Opioid agonist treatment and fatal overdose risk in a statewide population receiving opioid use disorder services

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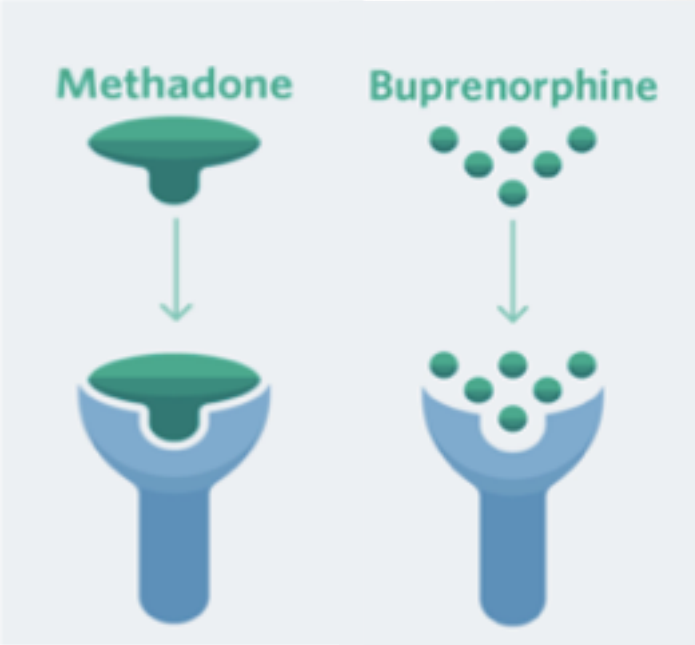
Introduction

Opioid agonists: Gold standard but *not the* standard

- **Opioid agonist treatment (OAT) medications considered gold standard of care for OUD**

- Yet, many barriers to accessing OAT
  - Regulatory and financial hurdles
  - Shortage of trained providers
  - Stigma against medications



- **Most who seek care for OUD in the U.S. receive therapy without medications**
  - Less than 40% of treatment admissions for OUD involves OAT
  - Less than 40% of substance use treatment facilities offer medications

What is the impact of lack of OAT on population overdose risk?

We know from cohort studies that OAT reduces overdose compared to no treatment at all

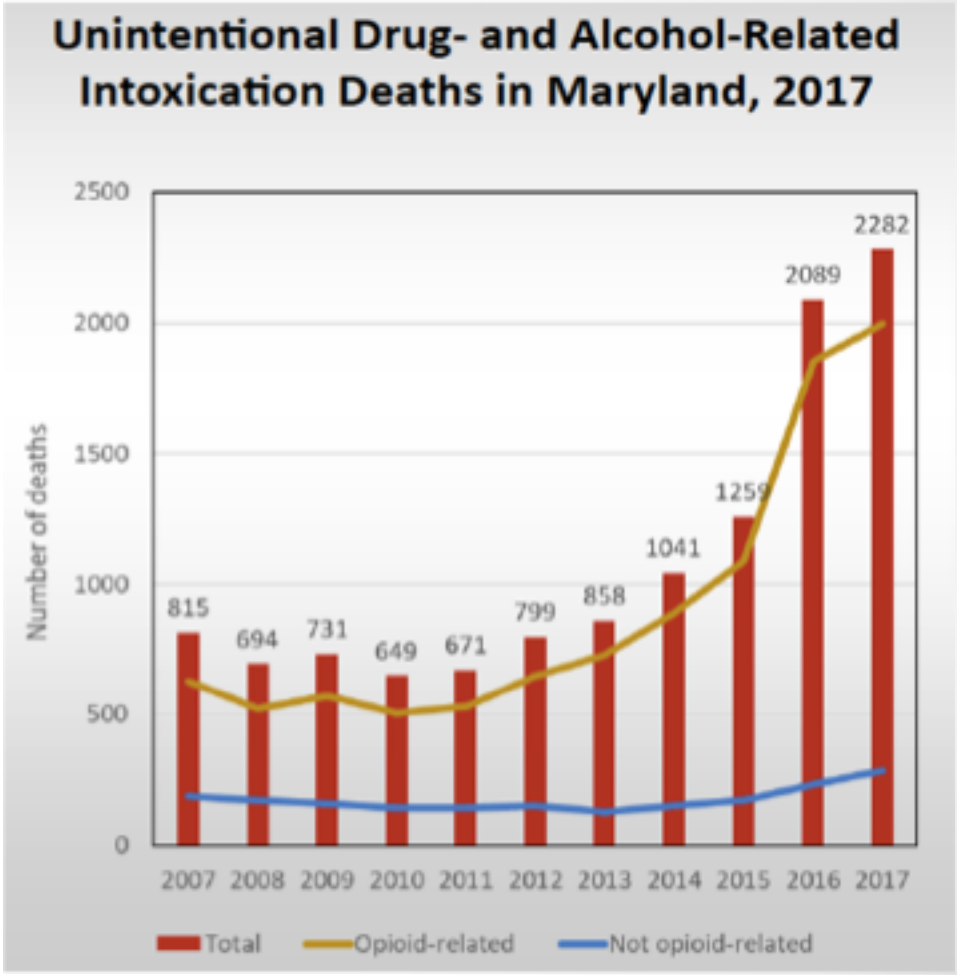
We don't know how OAT impacts overdose risk compared to non-medication behavioral treatments delivered in usual care

Study Objective

Maryland: A population-based study

- Maryland has 8th highest overdose rate in the U.S.
- Partnered with Maryland Department of Health to link treatment and mortality data in Maryland

MARYLAND Department of Health



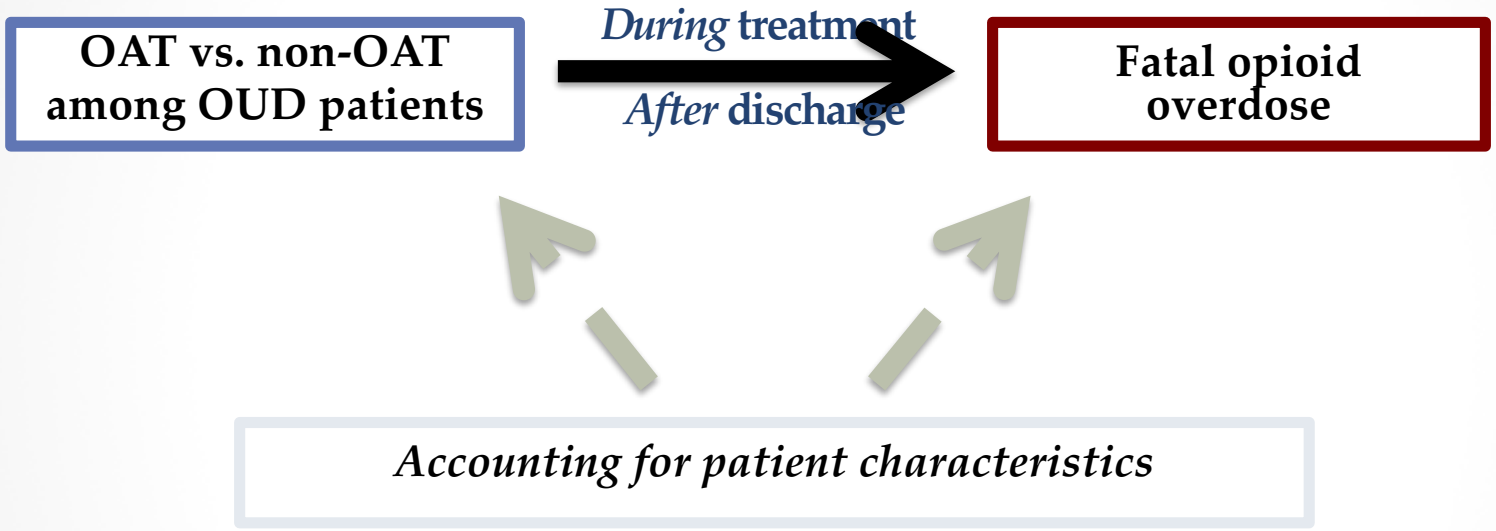
Data and Methods

Linked Maryland Datasets 2015-16

- **Treatment data** for outpatient OUD claims in specialty programs with public funding (n=48,274 patients)
  - **OAT:** involving methadone or buprenorphine
  - **Non-OAT:** intensive/non-intensive outpatient, detox, partial hosp.
- **Buprenorphine prescription data** used to exclude patients receiving external office-based OAT receipt
- **Hospital data** for additional demographic information
- **Mortality data** of medical examiner-investigated opioid overdoses

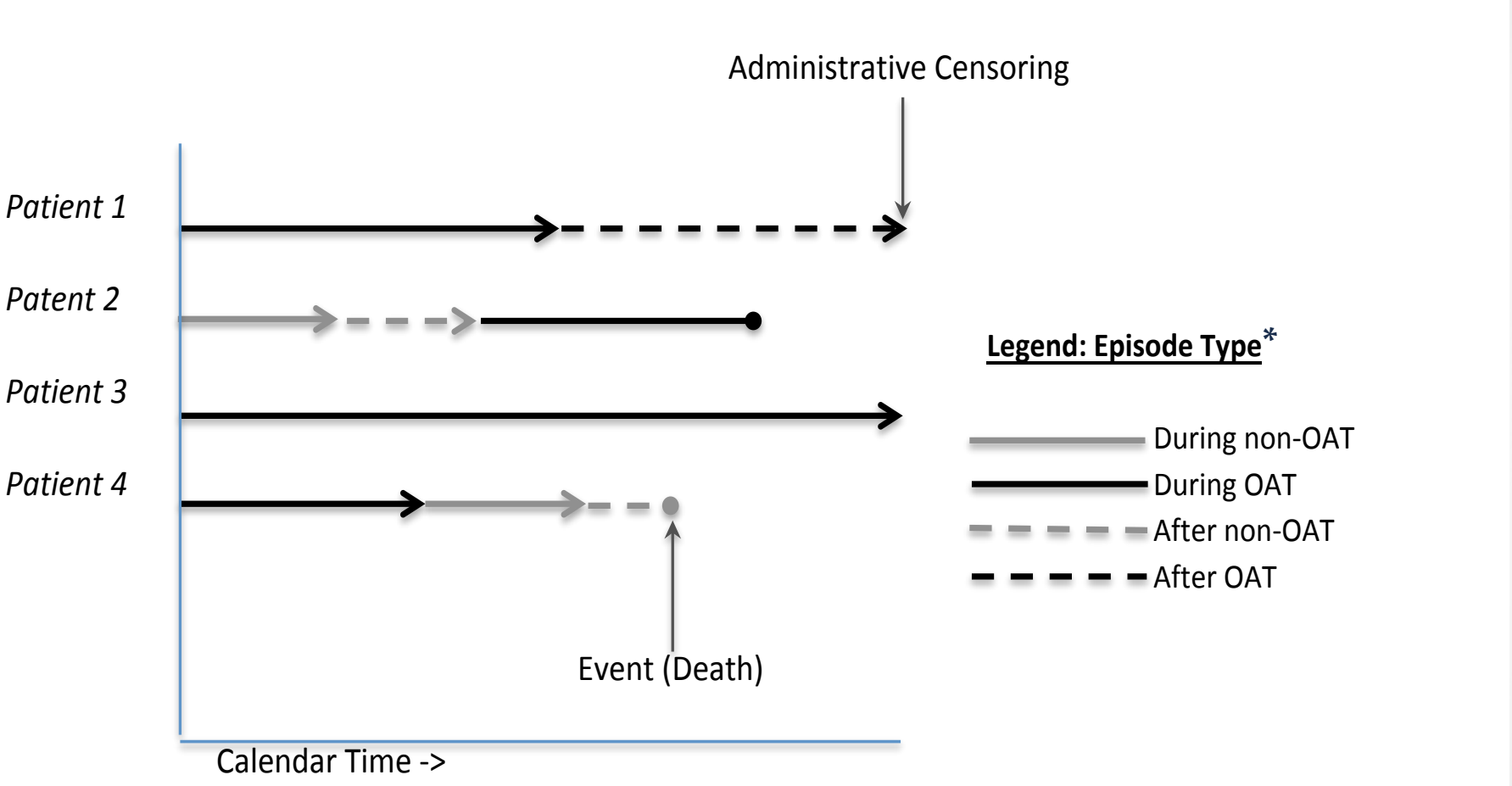
Analyses

- **Survival analysis** using Cox proportional hazards regression to compare hazard of overdose death in periods **during** and **after** OAT vs. non-OAT)



- **Propensity score inverse probability of treatment weights (IPTW)** to control for differential characteristics in OAT vs. non-OAT groups
  "Pseudo-randomization"

Hypothetical Patients Moving Through Episode Risk Sets, 2015-2016



*Treatment episode indicates continuous service claims with no more than 14 day break

Findings

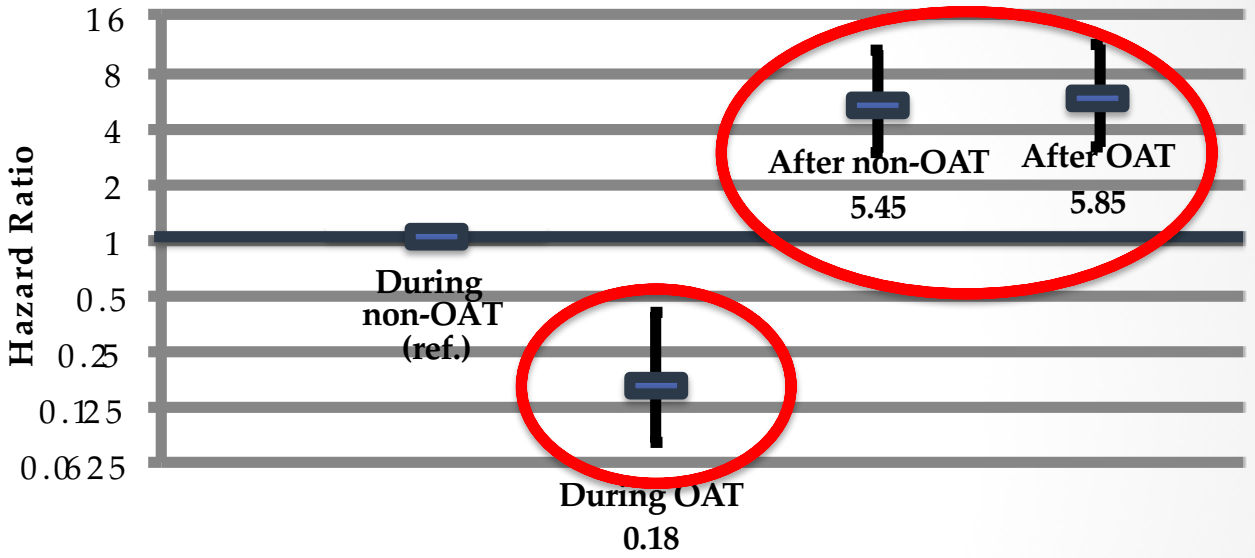
Patient Episodes for Opioid Use Treatment in Maryland 2015-2016

Number of Patients	**48,274**
OAT only	49.70%
Non-OAT only	27.96%
Both OAT and non-OAT	22.34%
Number of Follow-Up Episodes	**185,568**
Average Days in Follow up Episode	**123**
During non-OAT	22
During OAT	248
After non-OAT	11
After OAT	79 days
Opioid Overdose Deaths	**371**
Prescription opioids	35.04%
Methadone	30.73%
Heroin	64.96%
Fentanyl	57.41%

	Crude (Unweighted) data (%)			Weighted Data (%)
Patient Characteristics	**Non-OAT**	**OAT**	**Difference in Unweighted Column Proportions**	**Difference in Weighted Column Proportions**
Male Sex	58.2	52.9	**5.2**	**0.2**
Age Group				
18-25	14.4	6.4	**8.0**	**0.1**
26-35	40.3	31.4	**8.9**	**0.04**
36-45	19.5	22.7	**3.2**	**0.4**
46-55	18.6	25.9	**7.2**	**0.1**
56-65	6.8	12.3	**5.5**	**0.3**
66 and over	0.4	1.5	**1.0**	**0.1**
Race				
White	65.8	60.9	**4.9**	**0.3**
Black	32.3	37.7	**5.3**	**0.3**
Other	1.9	1.5	**0.5**	**0.0**
Region of Residence				
Baltimore Metro	59.0	76.2	**17.3**	**2.9**
Eastern Shore	18.9	9.8	**9.2**	**1.7**
Southern	5.1	1.3	**3.8**	**0.86**
National Capital	2.5	1.3	**1.1**	**0.4**
Northwest	14.5	11.3	**3.2**	**0.04**
Married	11.4	15.1	**3.7**	**0.07**
Employed	46.4	47.1	**0.6**	**0.08**
Veteran	2.9	2.9	**0.04**	**0.02**
Homeless	30.9	17.4	**13.5**	**1.3**
Primary Heroin	77.4	90.3	**12.9**	**1.5**
Mental Health Treatment	66.0	49.7	**16.3**	**0.5**
Past Year Arrest	22.7	11.9	**10.8**	**0.7**
Criminal Justice Referral	41.2	11.3	**29.9**	**0.5**

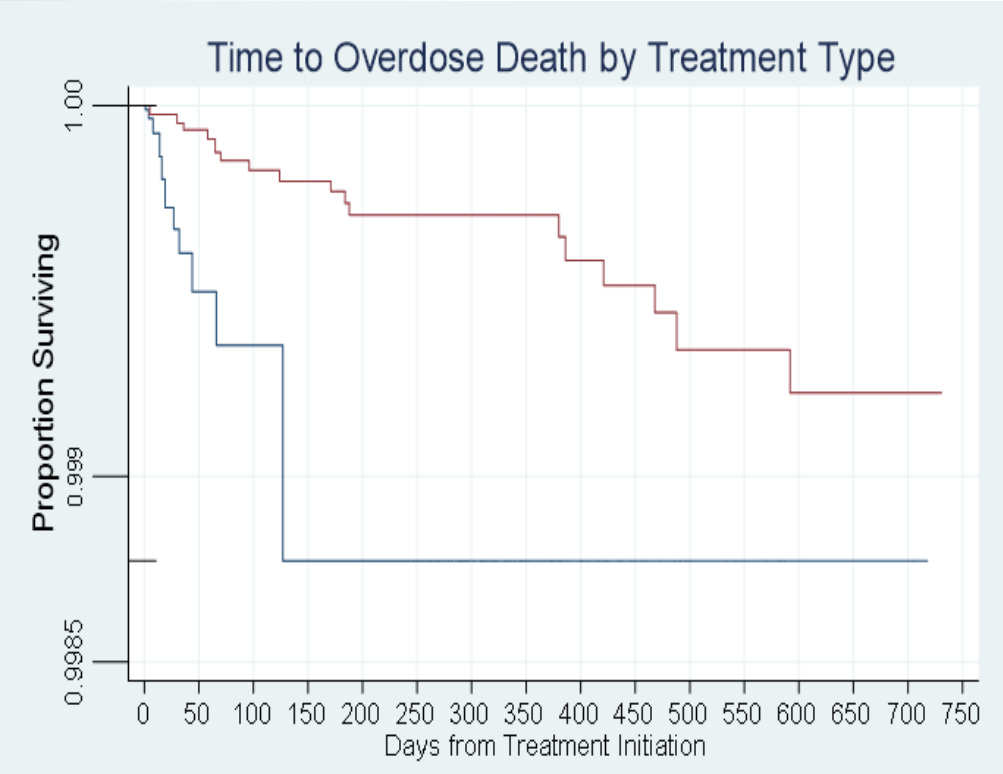
Adjusted hazard ratios for opioid overdose death among patients in OUD treatment

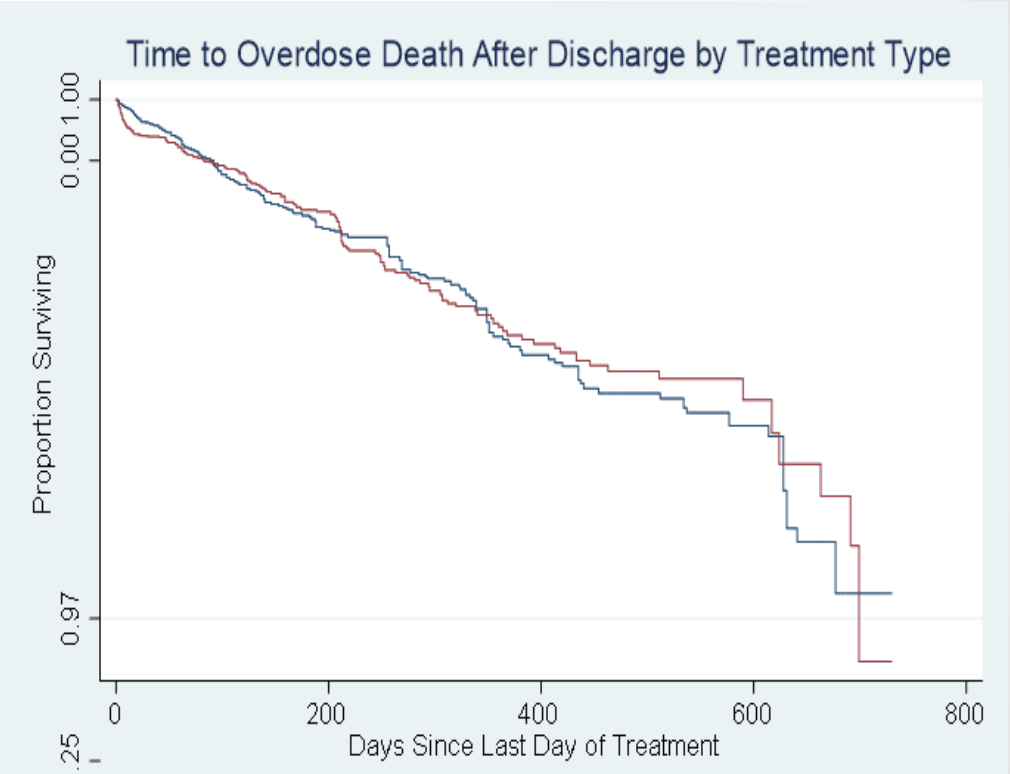
- Periods in OAT ↓ hazard compared to non-OAT
- Periods after OAT and non-OAT cessation had equally ↑ hazard compared to periods during non-OAT



Episode Type	During non-OAT	During OAT	After non-OAT	After OAT
Person years	2664	37371	12251	10458
Overdose deaths	11	18	162	180
Overdose death rate per 1000 person-years	4.13	0.48	13.22	17.21

Adjusted Kaplan-Meier survival curves for opioid overdose death, during treatment (left) and after discharge (right)





Non-OAT OAT

Summary & Conclusions

Being in OAT substantially reduces risk of overdose death compared to non-medication treatments

Despite gold standard, a significant proportion (and especially certain groups) still not receiving OAT

OAT associated with longer treatment retention, but is no longer protective once care is discontinued: Retention is critical

Efforts should focus on expanding engagement & continuation in OAT, coupling treatments with strategies to reduce overdose risk

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  - Office of the Chief Medical Examiner
  - Health Services Cost Review Commission
  - Prescription Drug Monitoring Program

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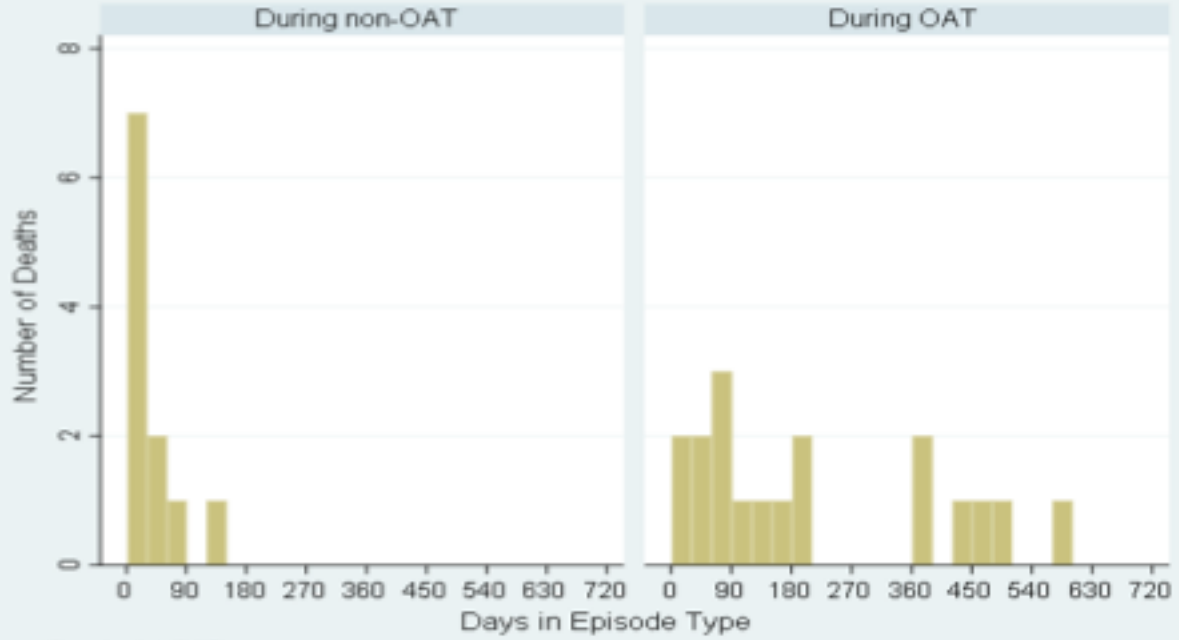
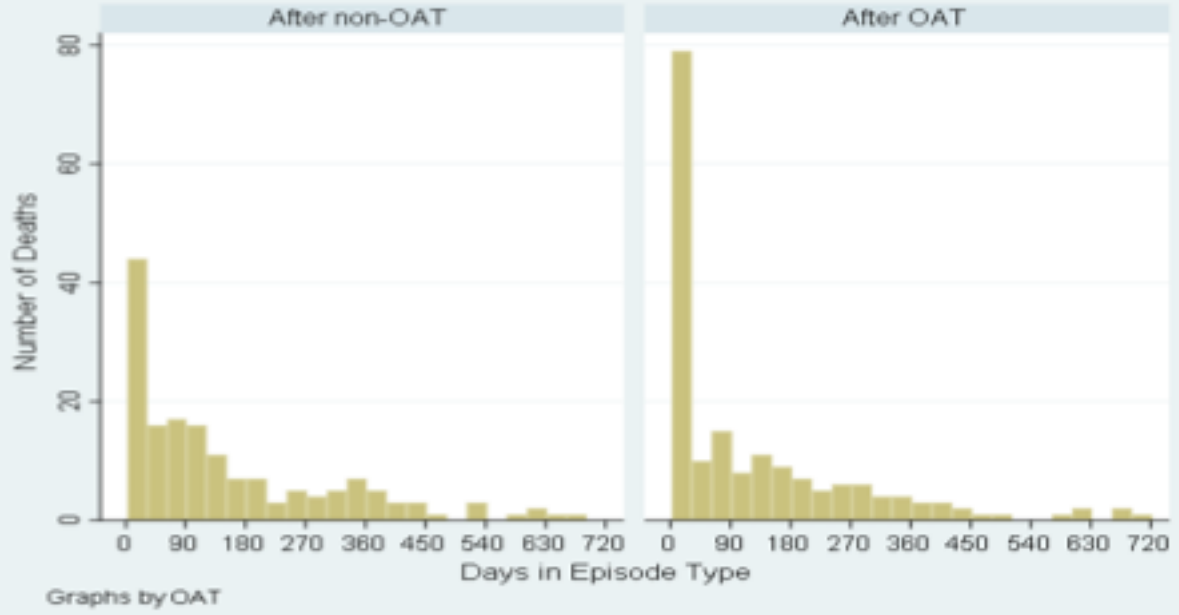

During non-OAT
During OAT
Number of Deaths
0
2
4
6
8
0 90 180 270 360 450 540 630 720
Days in Episode Type


After non-OAT
After OAT
Number of Deaths
0
20
40
60
80
0 90 180 270 360 450 540 630 720
Days in Episode Type
Graphs by OAT