

UC DAVIS CURES 2.0

Research Project Overview

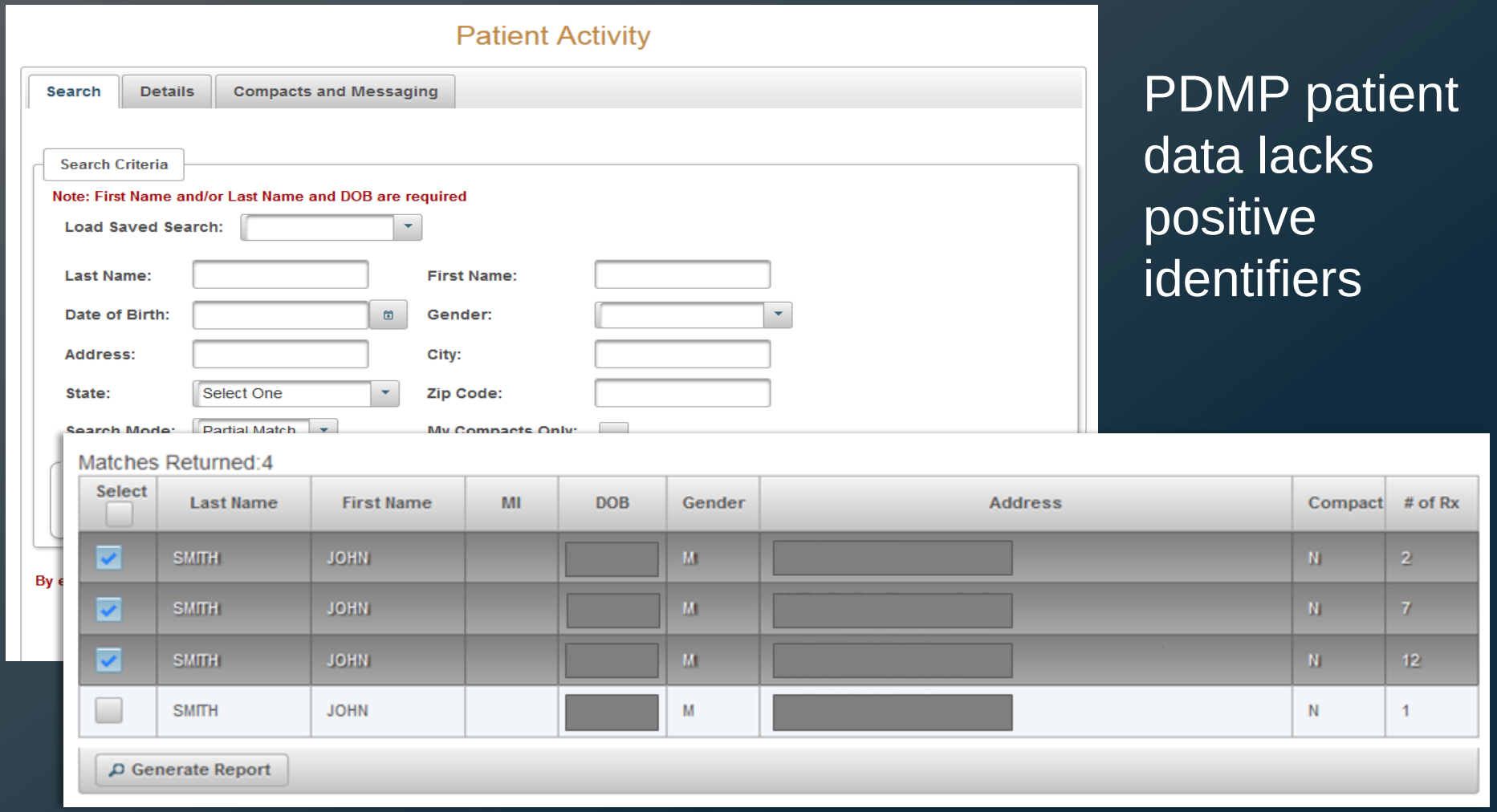
(Harold Rogers Grant Award # 2015-PM-BX-K001)

Practitioner-researcher partnership between California DOJ and UC Davis that includes evaluating:

- Implementation of CURES 2.0
- PDMP data de-duplication quality
- Effect of CURES 2.0 on PDMP registration & use
- User recommendations for optimizing PDMP utility
- Effect of CURES 2.0 on prescribing and overdose rates

UCDAVIS CURES 2.0

PDMP Data De-duplication



PDMP patient data lacks positive identifiers

UCDAVIS CURES 2.0

PDMP Data De-duplication

CURES 2.0 de-duplication

- Patient Safety Alerts- Analytics engine performs medicinal calculations on resolved patient's prescription records based on date filled and number of days supply. Therapy levels exceeding defined thresholds trigger Patient Safety Alerts to current prescribers.

- Quarterly de-identified county and statewide data sets for public health officers and researchers

UCDAVIS CURES 2.0

PDMP Data De-duplication

Goals

- Identify prescriptions for the same individual
- Compare record linkage programs
- Inform PDMP best practices

Challenges

- No unique patient identifier
- Variation in identifying data for an individual
- Hundreds of millions of records

UCDAVIS CURES 2.0

PDMP Data De-duplication

Strategy: Compare record linkage programs

- CURES 2.0 custom-built program
  - SAS application
- The Link King: http://www.the-link-king.com/index.html
  - SAS application
- Link Plus: http://www.cdc.gov/cancer/npcr/tools/registryplus/lp.htm
  - Microsoft Windows stand-alone application
- LinkSolv: http://www.strategicmatching.com/products.html
  - Microsoft Access application

UC DAVIS CURES 2.0

PDMP Data De-duplication

Approach

- Start with exact matching of prescription record identifiers (This decreased the size to ~60 million records)
- Evaluate linkages within a smaller geographic area
- Start with ~500,000 records in contiguous geographic areas.

UCDAVIS CURES 2.0

PDMP Data De-duplication

Entity Resolution

- Compare pairs of records to determine whether they match
- Assign score to indicate match quality
- Determine which records correspond to the same entity based on match results

UC DAVIS CURES 2.0

PDMP Data De-duplication

Statistics to Compare

- Sensitivity: proportion of true matches identified by the program
- Specificity: proportion of true non-matches identified by the program
- Positive predictive value: proportion of identified matches that are true matches
- Negative predictive value: proportion of identified non-matches that are true non-matches

UC DAVIS CURES 2.0

PDMP Data De-duplication

Validation Procedure

Stratify data by certainty of linkage

- From high to low confidence in a match

Reviewers will inspect a stratified random sample of matches

- Identity of the program and certainty of the match is withheld
- “Truth” determined by majority opinion

UCDAVIS CURES 2.0

PDMP Data De-duplication

Preliminary Findings

Link Plus & Link King can match records with:

- First and last name switched

  e.g. "STEPHEN HENRY" & "HENRY STEPHEN"

- Single and double last name

  e.g. "SUSAN LEROY" & "SUSAN LEROYSTEWART"

CURES 2.0 does not consider records with these name variations as matches

Are these additional matches correct?

UCDAVIS CURES 2.0

PDMP Data De-duplication

Technical Challenges

CURES 2.0 data stored in Oracle databases accessible through SAS Enterprise Guide (EG)

- None of the 3 linkage programs can access Oracle databases directly
- Data files must be converted to acceptable types for Link Plus and LinkSolv
- Link King does not operate with EG and the Unix version was unable to access the servers

  (Installed SAS for Windows to use Link King)

UCDAVIS CURES 2.0

PDMP Registration and Use

Registration metrics

- Number of users registered for CURES
- Compliance with CURES mandatory registration

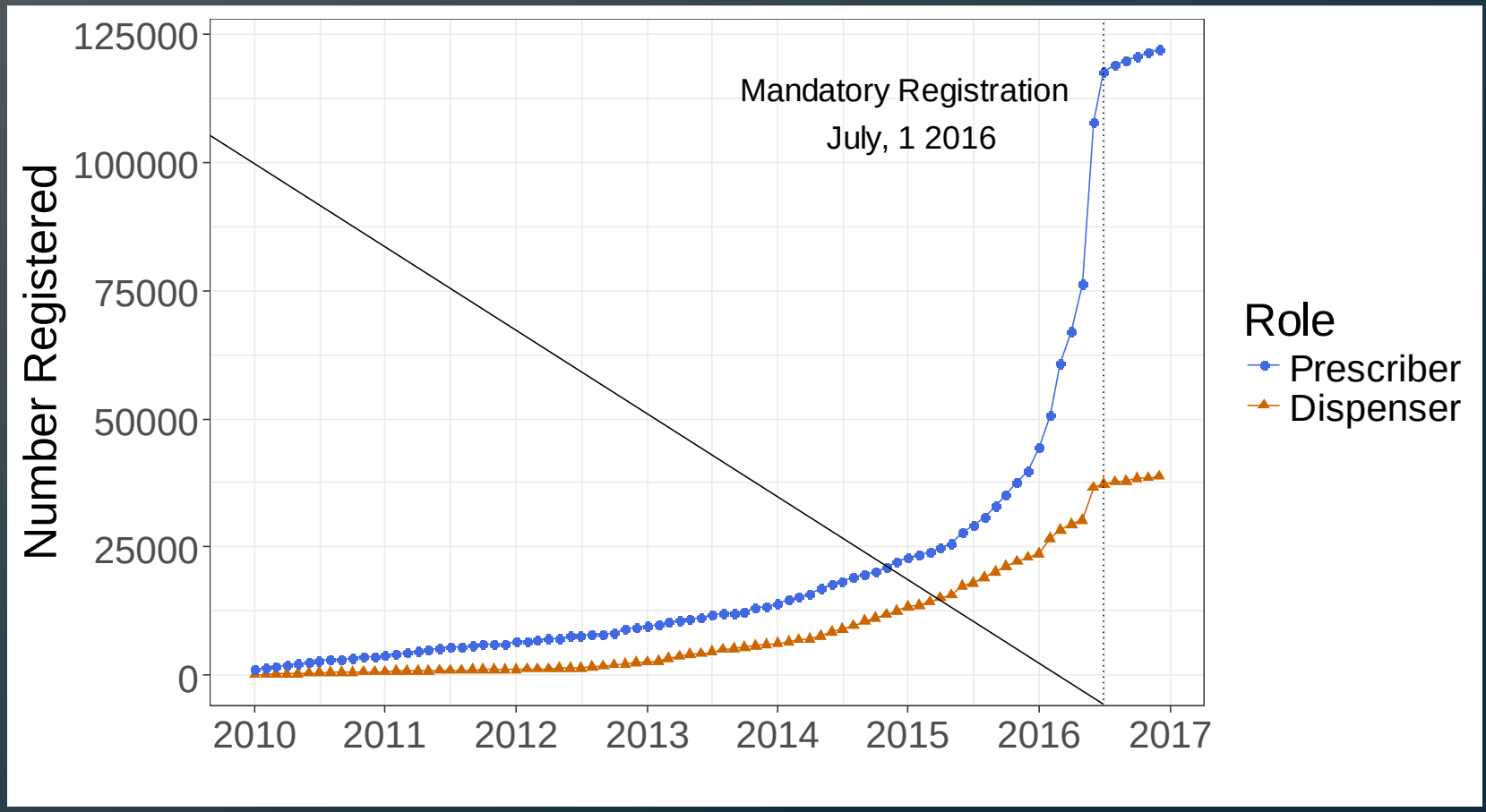
Use metrics

- Number of patient reports downloaded monthly
- % of users downloading ≥1 report per month

UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP Registration Counts



UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP registration compliance for pharmacists

There is a simple 1-to-1 match between pharmacist license and registration

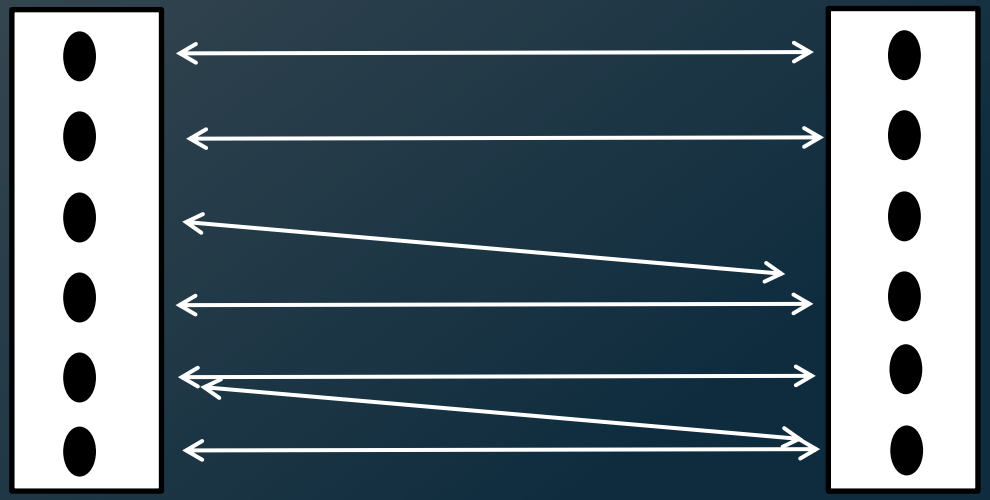
$$\% \text{ compliance} = \frac{\text{CURES users with a pharmacist license}}{\text{Total pharmacists licensed in California}}$$

UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP registration compliance for prescribers

Only prescribers with DEA licenses are required to register. There is no crosswalk file or 1-to-1 match between DEA and prescriber licenses



UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP registration compliance for prescribers

Method 1: CURES data only

$$\% \text{ compliance} = \frac{\#\text{ DEA licenses associated with a CURES user account used to prescribe each month}}{\#\text{ DEA licenses used to prescribe in past year}}$$

(Similar to approach recommended by TTAC)

UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP registration compliance for prescribers

Method 2: CURES data and DEA data

$$\% \text{ compliance} = \frac{\text{\# DEA licenses associated with a CURES user account used to prescribe each month}}{\text{Total \# DEA prescriber licenses in California}}$$

(Captures “inactive” DEA-licensed prescribers)

UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP registration compliance for prescribers

Method 3: License counts and survey data

% compliance =

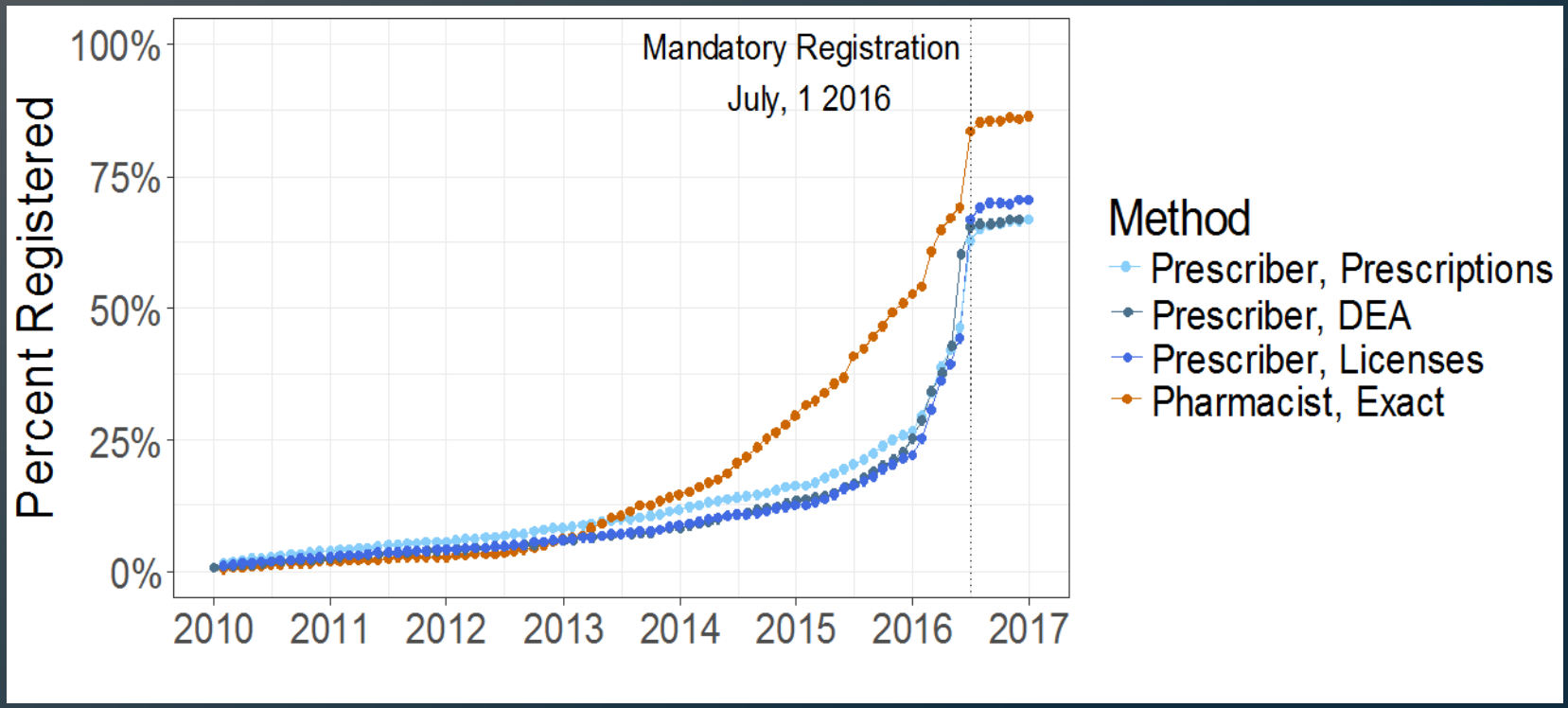
(Total active physician licenses in CA) X (% of active physicians with a DEA license)

(Data from medical boards and physician survey)

UCDAVIS CURES 2.0

PDMP Registration and Use

PDMP Registration Compliance

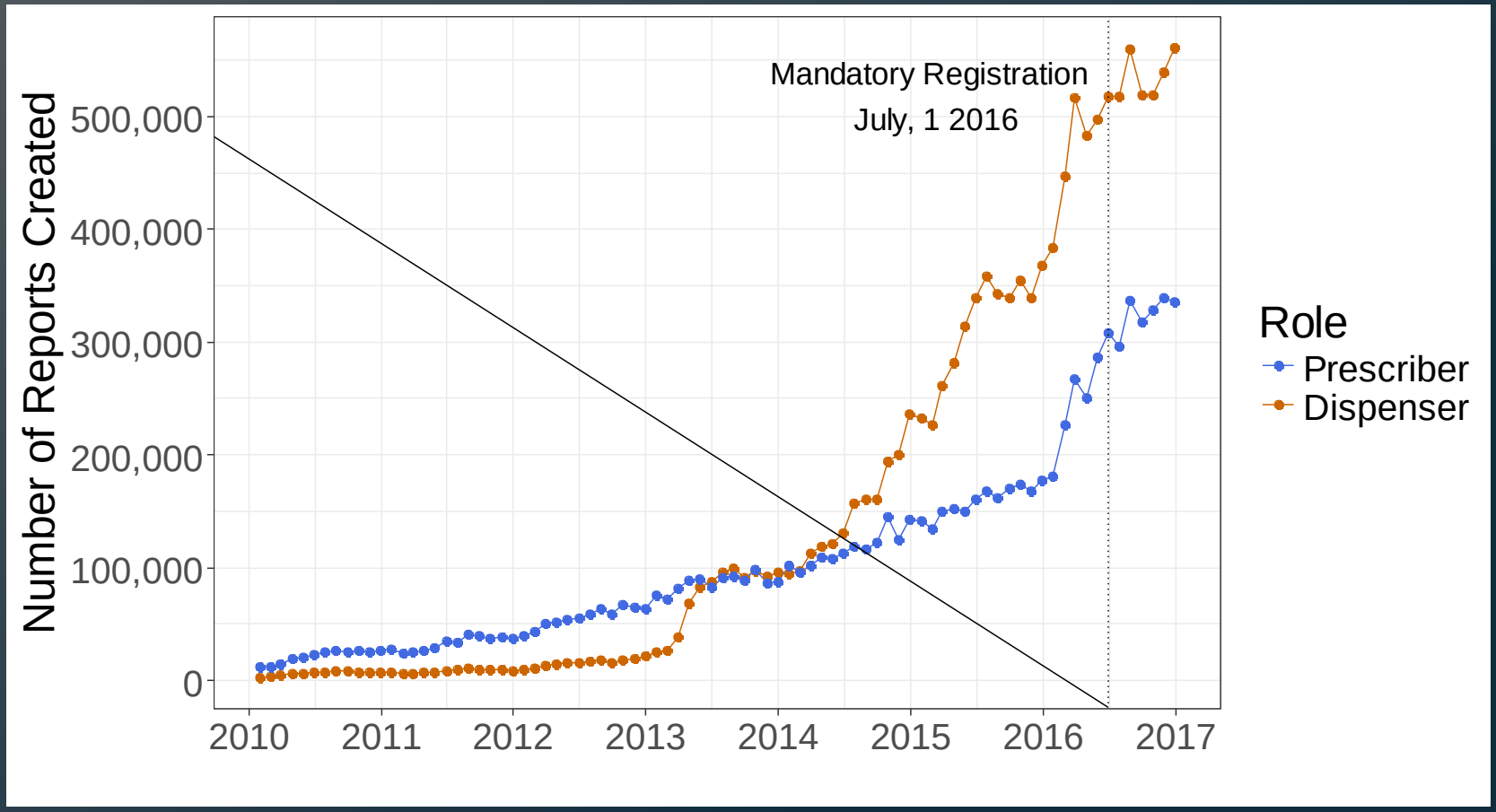


All 3 methods for estimating prescriber compliance give similar results

UCDAVIS CURES 2.0

PDMP Registration and Use

Patient reports created monthly



UCDAVIS CURES 2.0

PDMP Registration and Use

Implications

- Mandatory CURES registration successful
- Tracking statewide prescriber compliance appears feasible
- Enforcing mandatory registration for individuals is not possible with CURES data alone

UCDAVIS CURES 2.0

PDMP User Survey

Survey of California physicians and pharmacists

Survey Goals

- Practical feedback on CURES 2.0 for stakeholders (CA DOJ, Regulatory Boards, CA Public Health, CURES end-users)
- Attitudes about PDMP
- PDMP usage patterns & effect on prescribing

UCDAVIS CURES 2.0

PDMP User Survey

Survey Approach

- Quasi-random sample of MDs, DOs, and Pharmacists based on practitioner birth month

- Partnership with MD, DO, and Pharmacy boards
  - Initial invitations sent with license renewal paperwork
  - Periodic print and email reminders
  - Online only survey (Qualtrics)

- Survey period: August 2016 – January 2017
  - Response rate: 23% prescribers, 31% pharmacists

UCDAVIS CURES 2.0

PDMP User Survey

Are you registered for CURES 2.0?

	Physician*	Pharmacist
Yes/In Process	82% (1049)	96% (474)
No	10% (132)	2% (11)
Don't know	8% (105)	1% (7)

** Excludes physicians without DEA license*

UCDAVIS CURES 2.0

PDMP User Survey

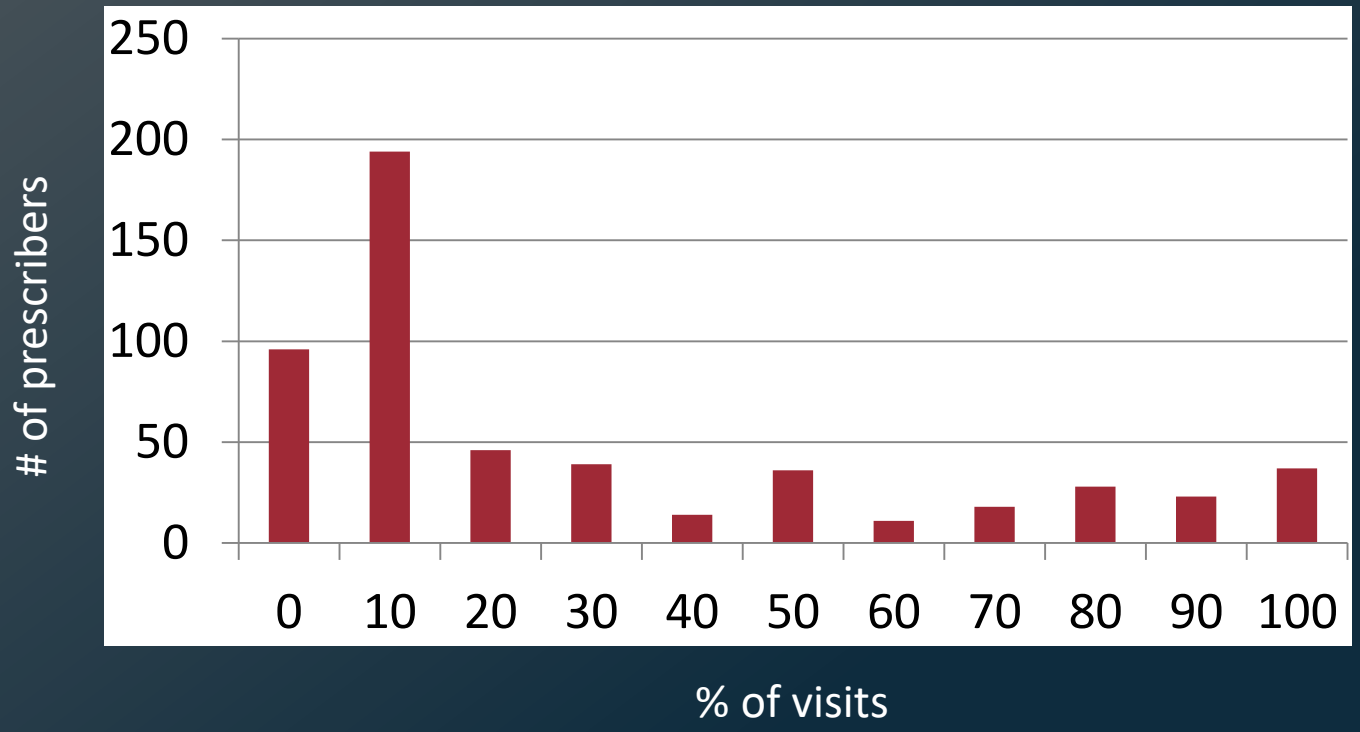
How likely are you to use CURES 2.0 at least once in the next 3 months?

	Physician	Pharmacist
Ext. Likely	30% (304)	46% (207)
Likely	24% (247)	17% (75)
Unlikely	24% (244)	17% (78)
Ext. Unlikely	23% (235)	21% (93)

UCDAVIS CURES 2.0

PDMP User Survey

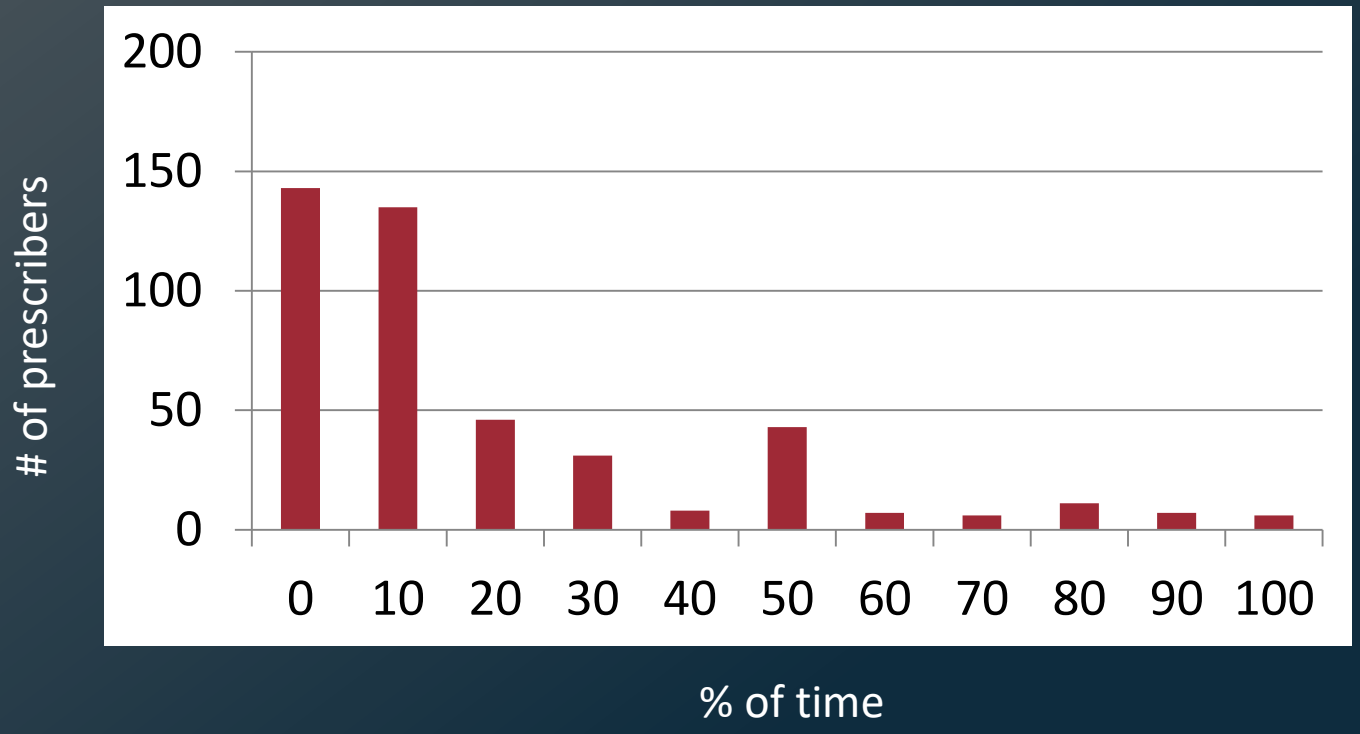
Thinking about the past 3 months, what percentage of patient visits that resulted in a controlled substance prescription did you review CURES 2.0 information?



UCDAVIS CURES 2.0

PDMP User Survey

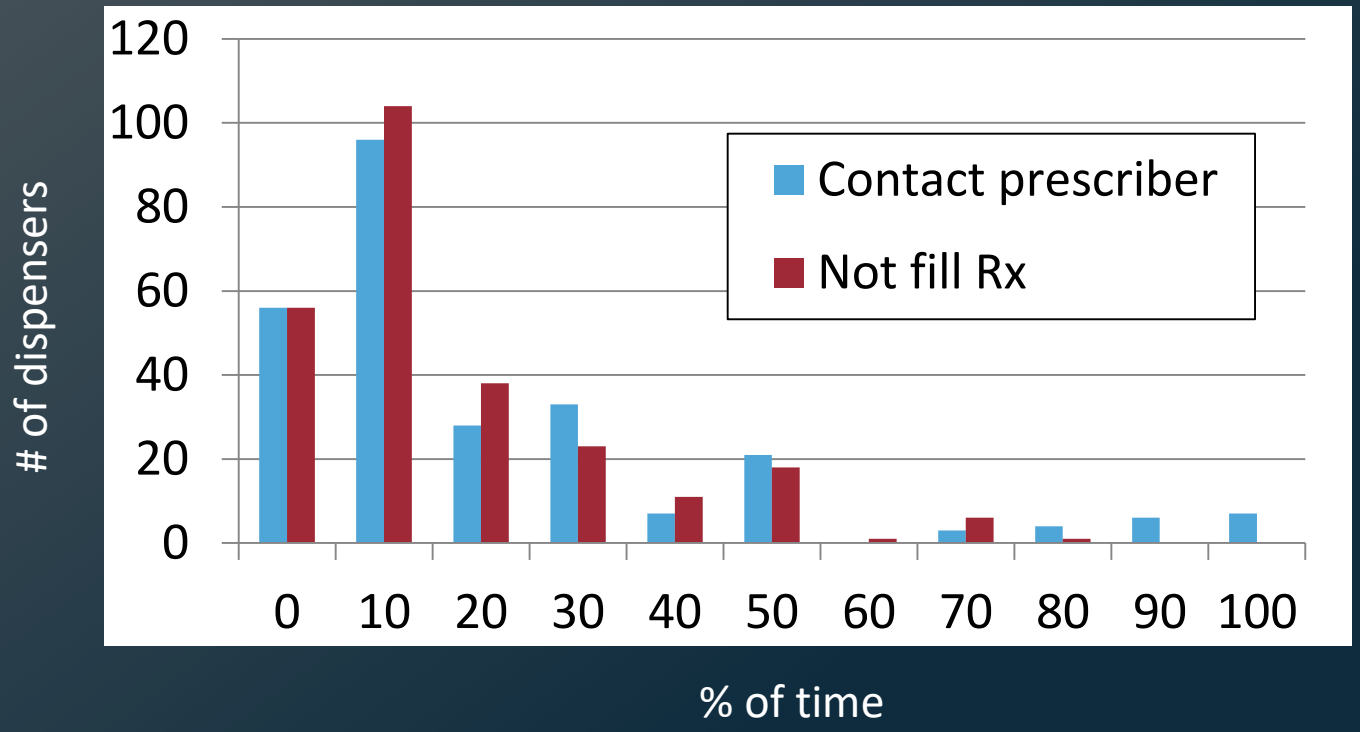
In the past 3 months, when you checked CURES 2.0, what percentage of time did the PDMP information alter your prescribing decision?



UCDAVIS CURES 2.0

PDMP User Survey

In the past 3 months, what percent of the time when you checked CURES 2.0 did the information prompt you to…



UCDAVIS CURES 2.0

PDMP User Survey

Should clinicians check CURES 2.0 prior to writing a controlled substance prescription?

	Physician	Pharmacist
YES	81% (746)	76% (371)
NO	19% (179)	17% (83)

UCDAVIS CURES 2.0

PDMP User Survey

Should clinicians be required to check CURES 2.0 prior to writing a controlled substance prescription?

	Physician	Pharmacist
YES	23% (225)	39% (154)
NO	77% (764)	61% (238)

UCDAVIS CURES 2.0

PDMP User Survey

Using CURES 2.0 when prescribing/dispensing controlled substances is considered a standard of care.

	Physician	Pharmacist
St. Agree	14% (164)	30% (138)
Agree	24% (295)	38% (175)
Neutral	38% (452)	23% (108)
Disagree	16% (195)	6% (27)
St. Disagree	8% (99)	3% (14)

UCDAVIS CURES 2.0

Next Steps

- Track changes in prescribing patterns and overdoses before and after CURES 2.0 implementation
- Utilize Prescription Behavior Surveillance System (PBSS) data from other states as a comparison for California
- Implementation of CURES mandatory use (2018)

UCDAVIS CURES 2.0

Questions

University of California Davis
Stephen Henry (sghenry@ucdavis.edu)

California Department of Justice
Tina Farales (tina.farales@doj.ca.gov)
Mike Small (mike.small@doj.ca.gov)

UC DAVIS CURES 2.0

thank you!