

Evaluation Brief

Riverside University Health System — Public Health
Riverside Overdose Data to Action

November 2021 |

Enhanced Overdose Surveillance: Year 2 Progress & Evaluation

Established September 2019, the Riverside Overdose Data to Action (RODA) program is integrated into Riverside University Health System (RUHS) - Public Health's Epidemiology and Program Evaluation Branch. The purpose of RODA is to enhance surveillance of overdose morbidity and mortality and to use enhanced surveillance data to guide overdose prevention efforts [Figure 1]. Funded by the Centers for Disease Control and Prevention (CDC), the program is organized around six overarching strategies [Figure 2]. The cornerstone of RODA is enhanced overdose surveillance. This surveillance data is used to advance local insight into overdose incidence in Riverside County and create more responsive and collaborative prevention efforts (the six prevention strategies of RODA) to address the upstream causes of substance use disorders and overdose.

Key activity areas within the surveillance strategy are:

- Monthly Overdose Morbidity and Mortality Surveillance Reporting.
- Overdose Outbreak Alert Protocol.
- Enhanced Surveillance of Overdose Mortality.

This brief will discuss the implementation of RUHS - Public Health's overdose surveillance system including successes and barriers encountered, ending with recommendations for year 3.

Future Evaluation Briefs will highlight each of the remaining prevention strategies: Prescription Drug Monitoring Programs, Integration of State and Local Prevention and Response Efforts, Establishing Linkages to Care, Providers and Health Systems Support, and Empowering Individuals to Make Safer Choices [Figure 2].

KEY MILESTONES

- ▶ Multi-disciplinary overdose surveillance team established.
- ▶ Robust overdose surveillance reporting established.
- ▶ Outbreak alert protocol established.
- ▶ RODA activities continue successfully despite significant challenges from the COVID-19 pandemic.

Figure 1: Enhanced Surveillance Simplified Logic Model



The logic model below [Figure 2] shows the strategies, activities and expected outcomes of the RODA project. This brief discusses the surveillance activities and outcomes highlighted in red.

Figure 2: Riverside Overdose Data to Action (RODA) Logic Model

Riverside Overdose Data To Action (RODA) Logic Model				
	Strategies and Activities	Short-term Outcomes	Intermediate Outcomes	Long-term Outcomes
Component 1: Surveillance	Implement innovative surveillance to support RODA interventions: enhanced surveillance capacity building; strengthen cross agency data sharing; explicit efforts to improve partner and community access to timely surveillance data.	Timely and actionable surveillance data disseminated by recipients: to enhance the implementation of RODA interventions; to recipients’ stakeholders working to reduce drug overdoses in Riverside County; to CDC to rapidly inform the public and key regional and national stakeholders	RODA surveillance data contributed to improvements in drug overdose interventions	Decreased rate of opioid misuse and opioid use disorder Increased provision of evidence-based treatment for opioid use disorder
	Prescription Drug Monitoring Programs: Access and utilize the Controlled Substance Utilization Review and Evaluation System (CURES) data to help inform overdose surveillance; Access and utilize CURES data to help guide prevention activities.	Increased measurable collaboration and communication; increased application of data to drive prevention and response activities between state and local efforts.	Identification of high risk prescribing and patient behaviors; better tracking of opioid prescriptions.	Decreased rate of ED visits due to misuse or opioid use disorder
Component 2: Prevention	Integration of State and Local Prevention and Response Efforts: Explicit efforts to better integrate state and local prevention efforts; Enhance coordination of prevention and response strategies at the state and local level; improve local and state awareness of local overdose mortality for policy and systems change.	Increased understanding of context, resources, and needs in Riverside County, CA; increased focus on highest risk groups; policy and systems change recommendations produced.	Greater awareness of drug and opioid overdose epidemic by state health departments, with respect to burden and resources, including at the city/county level; increased state involvement in local-level prevention efforts; increased preparedness and response at the local level.	Decreased drug overdose death rate, including prescription and illicit opioid overdose death rates
	Establishing Linkages to Care: Identify systems-level strategies in healthcare, community programs, and public safety to support care linkages with improved awareness, coordination, and technology.	Increased awareness and coordination of linkages to care.	Increased referrals to and engagement in evidence-based treatment.	
	Providers and Health Systems Support: Clinical education and training based on evidence-based guidelines; insurer and health systems supports.	Provider, health system, and payer awareness of and supports for guideline-concordant opioid prescribing, non-opioid medications, and non-pharmacological treatments; Provider, health system, and payer awareness of and supports for medically assisted treatment for opioid use disorder and SAMHSA practitioner (X) waiver training and application process.	Increased use of non-opioid medications and non-pharmacologic treatments for pain by patients; decrease in high-risk opioid prescribing; increase in the number of providers with and use of X-waivers.	
	Empowering Individuals to Make Safer Choices: Build overdose prevention and lifesaving skills among high-risk youth; train first responders on trauma-informed practices; develop mass media campaign on harm reduction strategies for youth.	Awareness of the risks of prescription and illicit opioids; Increase number of youths trained in overdose prevention; Increase number of first responder trained in trauma-informed practices, safe coping skills, symptoms of behavioral health challenge; types and number of messages developed.	Decreased initiation of opioid use and misuse; Raise awareness among high-risk youth of overdose prevention; Raise awareness for trauma-informed practices, safe coping skills, and symptoms of behavioral health challenges.	

Evaluation Goals and Questions

The internal evaluation of RODA's strategies is designed to collect information that will convey a credible, well-rounded picture of the program's efforts, highlighting what works well and areas that may need improvement. There are two overarching evaluation questions for the surveillance strategy:

- In what ways has situation awareness of drug overdoses in Riverside County improved?
- How has enhanced overdose surveillance data been used by RODA prevention programs and partners?

Lead Partners for Enhanced Overdose Surveillance

Riverside University Health System – Public Health (RUHS - Public Health):

- Epidemiology and Program Evaluation Branch (EPE)– As the lead Riverside County Public Health branch in the development and implementation of the RODA project, EPE coordinates the administrative, management, technical, and collaborative surveillance and prevention strategies.
- Office of Vital Records – As the office responsible for registering all births and deaths that occur in Riverside County, the Office of Vital Records uses the California-Integrated Vital Records System to provide death certificate data for overdose mortality surveillance.

Riverside County Emergency Medical Services Agency (REMSA) – REMSA regulates, supports, monitors and manages both emergency and non-emergency response of pre-hospital care within Riverside County.

Riverside County Sheriff-Coroner's Bureau (RSO)- The Coroner investigates and reports on all violent, sudden or unusual deaths of persons within the County as established by California law.

Riverside University Health System-Behavioral Health (RUHS-BH) – As the lead department responsible for Riverside County mental health services and substance abuse treatment, their subject matter expertise is vital in the analysis and interpretation of the surveillance data.

Data Systems Used in RODA Enhanced Overdose Surveillance

- Death Certificate data: California Integrated Vital Records System (Cal-IVRS) provides provisional death certificate data.
- Coroner data: Coroner investigation, toxicology, and autopsy reports on all overdoses in Riverside County. These reports provide rich details on the circumstances surrounding a persons death, substances in the persons system, and notations on the analysis of the body. Depending on the report, this data is typically available within a few days (investigation) to a few months (toxicology) after a persons death.
- Emergency Department Syndromic Surveillance: Using the Electronic System for the Early Notification of Community Based Epidemics (ESSENCE) to monitor overdose indicators in near real-time (24—48 hours) to detect outbreaks. Currently out of 17 eligible hospitals in Riverside County, 15 are actively submitting de-identified data from emergency department patient encounters.
- Ambulance, Paramedic, Fire Department (911) Patient Data: Unified Electronic Patient Care Record System (ePCR) using FirstWatch provides near real-time data on first responder patient interactions. Variables include, date, time of incident, complaint, primary & secondary impressions, zip codes, city, patient disposition, initial & final acuity, age, gender, Narcan administration, and drug mentioned.
- Poison Control: Daily de-identified reports from the California Poison Control System are sent to the RODA team. Variables include: intent (accidental/intentional), date, city, gender, age, type of substance.

Baseline/Context

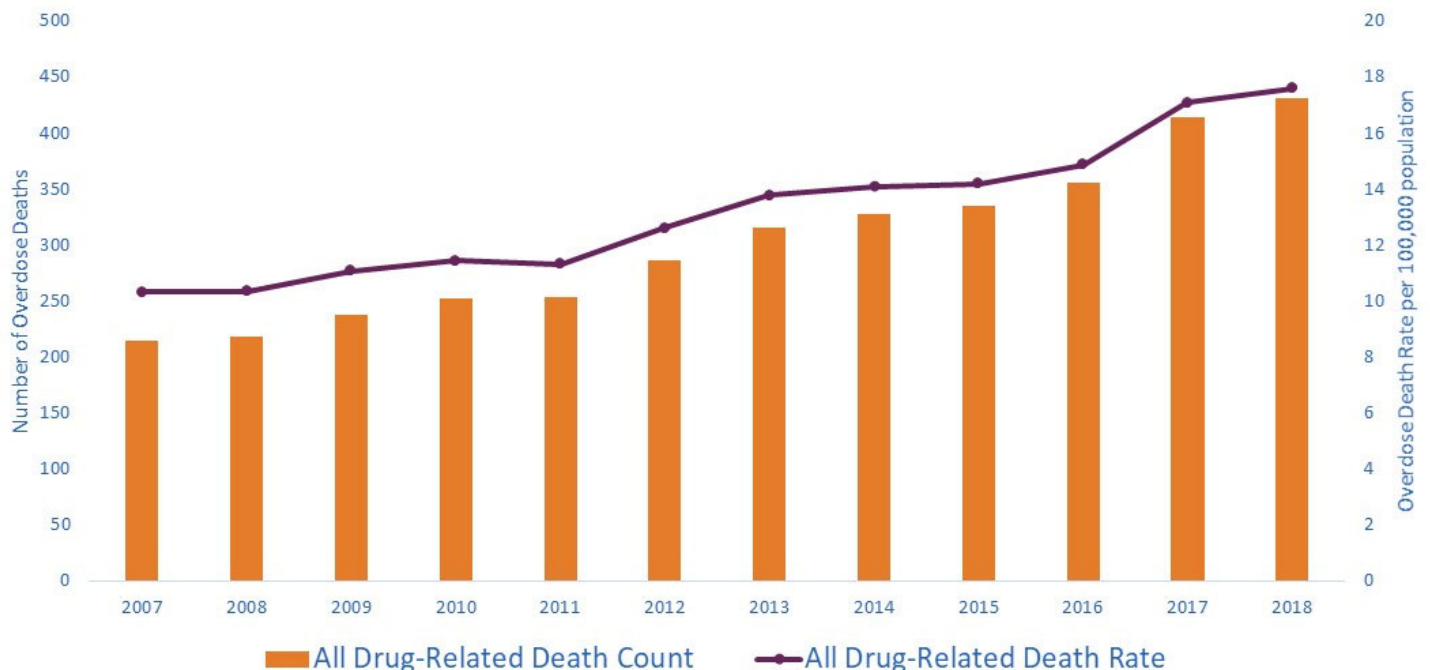
From 2008 to 2017, Riverside County saw a sharp increase in overdose death numbers and rates [Figure 3]. Overdose deaths increased from 230 deaths in 2008 to 430 deaths in 2017 and rates increased 63% from 2008 to 2017 (from 11 to 18 per 100,000). Riverside County trends depicted a 10-year increase in overdose deaths, emergency department (ED) visits, and hospitalizations. For up-to-date data on overdoses in Riverside County see the [RODA Overdose Data Dashboard](#).

Before the RODA program, RUHS - Public Health produced four data reports on substance use between 2008 – 2019, had no standardized overdose surveillance system, and no overdose outbreak monitoring system. Further, RUHS - Public Health, Riverside County EMS Agency, the Sheriff-Coroner’s Bureau, and RUHS-Behavioral Health efforts toward the overdose crisis were siloed rather than coordinated. Due to these factors, RUHS - Public Health applied for and received funding from the Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). Funding began September 1, 2019, for the Riverside Overdose Data to Action program.

Impact of COVID-19 on RODA operations

Beginning in March 2020, many of the core and supporting RODA staff were required to work at the Riverside County Emergency Operations Center (EOC). During this time, our epidemiologists and research analysts were conducting contact tracing and statistical modeling to understand the impact of COVID-19 in Riverside County. The public health nurses were monitoring calls on the Public Health nurse call line, contact tracing, and conducting follow-up with patients in quarantine. The RODA project investigator, program director, and program coordinator were all involved with planning and operational duties to ensure an effective county-wide response to COVID-19. The program director and program coordinator returned to RODA operations full-time in July 2020. As of this report (November 2021), the RODA project investigator, surveillance lead, and the lead evaluator continue to be partially assigned to COVID-19 response.

Figure 3: Historic trend in overdose deaths, Riverside County, 2007—2018



MONTHLY OVERDOSE MORBIDITY AND MORTALITY REPORTING

Objective: RUHS - Public Health, REMSA, and the Sheriff-Coroner’s Bureau will produce and disseminate an overdose morbidity and mortality monthly surveillance report to local and state partners increasing access to timely and actionable surveillance data.

Year 1 (9/1/2019—8/31/2020):

In the first year of funding, the program was staffed, Data Use Agreements (DUA) were formalized between participating surveillance partners, surveillance team established, indicators and draft visualizations selected to develop a template of the morbidity and mortality reports.

- Overdose surveillance team established (RODA staff, Sheriff-Coroner staff, REMSA staff), monthly meetings established (meetings began 11/5/2019; five meetings occurred in year 1).

Year 2 (9/1/2020—8/31/2021):

Beginning in September 2020, the RODA program began collecting, analyzing and disseminating monthly overdose morbidity and mortality surveillance reports to both internal and external partners. These reports include ESSENCE data (Syndromic Surveillance) and mortality data (Cal-IVRS). In November 2020, Riverside County Emergency Medical Services Agency created an additional report to pair with the monthly overdose morbidity and mortality report. This addition reports on suspected opioid overdoses using FirstWatch data and provides an in-depth overview of suspected overdoses, Narcan administration and type of drugs mentioned in overdose calls.

- Between September 2020 and August 2021, 12 overdose surveillance reports have been generated and disseminated to inform ongoing prevention efforts.
 - September 2020, overdose fatality reports begin.
 - October 2020 ESSENCE emergency department syndromic surveillance data added.
 - November 2020 REMSA reports added to monthly distribution.
- September 2020 - February 2021: Five infographic reports examining coronavirus (COVID-19) impact on overdoses produced.

Surveillance team (Sheriff-Coroner’s Bureau, REMSA, RUHS - Public Health, RUHS-Behavioral Health) met monthly to review ongoing processes, strategize improvements, and examine and highlight data trends of particular concern and report those concerns to prevention partners.

- April 2021, RUHS-Behavioral Health joined the surveillance team. The RODA team is currently exploring how Behavioral Health treatment data may help inform surveillance efforts.

Overdose Surveillance Report Dissemination

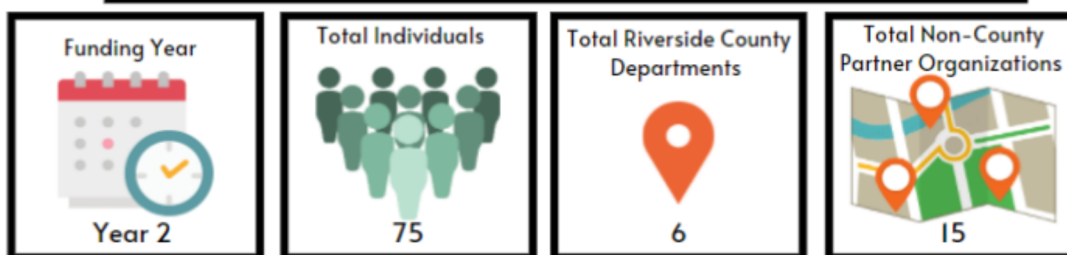


Table 1: Count of individuals and agencies directly receiving surveillance reports. (Does not include numerous partners receiving forwarded reports indirectly)

Barriers / Challenges

- There is a lack of automated processes for data extraction and analysis.
- Need to expand data dissemination efforts to reach more community-based partners.
- Challenges with County’s outdated websites and technology; it is difficult to post recurring information on websites due to processing delays (limited media staffing and COVID-19 media is prioritized).
- Although the 911 ePCR data is carefully reviewed, many of the overdoses can not be confirmed. They are limited to the impressions of the EMS provider that creates the record.

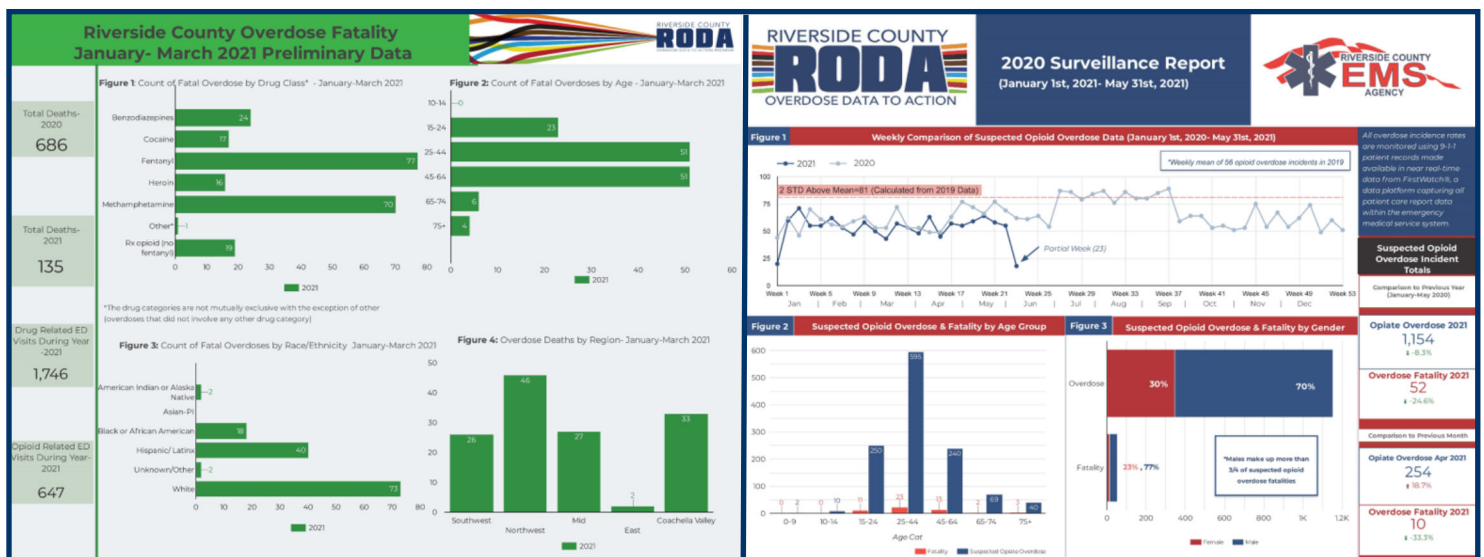
Impact of Monthly Surveillance Reports

Notable milestones include:

- One local coalition of healthcare professionals used the enhanced surveillance data to expand its focus from opioids alone to include harm reduction, methamphetamine prevention, and health equity.
- One local southern California county has met with RODA staff with an interest in modeling RODA’s surveillance program.
- The enhanced surveillance has assisted in tracking and better understanding the increase in fentanyl overdoses throughout the county.
- Helped maintain focus on stimulants such as methamphetamine in RODA prevention programs.
- Informed REMSA policy for “leave behind” naloxone program.
- Surveillance data used to support collaboration and promote need for the Community Assessment and Transport Team (CATT) program.
- Bystander Naloxone Trainings collaborations with REMSA, American Medical Response (AMR), and Inland Empire Harm Reduction.
- Data for frequency of pre-hospital encounters helped demonstrate the need for Trauma Informed Care trainings for EMS providers.

The dissemination of surveillance reports reached statewide partners and created new opportunities for presentations with statewide committees including the California Health and Human Services Agency, Behavioral Health Task Force, as well as national learning collaboratives including the Council of State and Territorial Epidemiologists.

Figure 4: Examples of Monthly Surveillance Reports (first pages)



OVERDOSE OUTBREAK ALERT PROTOCOL

Objective: Develop and implement an overdose outbreak alert system for detecting drug overdose outbreaks in less than 72 hours by rapidly analyzing REMSA, ESSENCE and enhanced mortality surveillance data and alerting RUHS - Public Health leadership and partners to inform the public and mobilize resources.

Year 1 (9/1/2019—8/31/2020):

- Surveillance team identified.
- Surveillance team began preliminary discussions and research on building a local overdose outbreak alert protocol.
- Established access to necessary data sources to identify overdose outbreaks.

(Starting in March 2020, work on this activity was delayed due to RODA staff assignment to COVID-19 response)

Year 2 (9/1/2020—8/31/2021):

In year 2, the alert protocol was developed and is currently being tested and refined. The written protocol includes an overview of the data source, advantages/disadvantages of data source, and frequency of data analysis. The protocol also outlines parameters for identifying and alerting internal and external partners including spike specification triggers and parameters developed for each data source.

- Development of an overdose alert protocol started (September 2020).
- Surveillance team created definitions (spike, cluster, outbreak, etc.) for the alert protocol.
- Alert plan testing and refinement began March 2021.

Near real-time tracking started March 2021 [Figure 5]: 38 suspected clusters with 414 suspected overdoses, 27 elevated for Surveillance Team investigation, one confirmed spike in overdoses countywide, 0 external partners notified due to not meeting original alert criteria. In June 2021, monitoring sensitivity was increased (spike indicated in all three data-sets within 1 week rather than 1 day) and refinement in REMSA data was undertaken to include cardiac arrest in search protocol.

Barriers / Challenges

Before this project, there were no local definitions for an overdose outbreak; no current trigger for identifying all overdoses (only opioids); and no existing local protocols. Currently, there is a lack of automation; FirstWatch is the only data source that is in real-time; outbreaks need to be manually identified by staff through daily analysis of data.

Impact of Outbreak Alert Protocol

The development and testing of the alert protocol system has improved the internal surveillance team’s understanding of overdose spikes/outbreaks in Riverside County.

Figure 5: Outbreak Monitoring Spreadsheet

MONTH	Date of Spike	Data System	Number of Suspected Overdoses/ER Visits/EMS Calls	Date Reporting
March	3/16/2021	ESSENCE		3/19/21
April	4/16/2021	Suspected Overdose	5	4/20/21
	4/18/2021	Suspected Overdose	8	4/20/21
	4/20/2021	Suspected Overdose	6	4/20/21
	4/20/2021	Suspected Overdose	1	4/20/21
MAY	5/2/2021	ESSENCE	28	5/5/2021
	5/15/2021	Suspected Overdose	5	5/18/2021
	6/1/2021	ESSENCE	31	6/8/2021
	6/6/2021	Suspected Overdose	7	6/8/2021
	6/13/2021	FirstWatch	16	6/16/2021

ENHANCED SURVEILLANCE OF OVERDOSE MORTALITY

Objective: RUHS—Public Health and the Sheriff-Coroner's Bureau will develop and implement enhanced surveillance of fatal overdoses in Riverside County using death certificate data, Coroner's reports, autopsy reports, and toxicology reports.

Year 1 (9/1/2019—8/31/2020):

RUHS - Public Health partnered with Riverside County Sheriff-Coroner's Bureau (RSO) as part of RODA. A Certified Crime and Intelligence Analyst from RSO is co-located within RUHS - Public Health, facilitating the collection, analysis, and interpretation of coroner's reports, including toxicology and autopsy.

- Supervising Crime Analyst assigned to RODA (October 2019).
- Processes for data sharing, analysis and reporting established.
- Enhanced overdose mortality surveillance begins.
- Developed methodology for analyzing combined overdose mortality data by drug type and geography.

Before the RODA project, RUHS—Public Health was limited to death certificate data when studying mortality trends. The partnership with RSO has enhanced surveillance data in the following ways:

- Access to more specific toxicology.
- Data on unstably housed/or people experiencing homelessness at time of overdose death.
- If there was recent injection drug use.
- If there was more than one person who experienced an overdose at the location.
- Access to limited sexual orientation and gender identity information.
- If the decedent experienced previous overdoses.
- If the decedent had a recent history of substance use treatment.
- If the decedent was recently incarcerated.

Year 2 (9/1/2020—8/31/2021):

- Data collection of coroner data increased from weekly to daily.
- Pilot project started with California Department of Public Health (CDPH) on suspected overdose mortality.

Barriers / Challenges

- Manual data entry of coroner's reports.
- RUHS—Public Health has been understaffed in epidemiologists for a county of our size, delaying some analysis.

Impact of Enhanced Overdose Mortality Surveillance

Strong partnership with the Sheriff-Coroner's Bureau created new opportunities to share timely data. This partnership allowed RUHS—Public Health to request daily suspected overdose mortality cases. The co-location of Sheriff-Coroner staff has streamlined the process for data extraction, analysis, and reporting. Initially, reporting of mortality data was among local internal RODA partners but now has expanded to include the California Department of Public Health.

SUMMARY OF EVALUATION QUESTION RESPONSES

In what ways has situation awareness of drug overdoses in Riverside County improved?

Until late 2019, there was no systematic overdose surveillance in Riverside County. Since then, a partnership of four county agencies (RUHS – Public Health, REMSA, RSO, RUHS – BH) has established an overdose surveillance team with monthly data reports, overdose outbreak monitoring, and analysis of enhanced mortality data. This information is disseminated to multiple county agencies and community partners who in turn distribute it to their networks. The improved understanding of overdoses in Riverside County has been used to inform policy and refocus resources.

“We quote OD death trends locally in all of the naloxone training that we provide. We also let our participants know that the lives they are saving with naloxone we’ve distributed to them is having an effect on the number of lives lost locally.” - Staff member, Inland Empire Harm Reduction

How has enhanced overdose surveillance data been used by RODA prevention programs and partners?

The enhanced overdose surveillance data has been used for advocacy, policy change, program development, and community education. As demonstrated throughout this report (e.g. page 6), Riverside County has exemplified the Data to Action model.

Recommendations for Year 3

The recommendations below reflect the position of the authors and not necessarily those of RUHS - Public Health or partner agencies.

1. Funded prevention programs could be more deliberate in their use of surveillance data. If the surveillance team explicitly highlighted important or concerning trends, these could be amplified at each of the monthly prevention strategy briefings to assist programs.
2. The enhanced mortality surveillance is a rich source of important risk factor information. The RODA program should continue to explore additional ways to fully utilize this information for overdose prevention with the understanding that this effort is hindered by the data team’s assignment to COVID-19 response.
3. There is a significant amount of manual data entry, analysis, and reporting that could be streamlined with improved technology. This would give analysts more time for expanded study of surveillance data.
4. With the start of a county-level fentanyl task force, RODA surveillance data will be used to provide situational awareness of fentanyl overdoses in the county. The year 3 evaluation should develop methods for capturing how the task force uses data to guide policy development.

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