

# MiCelerity: How local health can leverage Michigan's overdose surveillance system



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# What is MiCelerity?

- Real-time drug poisoning surveillance system
- Fatal and non-fatal suspected overdoses
- Managed by the Michigan Overdose Data to Action (MODA) Surveillance Team within MDHHS
- Utilizes mandatory reporting of drug poisoning events
- Innovative data capture from Admission, Discharge, and Transfer (ADT) messages
  - Can be expanded to other injury events and chronic diseases



# What data is captured in MiCelerity?

- Statewide
- Hospital emergency departments (primarily)
- Event-based system using diagnostic codes:
  - Drug poisonings (T36-T50);
  - Drug-related mental/behavioral disorders (F11-F16, F18-19);
  - Neonatal abstinence syndrome (P04);
  - Fetal alcohol syndrome (P96);
  - Events related to the toxic effect of alcohol (T51)
- Personally identifiable information for each event
  - Demographic and geographic information

# How does MiCelerity differ from other surveillance systems?

- Individually identifying information for overdose events
  - Patient-level linkage across events
  - Longitudinal assessment
- Assists provider compliance with overdose reporting
- Collects death certificate data
  - Data on both fatal and non-fatal suspected overdoses



# How can MiCelerity help my jurisdiction?

- Track trends
- Understand health disparities
- Target programmatic work
- Automated alerts

Local data to drive local decision-making

# What can be done in MiCelerity?

- View and track trends
  - NEW! Dashboard with aggregated visualizations
- Export search output in pdf or csv
  - Search by desired criteria (time, diagnosis, geographic area)
  - Save search criteria for future use
- Set up alerts
  - Create rules for generating alerts
  - Can be for specific jurisdictions, facilities, diagnosis codes, drug classes
  - Can be based on raw count or statistical aberration
- Share data for multijurisdictional monitoring



# Who can access MiCelerity?

- A. Local health department (LHD) personnel;
  - B. Healthcare providers from reporting facilities; or
  - C. MDHHS personnel
- 
- Users' work must be relevant to addressing the overdose crisis in Michigan
  - Limited to 3 users per LHD
  - Epidemiologists (if available) are prioritized

# MODA Public Dashboard

[Michigan.gov/OpioidsData](https://Michigan.gov/OpioidsData)

## Michigan Overdose Data to Action Dashboard

Home

Explore data

Current Trends

Reports

Technical Notes

Frequently Asked Questions

If you are in crisis, or know someone who needs help, contact the National Suicide Prevention Lifeline NOW at: 1-800-273-TALK (8255) [www.suicidepreventionlifeline.org](http://www.suicidepreventionlifeline.org)

[Click here](#) for information on programs and resources to prevent overdose and treat substance use disorder.

[View Monthly Comparison](#)

[View Disparities](#)

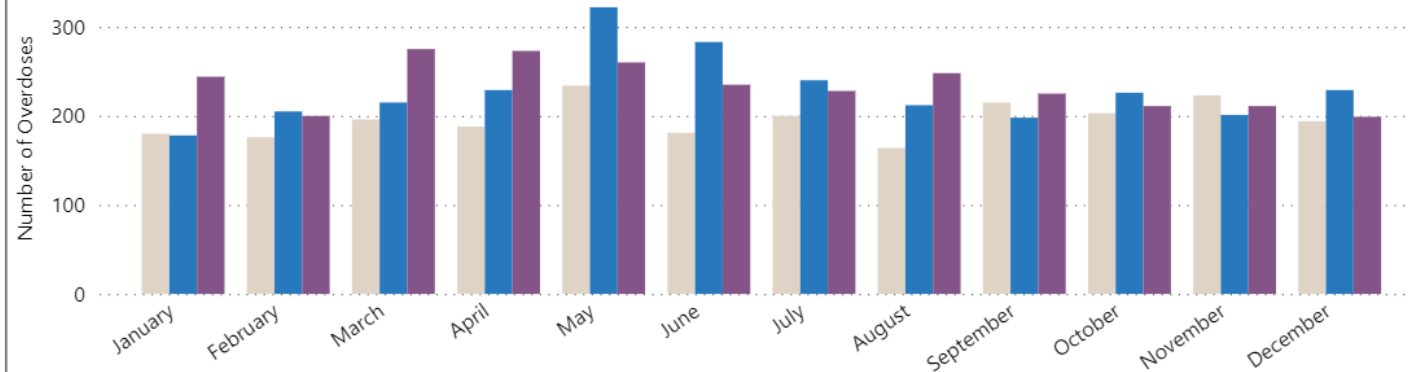
[\(?\) Helpful tips](#)

[View Death Data](#)

[View ED Data](#)

### Overdose Deaths in Michigan, Month-by-Month Comparison

Year ● 2019 ● 2020 ● 2021



### The Michigan Overdose Data to Action (MODA) Team

Please send questions about this dashboard to [MDHHS-MODAsurveillance@michigan.gov](mailto:MDHHS-MODAsurveillance@michigan.gov).

The Michigan Department of Health and Human Services (MDHHS) MODA team is funded by the Centers for Disease Control and Prevention (CDC) Overdose Data to Action (OD2A) grant to bring surveillance and prevention

### Monthly Comparison and Disparities Data

The charts above display the most recent overdose death and non-fatal emergency department (ED) data available compared to the previous year by month and data regarding disparities in fatal and non-fatal overdoses by race/ethnicity group in Michigan. On the disparities graph, NH stands for "non-

### Number of Overdose Deaths by Year

2,354  
2019

2,738  
2020

2,809  
January to December 2021



# MiCelerity Dashboard

**Filters:**

Select a Poisoning Classification  
0 Select

Select a Drug Class  
0 Select

Select a Jurisdiction  
0 Select

Select a County  
0 Select

Select Admission Date Range  
Last 30 Days

From Admission Date (mm/dd/yyyy)  
05/02/2022

To Admission Date (mm/dd/yyyy)  
06/01/2022

Select an Age Category  
0 Select

Select Sex  
0 Select

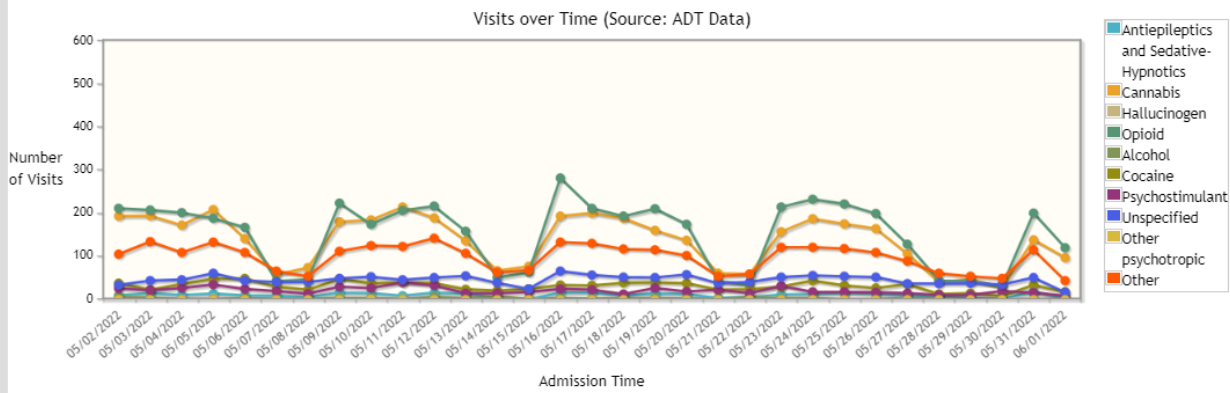
Select Race  
0 Select

Select Ethnicity  
0 Select

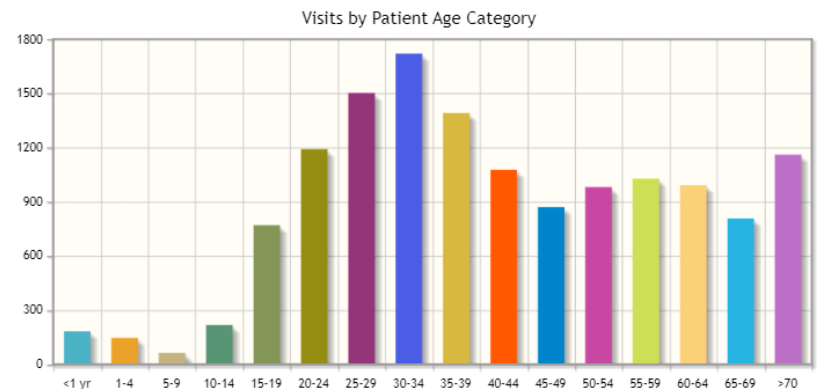
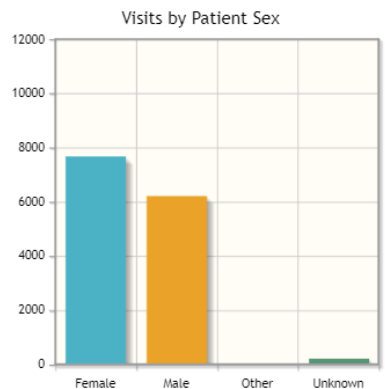
Apply Filters

Reset Filters

On average, MiCelerity receives data for 71% of diagnoses within 24 hours, 88% within 1 week, and 94% within 2 weeks. EDRS data will likely lag; the lag time is being explored and will be updated.



39 out of 15550 are missing admission date and not plotted on graph.



# Risk factors for experiencing multiple overdoses

Example analysis using MiCelerity data



# Goal for this analysis

- Are any groups of Michigan residents at an increased risk of experiencing a second suspected overdose?
  - Surviving a past overdose can increase a person's risk of overdosing\*
  - Provide insights for substance use prevention
- Provide framework to LHDs for similar analyses

# Data exported from MiCelerity



## Diagnosis Listing

Saved Search List: All Valid Visits Export

Displaying results 1-10 of 218172 found

Admission or Death Date	Source	Drug Class	Poisoning Classification	Patient Name	Facility	Jurisdiction	Visit ID	Visit Sequence	Diagnosis ID
From: 01/01/202	1 Select	0 Select	1 Select	First Name	0 Select	0 Select	Visit ID	Visit Sequen	Sort/Filter
To: 04/30/202				Last Name					Clear Filter



# Data cleaning procedure

- Probable drug poisonings
- Deduplicated by 1) Visit ID then 2) Patient ID
- Michigan residents in Michigan Emergency Departments
- Excluded deceased cases
- Created RepeatOD variable
  - RepeatOD = 1 → more than one overdose
  - RepeatOD = 0 → only one overdose recorded

# MiCelerity data for analysis

- 38,239 Michigan residents,
- accounting for 50,094 overdose events,
- between 01/01/2020 – 04/30/2022

**5,871 (15.3%) residents with repeat overdoses**

**32,368 (84.7%) residents with only one overdose**



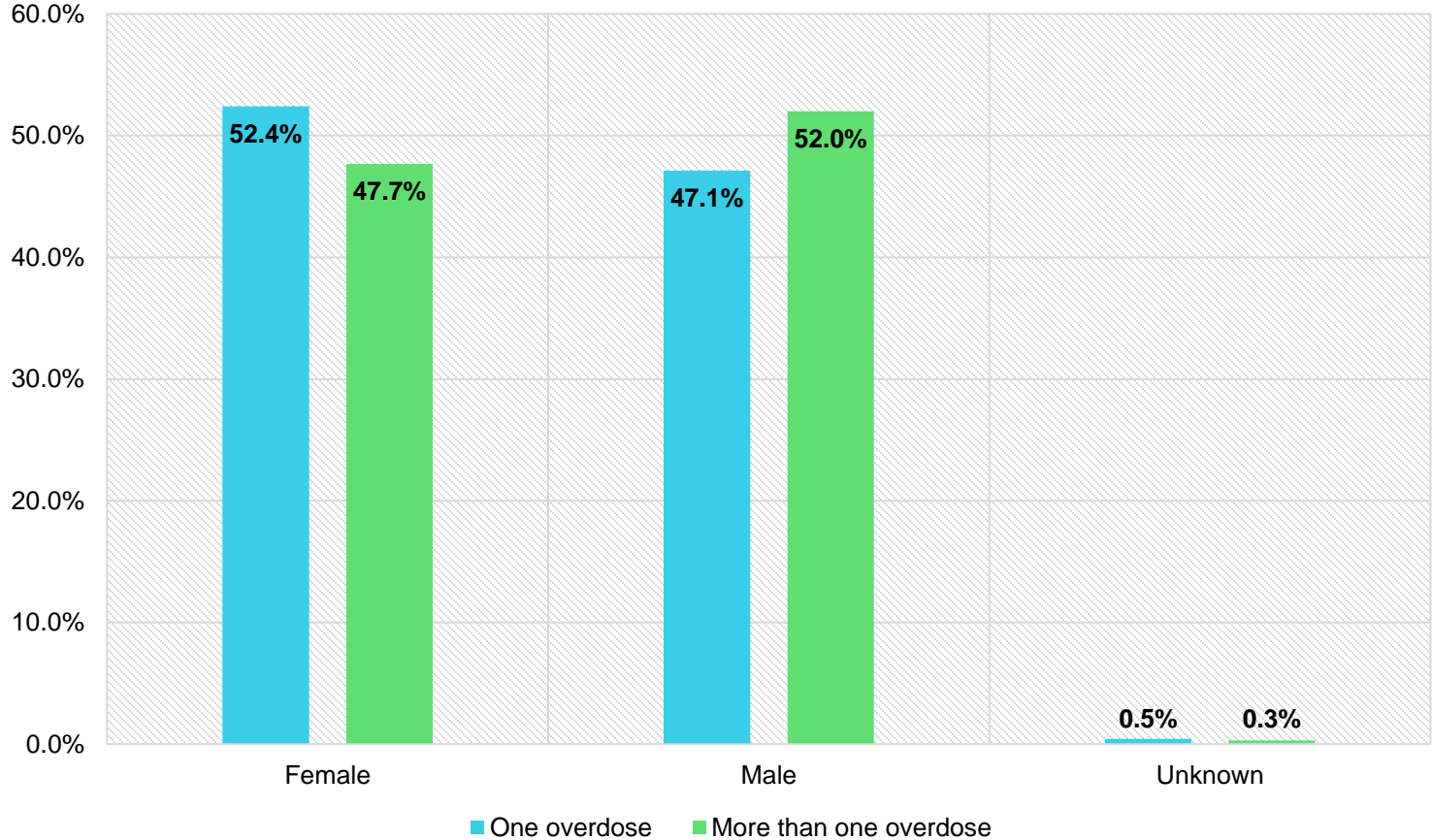
# Analysis procedure

**Outcome = experiencing more than one overdose**

1. Univariate logistic regression
2. Assessed multivariate model for:
  1. Collinearity
  2. Interaction
  3. Confounding
3. Present Odds Ratios from multivariate model  
Who is more likely to experience more than one overdose?

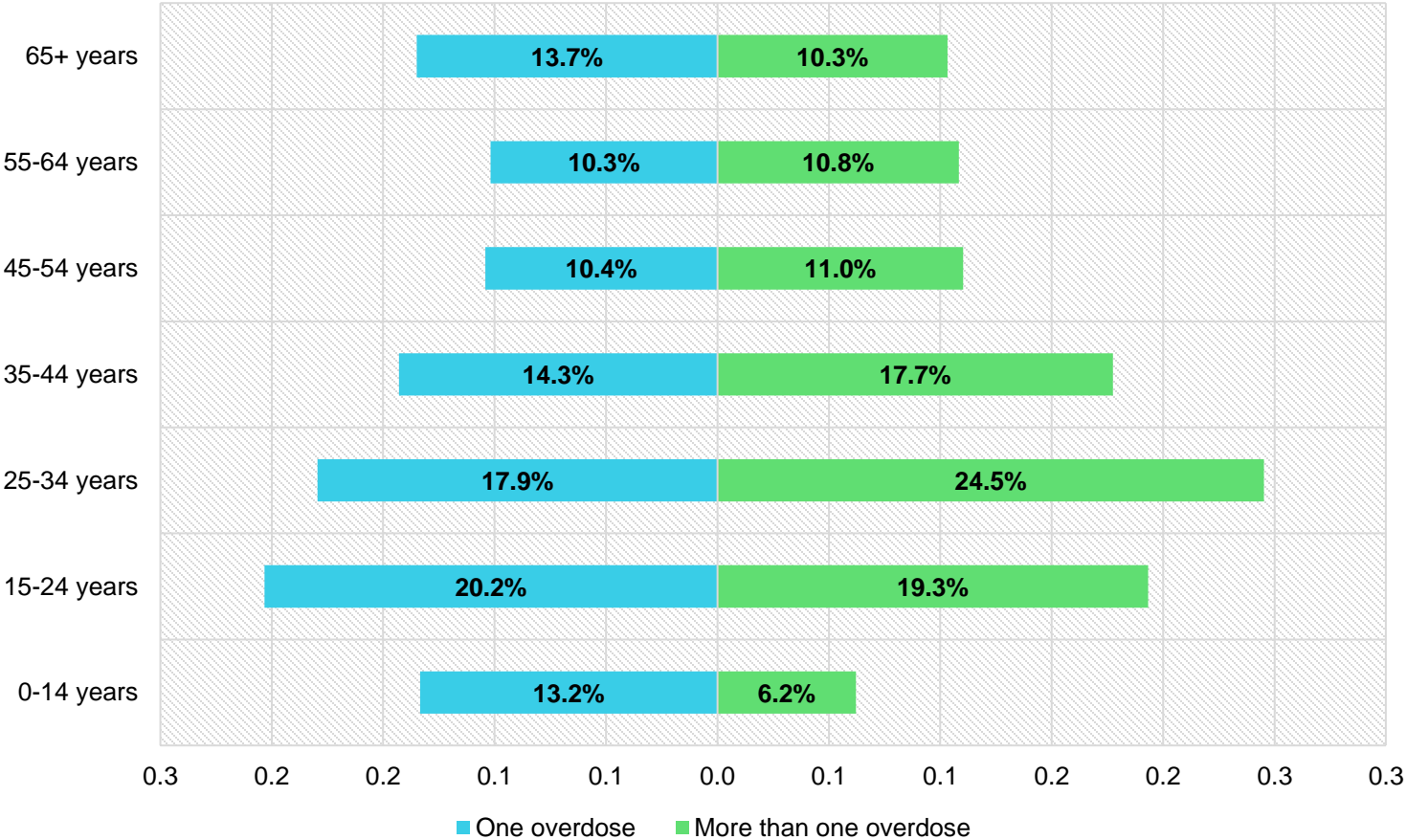
# Results

Michigan residents who experienced one or more than one suspected overdose by sex (January 2020 - April 2022)



# Results

Michigan residents who experienced one or more than one suspected overdose by age group (January 2020 - April 2022)

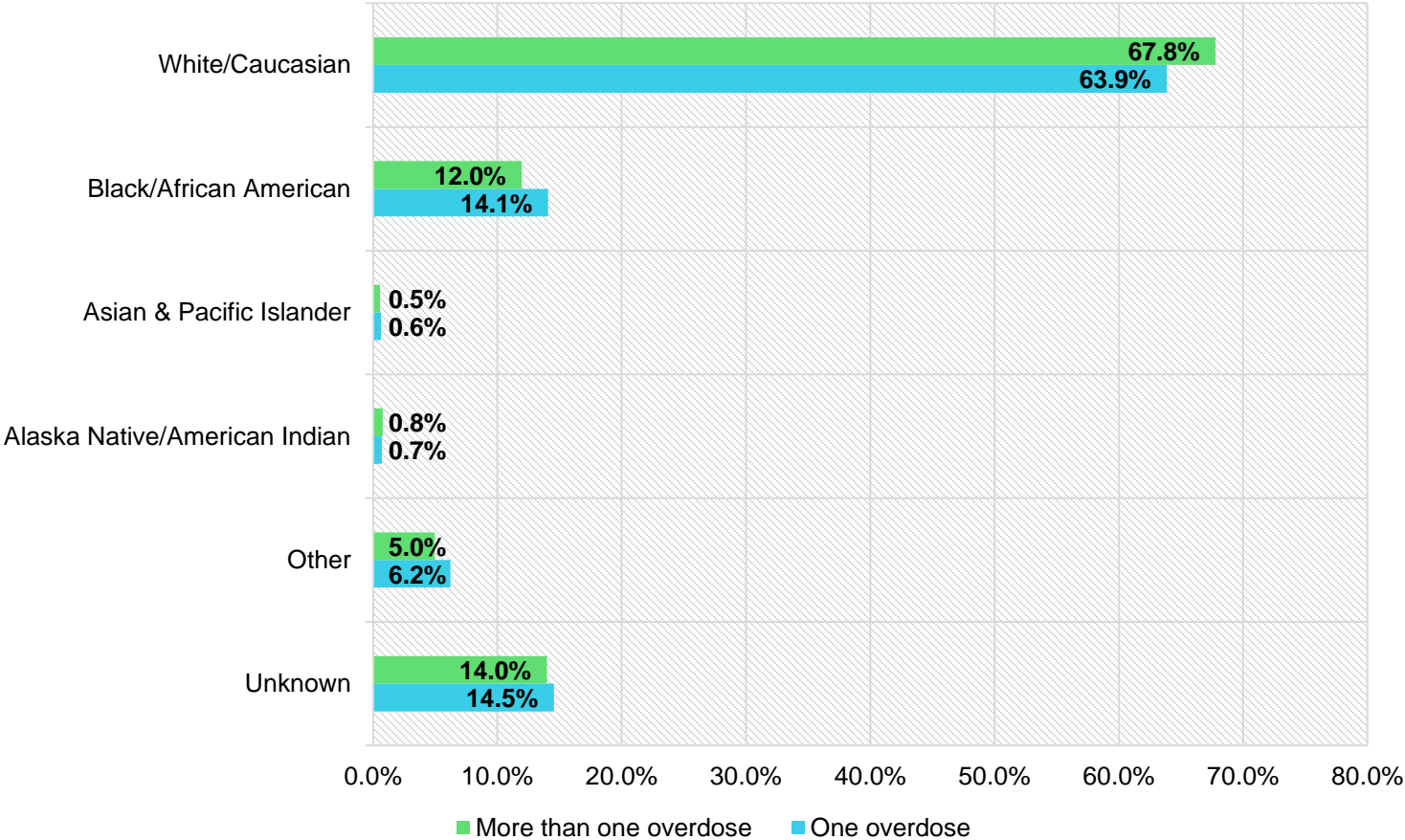


Median age: 34  
for both overdose  
categories



# Results

**Michigan residents who experienced one or more than one suspected overdose by race (January 2020 - April 2022)**



# Results

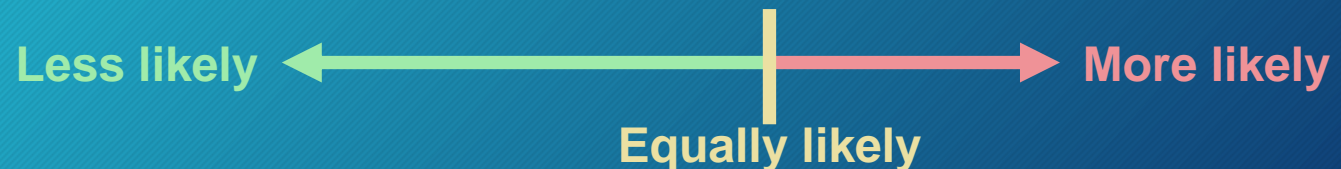
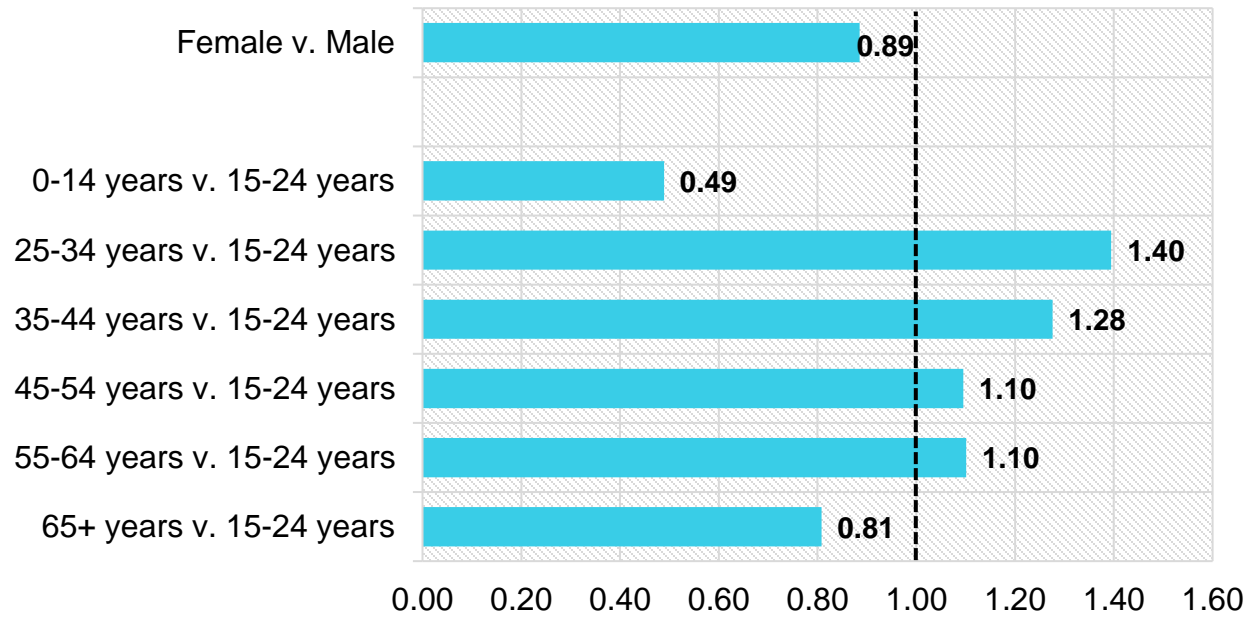
Univariate Regression Analysis of Experiencing More than One Suspected Overdose among Michigan Residents by Sex and Age Group (January 2020 - April 2022).

Variable	Odds Ratio (95% CI)	P-value
<b>Sex</b>		
Female*	-	-
Male	0.87 (0.82, 0.94)	<.0001
<b>Age groups (years)</b>		
0-14	0.48 (0.42, 0.56)	<.0001
15-24*	-	-
25-34	1.27 (1.14, 1.40)	<.0001
35-44	1.19 (1.07, 1.33)	0.0017
45-54	1.05 (0.93, 1.19)	0.4044
55-64	1.05 (0.93, 1.19)	0.4369
65+	0.79 (0.69, 0.89)	0.0002
<b>Race</b>		
White/Caucasian*	-	-
Black/African American	0.85 (0.76, 0.94)	0.0011
Asian & Pacific Islander	0.98 (0.63, 1.53)	0.9348
American Indian/Alaska Native	1.10 (0.79, 1.54)	0.5705
Other	0.84 (0.71, 1.00)	0.0530
<b>Ethnicity</b>		
Non-Hispanic*	-	-
Hispanic	0.98 (0.81, 1.19)	0.8672

\*Reference group

# Results

**Odds Ratios of Experiencing More than One Suspected Overdose among Michigan Residents by Sex and Age Group (January 2020 - April 2022).**





# Conclusions

Those who are more likely to experience more than one overdose:

- Males
  - vs females
- Cases 15-64 years old
  - vs younger cases (0-14 years old) and older cases (65+ years old)
  - Age group 15-34 years old are most likely
    - Followed by those 35-44 years old

*\*All statistically significant at alpha level 0.05*

# Limitations to this analysis

- Years available in MiCelerity
  - January 2020 – Present
- Missing race/ethnicity data
  - 5,580 (14.4%) cases had an unknown race
  - 10,258 (26.6%) cases had an unknown ethnicity
- Model was limited to variables included in the data set
- Fatal overdoses were not included



# Next steps for this analysis

- Share analysis code with LHD MiCelerity users
  - Jurisdiction-specific analyses
  - Available for SAS and R
- Incorporate fatal overdose events using EDRS data
  - Who is more likely to experience a fatal overdose?
  - How do the risk factors for a second overdose compare to the risk factors for a fatal overdose?
- Time-to-event analysis using fatal overdose data



# Next steps for MiCelerity

- Insurance data for each suspected overdose
  - Retrospective data available back to April 2022
- Exploring possible data linkages:
  - EMS data (BioSpatial)
  - Data on housing and homelessness
  - Medicaid data
- Meeting with LHD users for collaboration
  - Next quarterly meeting is July 22<sup>nd</sup>

Any questions?

# Thank you!

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Please contact  
[MDHHS-MODASurveillance@Michigan.gov](mailto:MDHHS-MODASurveillance@Michigan.gov)  
if you would like access to MiCelerity

