



2016 Drug Overdose Hospital Discharges in Tennessee

**Tennessee Department of Health
Office of Informatics and Analytics**

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This report was prepared pursuant to TCA 68-1-108(f)

Executive Summary

This report describes hospital discharges related to drug overdoses in Tennessee (TN) from 2012 to 2016 using data from the TN Hospital Discharge Data System. In addition to summarizing the overall rates of inpatient and outpatient hospital discharges due to drug overdoses, this report describes overdoses by sex, race, and age. The rate of opioid deaths continues to increase in TN (15.9 and 18.1 per 100,000 residents in 2015 and 2016, respectively). It is important to note, however, that the number and rate of non-fatal drug overdoses is much higher than for deaths. While there has been a decline in the rate of non-fatal overdoses for all drugs combined, this pattern is not consistent across all drug categories with alarming increases in non-fatal **opioid** overdoses, described in detail in this report.

Non-fatal all drug overdoses declined but coding change complicates interpretation

- In 2016, there were 18,459 drug overdose hospital discharges among TN residents. Of these, 6,180 (33.5%) were inpatient stays and 12,279 (66.5%) were outpatient visits.
- The rate of drug overdoses due to any drug declined slightly in 2016 compared to 2015. The rate of overdose outpatient visits dropped from 203.61 in 2015 to 191.4 in 2016 (a 6% decrease), and the rate of overdose inpatient stays dropped from 103.4 in 2015 to 90.6 in 2016 (a 12% decrease).
- Women continued to have higher rates of outpatient and inpatient hospitalizations than men. Rates of hospitalizations were higher for Whites than Blacks. Young people had the highest rates of all drug overdose outpatient visits, particularly among those aged 15 to 24 years.
- Although the 2016 rate is an apparent decrease from previous years, this may be due to the mandatory changeover from ICD-9-CM diagnosis codes to ICD-10-CM diagnosis codes beginning October 1, 2015. As such, any conclusions about trends in overdose discharges remain speculative. Work is ongoing nationally and within the TN Department of Health to determine the most comprehensive way to identify drug overdoses using ICD-10-CM codes.

Non-fatal opioid overdoses (excluding heroin) are increasingly likely to be treated in an outpatient setting

- From 2012-2014, opioid overdose patients were most commonly discharged after inpatient stays. In 2016, the rate of outpatient visits was about 33% higher than the rate for inpatient stays.
- The increase in outpatient stays was observed for men and women and across most age categories. While older adults (≥ 45 years) had the highest rates of opioid overdose and tended to be treated in inpatient care, there was a rapid increase in opioid overdose outpatient visits among the 25-34 year-old group (28.9 in 2015 to 43.5 in 2016).

Non-fatal heroin overdoses are rapidly increasing

- Between 2012 and 2016, the age-adjusted rate of heroin outpatient visits increased from 2.3 to 21.1 (an 817% increase). Increases were seen among both Whites and Blacks.
- The increase in non-fatal heroin overdoses parallels the increase in fatal heroin overdoses during the same period. The rate of heroin overdose deaths was 0.7 in 2012 and increased to 4.1 in 2016.

¹ All rates in this report are age-adjusted and per 100,000 residents unless otherwise specified.

Introduction

The purpose of this report is to describe drug overdose hospital discharges in the State of Tennessee (TN) in 2016. This report meets the legislative requirement to summarize aggregate claims data on all inpatient and outpatient discharges that include a drug poisoning diagnosis as reported for the calendar year two years prior to the current year by licensed hospitals (TCA §68-1-108(f)).² Data presented here are from the TN Hospital Discharge Data System (HDDS) from 2012 to 2016. The HDDS contains billing codes from discharges at hospitals statewide that includes information on inpatient hospitalizations and outpatient visits. These billing codes are based on the International Classification of Diseases, Ninth and Tenth Revisions, Clinical Modification (ICD-9-CM and ICD-10-CM) and provide a standardized method for identification of drug overdoses.

From 2012 through the third quarter of 2015, the TN HDDS used the ninth revision of these codes (ICD-9-CM). Beginning October 1, 2015, hospitals began reporting using the tenth revision (ICD-10-CM). The coding change from ICD-9-CM to ICD-10-CM involved substantial changes. For example, ICD-9-CM included 2,600 injury diagnosis codes and 1,300 external cause of injury codes compared to 43,000 injury diagnosis codes and 7,500 external cause of injury codes in ICD-10-CM.³ The coding change has been shown to influence opioid-related measures based on hospital discharge data⁴ and it is important to consider this in the interpretation of trends before and after the coding change implementation. Prescription Drug Overdose analytics team members are actively participating in a national workgroup that is conducting analyses by US jurisdiction to determine optimal approaches for defining opioid-related indicators using ICD-10-CM data.

The current report includes discharges for TN residents at non-federal, acute care hospitals for four primary drug overdose morbidity statistics:

- (1) **All drug overdose outpatient visits or inpatient stays** – caused by non-fatal acute poisonings due to the effects of drugs, regardless of intent (e.g., suicide, unintentional, or undetermined).
- (2) **Opioid overdose excluding heroin outpatient visits or inpatient stays** – caused by non-fatal acute poisonings due to the effects of all opioids drugs, excluding heroin, regardless of intent (e.g., suicide, unintentional, or undetermined).
- (3) **Heroin overdose outpatient visits or inpatient stays** – caused by non-fatal acute poisonings due to the effects of heroin, regardless of intent (e.g., suicide, unintentional, or undetermined).
- (4) **Fatal and non-fatal overdose trends** – caused by poisonings due to the effects of drugs, regardless of intent (e.g., suicide, unintentional, or undetermined).

Events related to late effects, adverse effects, and chronic poisonings due to the effects of drugs (e.g., damage to organs from long-term drug use), are excluded. Unless otherwise indicated, data exclude records with discharge status of deceased.

² https://www.tn.gov/content/dam/tn/health/documents/HDDS_User_Manual_Final_2017.pdf

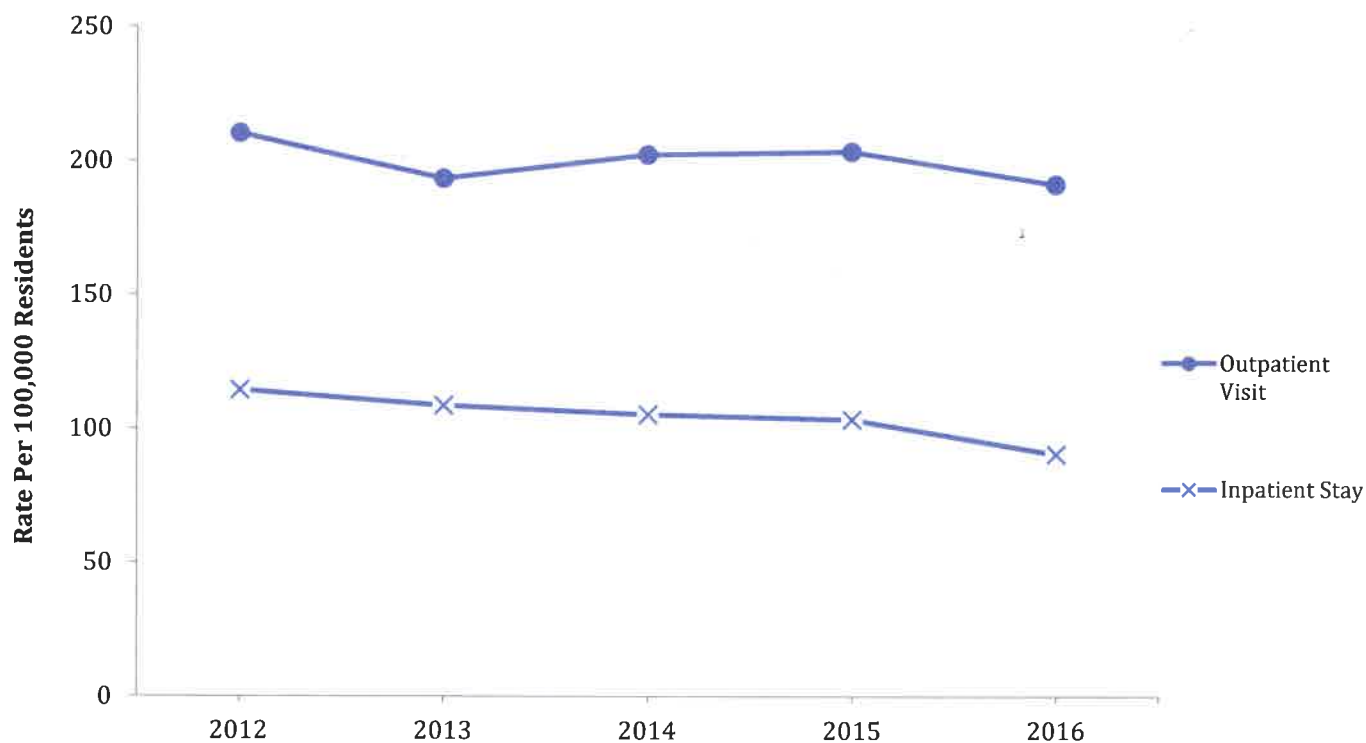
³ The Transition from ICD-9-CM to ICD-10-CM: Guidance for Analysis and Reporting of Injuries by Mechanism and Intent. A report from the Injury Surveillance Workgroup (ISW9) Safe States Alliance. December 2016.

⁴ Heslin KC, Owens PL, Karaca Z, Barrett ML, Moore BJ, Elixhauser A. Trends in Opioid-related Inpatient Stays Shifted After the US transitioned to ICD-10-CM Diagnosis Coding in 2015. *Med Care*. 2017 Nov;55(11):918-923.

Non-Fatal Drug Overdose Hospital Discharges in Tennessee, 2012-2016

All Drug Overdose Hospital Discharges

Age-Adjusted Rates for All Drug Overdose Outpatient Visits and Inpatient Stays in TN, 2012-2016



Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2017). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

In 2016, there were 18,459 non-fatal⁵ drug overdose hospital discharges among TN residents. This total comprises 6,180 inpatient stays (33.5%) and 12,279 outpatient visits (66.5%). The above graph shows age-adjusted rates for all drug overdose⁶ outpatient visits and inpatient stays in TN during 2012 to 2016. For outpatient visits,⁷ the age-adjusted rates decreased slightly and ranged from 210.3 per 100,000 in 2012 to 191.4 per 100,000 in 2016. For inpatient stays, the age-adjusted rates decreased from 114.5 per 100,000 in 2012 to 90.6 per 100,000 in 2016.

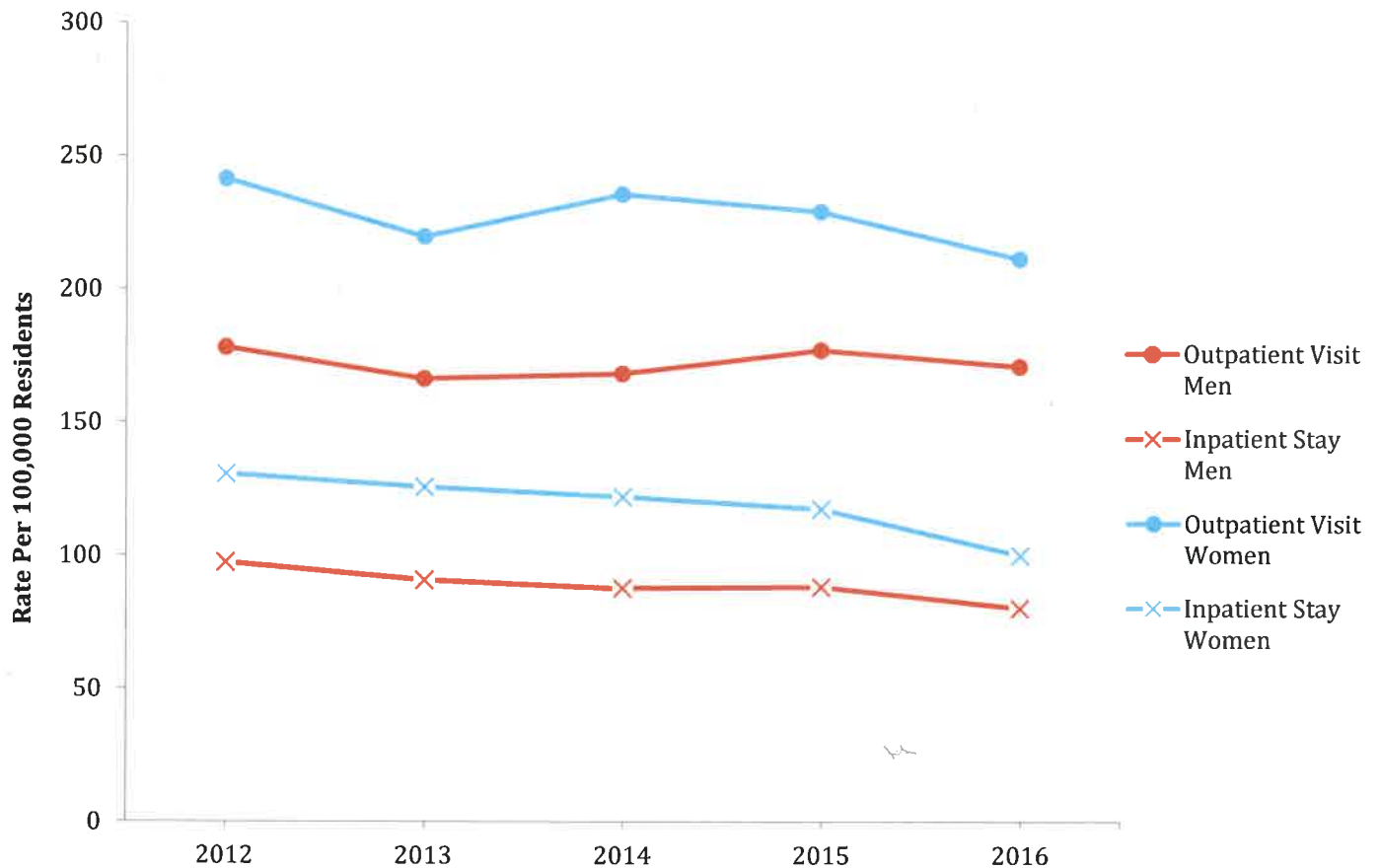
⁵ This number does not include 143 TN residents (127 inpatient, 16 outpatient) who died of a drug overdose in hospital.

⁶ All drug overdose outpatient visits and inpatient stays are defined as drug overdoses caused by non-fatal acute poisonings due to the effects of drugs, regardless of intent (e.g., suicide, unintentional, or undetermined).

⁷ Hospital discharge data are often classified according to type of hospital stay, regardless of how the patient was admitted to the hospital. Inpatient hospitalizations make up less than 20% of all discharges and over half of these stays involved a trip to the ER. Outpatient visits include primarily emergency department visits, but also include any observation 23 hours or less, ambulatory surgeries or certain diagnostic services (such as MRIs or CT scans).

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for All Drug Overdose Outpatient Visits and Inpatient Stays by Sex in TN, 2012-2016

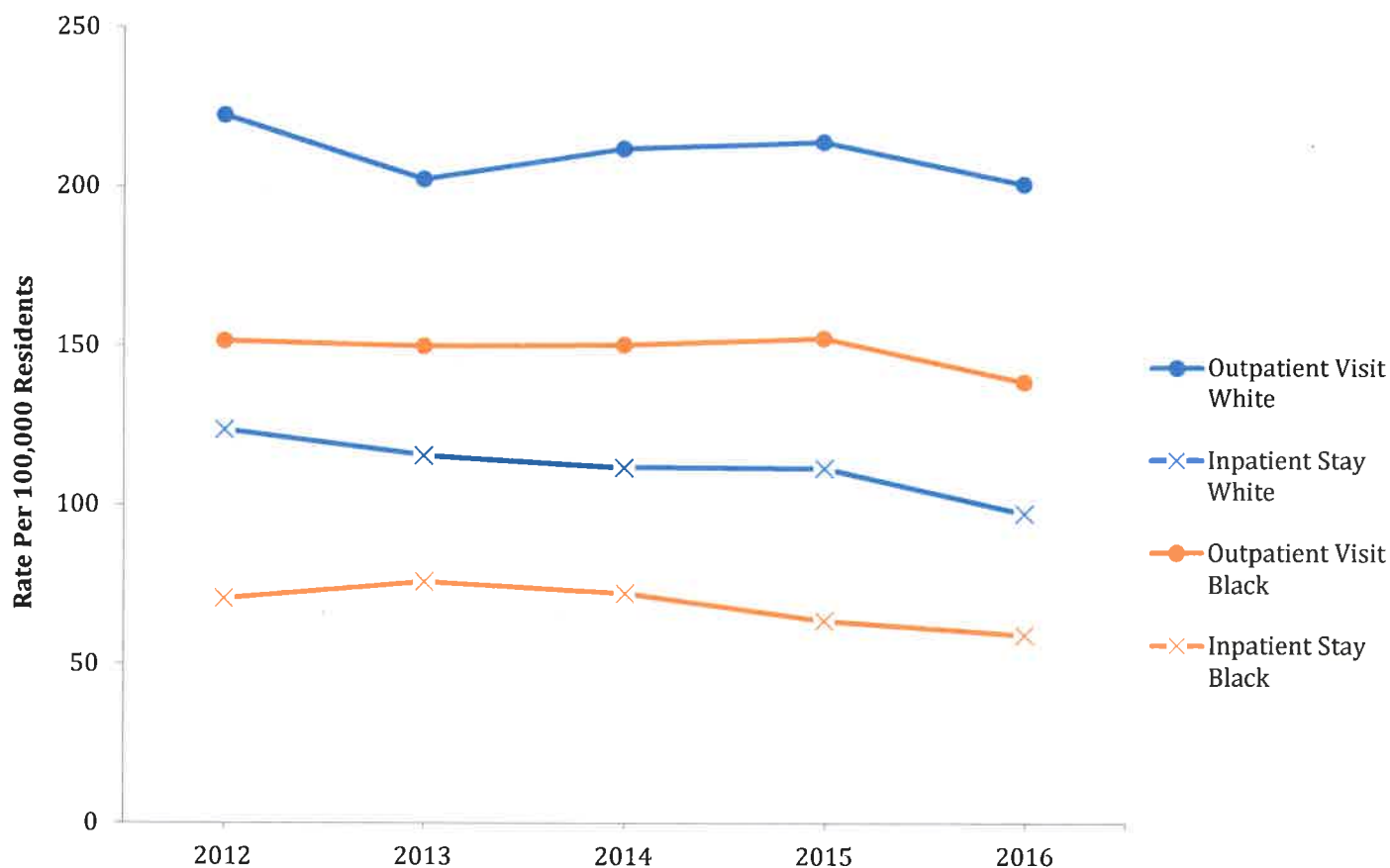


Analysis by Office of Informatics and Analytics, TDH (last updated February 23, 2017). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

In 2016, women accounted for 10,430 (56.5%) of all drug overdose hospital discharges compared to 8,029 (43.5%) for men. Outpatient visits were the most common type of discharge for both women (6,884) and men (5,395). The figure above shows that these sex differences have remained stable from 2012 to 2016. Rates (per 100,000 TN residents) for outpatient visits for women have decreased from 241.5 in 2012 to 211.5 in 2016. Among men, this rate has not changed much from 178.3 in 2012 to 171.1 in 2016. Rates (per 100,000 TN residents) for inpatient stays for women and men have decreased slightly from 130.7 in 2012 to 100.2 in 2016 for women and from 97.6 in 2012 to 80.2 in 2016 for men.

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for All Drug Overdose Outpatient Visits and Inpatient Stays by Race in TN, 2012-2016



Analysis by Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

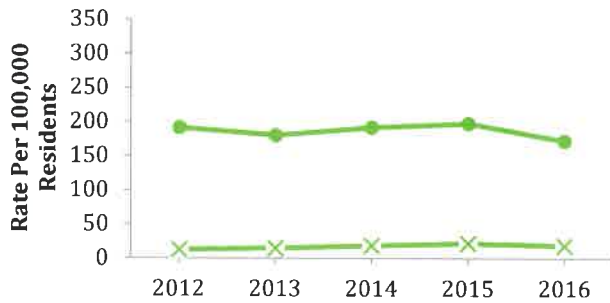
In 2016, Whites accounted for 15,425 (83.6%) of all drug overdose hospital discharges, Blacks made up 2,381(12.9%), and other or unknown races accounted for the remaining 653 (3.5%). Outpatient visits were the most common type of discharge for both Whites (10,107) and Blacks (1,690). The graph above shows trends from 2012 to 2016 for White and Black patients. These trends have remained relatively stable from 2012 to 2016. Rates (per 100,000 TN residents) for outpatient visits for Whites have decreased from 222.5 in 2012 to 200.9 in 2016. Among Blacks, the rate decreased from 151.6 in 2012 to 138.8 in 2016. Rates (per 100,000 TN residents) for inpatient stays for Whites and Blacks have decreased from 123.6 in 2012 to 97.4 in 2016 for Whites and from 70.7 in 2012 to 59.1 in 2016 for Blacks.

2016 Drug Overdose Hospital Discharges in Tennessee

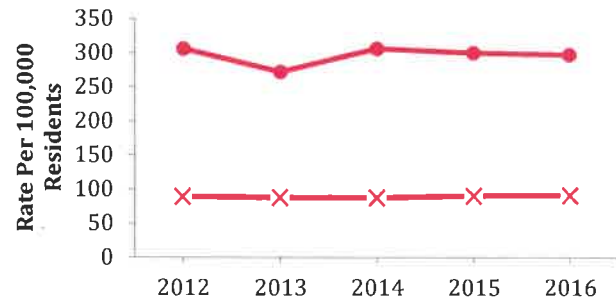
Age-Specific Rates for All Drug Overdose Outpatient Visits and Inpatient Stays by Age in TN, 2012-2016

For all graphs, '•' refers to outpatient visits and 'x' refers to inpatient stays

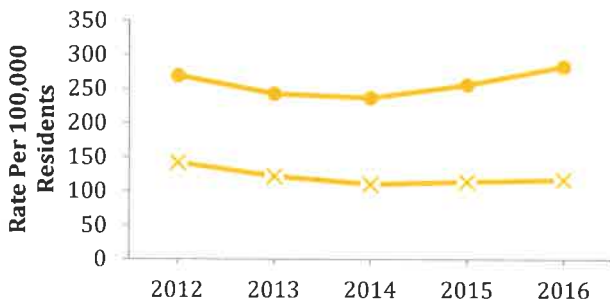
0-14 Years



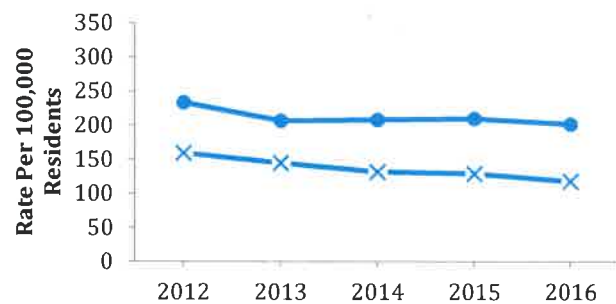
15-24 Years



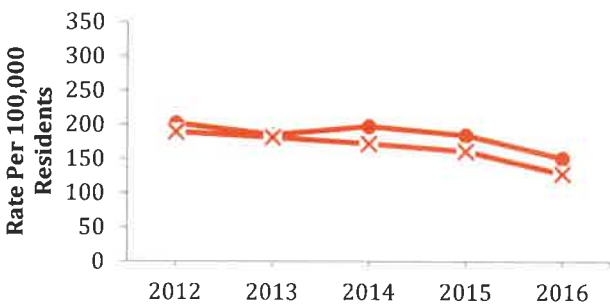
25-34 Years



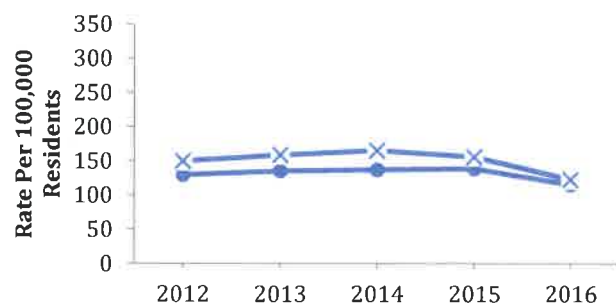
35-44 Years



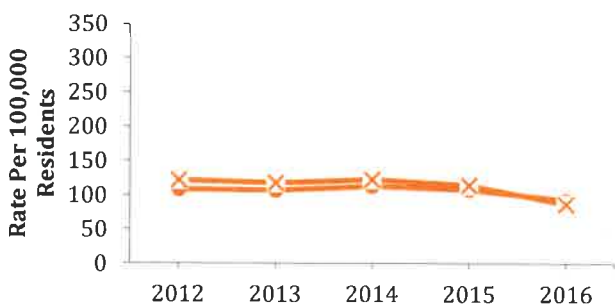
45-54 Years



55-64 Years



65+ Years

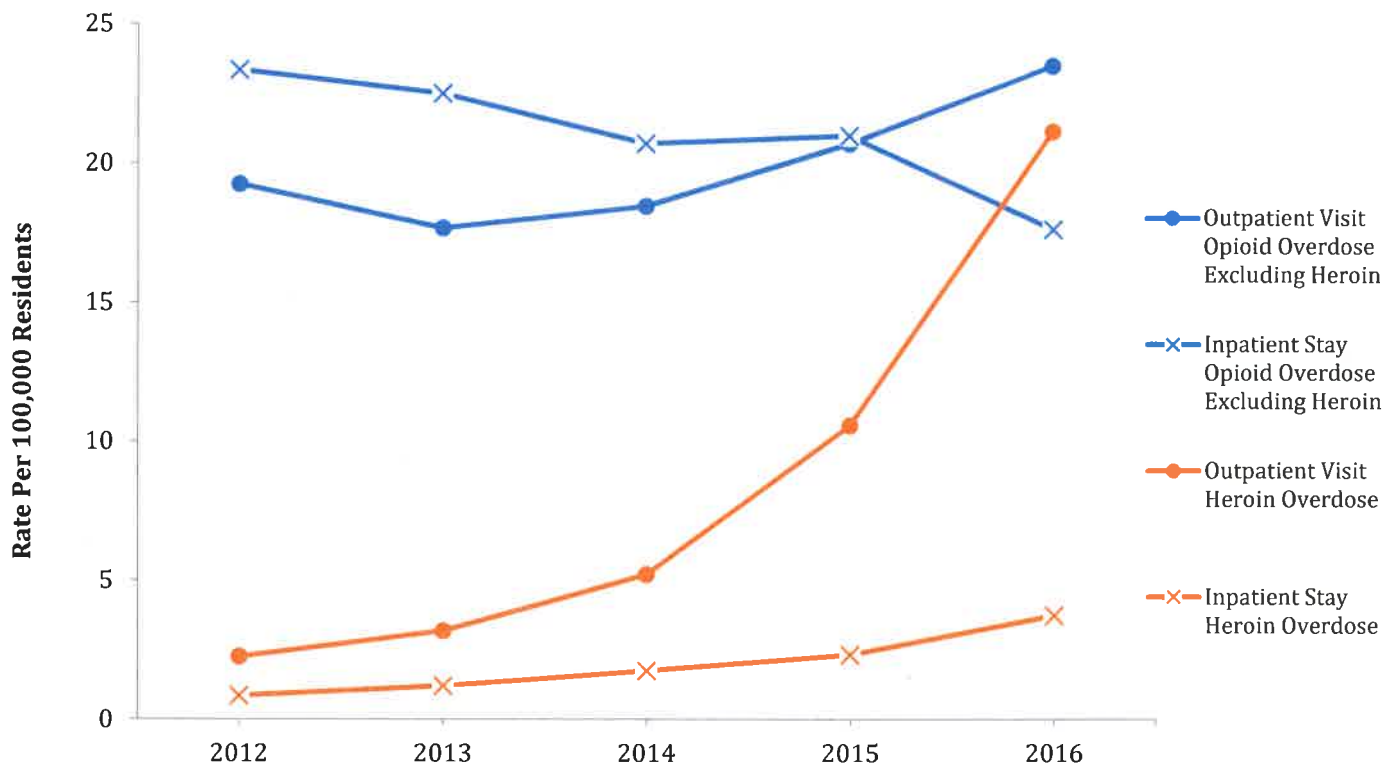


Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

2016 Drug Overdose Hospital Discharges in Tennessee

Opioid-Related Overdose Hospital Discharges

Age-Adjusted Rates for Outpatient Visits and Inpatient Stays for Opioid Overdoses in TN, 2012-2016



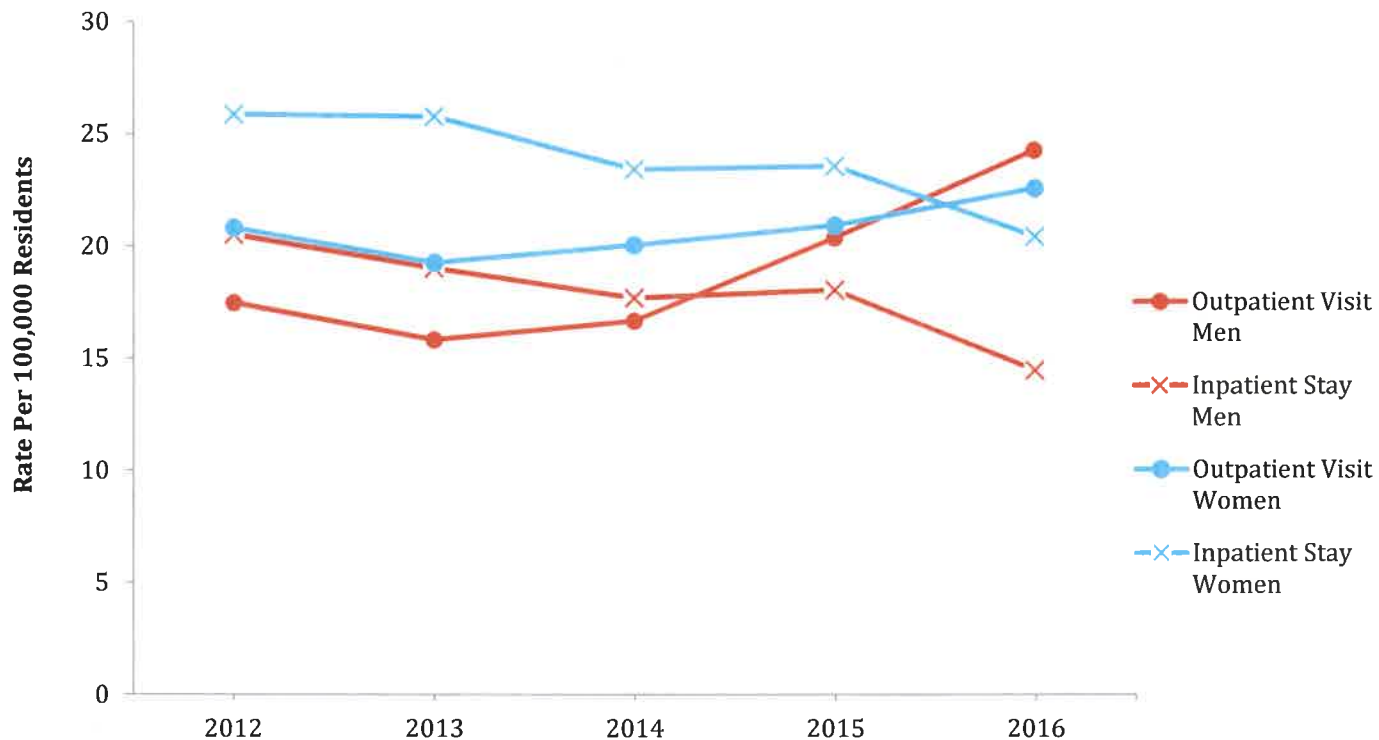
Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

In 2016, there were 2,884 hospital discharges for opioid overdose, excluding heroin. Of these opioid overdose discharges, 1,583 were outpatient visits and 1,301 were inpatient stay. Heroin overdose discharges reached a five year high, accounting for 1,564 of all overdoses, including 1,324 outpatient visits and 240 inpatient stays. Age-adjusted rates for outpatient visits and inpatient stays for both non-heroin opioid related overdoses⁸ and heroin overdoses⁹ from 2012 to 2016 are shown above. Outpatient visits for non-heroin opioid overdoses increased from 2014 to 2016, and surpassed inpatient stays for non-heroin opioid overdoses. Inpatient stays for heroin overdoses remained low, with a small increase observed from 2014 to 2016. In contrast, a large increase was observed for outpatient visits for heroin (2.3 per 100,000 in 2012 to 21.1 per 100,000 in 2016).

⁸ Opioid overdoses excluding heroin inpatient stays or outpatient visits caused by non-fatal acute poisonings due to the effects of all opioids drugs, excluding heroin, regardless of intent (e.g., suicide, unintentional, or undetermined). Identified using ICD-9-CM diagnosis codes through September 30th 2015 and thereafter using ICD-10-CM diagnosis codes (see Appendix C, Technical Notes for specific codes).

⁹ Heroin overdose inpatient stays or outpatient visits caused by non-fatal acute poisonings due to the effects of all opioids drugs, excluding heroin, regardless of intent (e.g., suicide, unintentional, or undetermined). Identified using ICD-9-CM diagnosis codes through September 30th 2015 and thereafter using ICD-10-CM diagnosis codes (see Appendix C, Technical Notes for specific codes).

Age-Adjusted Rates for Outpatient Visits and Inpatient Stays for Opioid Overdoses excluding Heroin by Sex in TN, 2012-2016

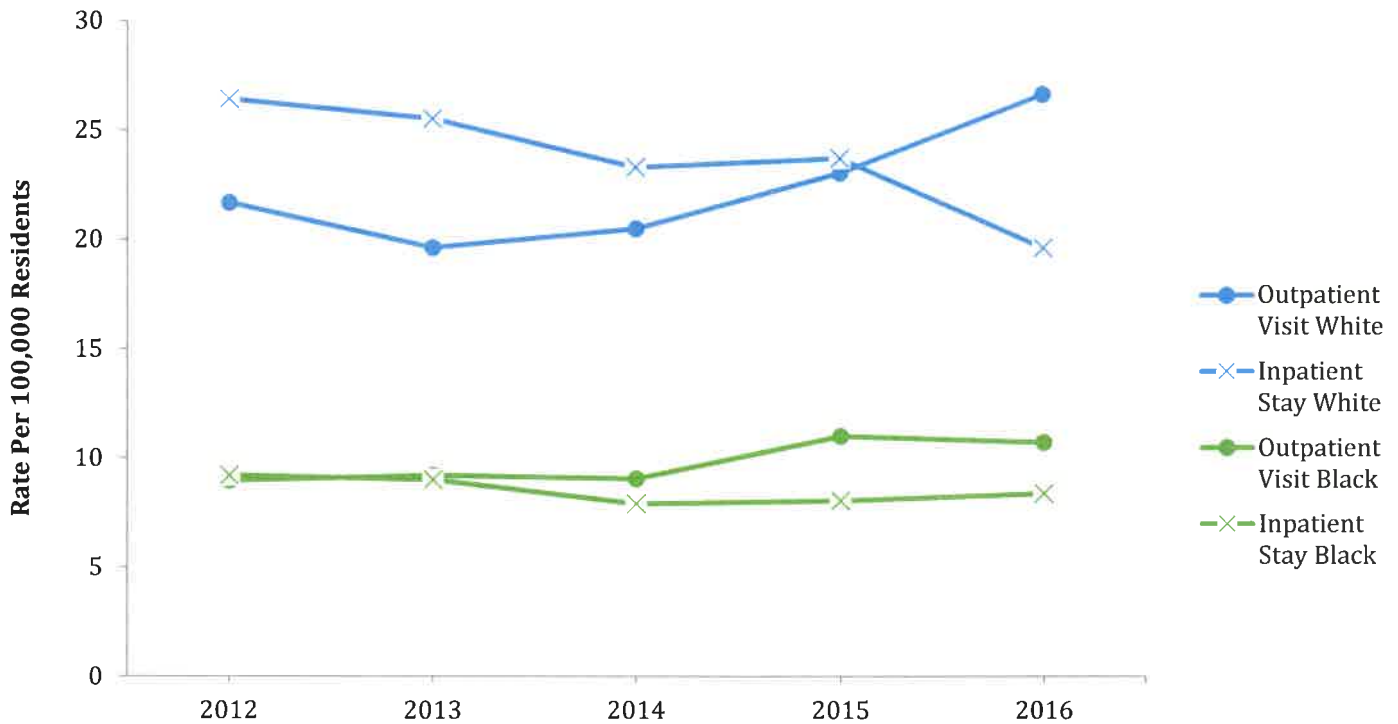


Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

In 2016, women accounted for 1,600 opioid overdose discharges (excluding heroin), roughly equally split between outpatient visits (799) and inpatient stays (801). Men accounted for 1,284 discharges (784 outpatient, 500 inpatient). The graph above shows trends in the age-adjusted rates for women and men from 2012 to 2016. Women had higher inpatient stays for non-heroin opioid overdoses than men and rates decreased for both men and women during 2012 to 2016. Rates for outpatient visits for non-heroin opioid overdoses were also higher for women through 2015, when rates for men surpassed rates for women, with high increases seen among men from 17.5 per 100,000 in 2012 to 24.3 per 100,000 in 2016.

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for Outpatient Visits and Inpatient Stays for Opioid Overdoses excluding Heroin by Race in TN, 2012-2016



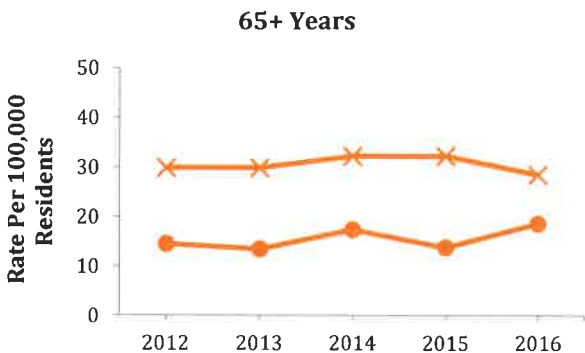
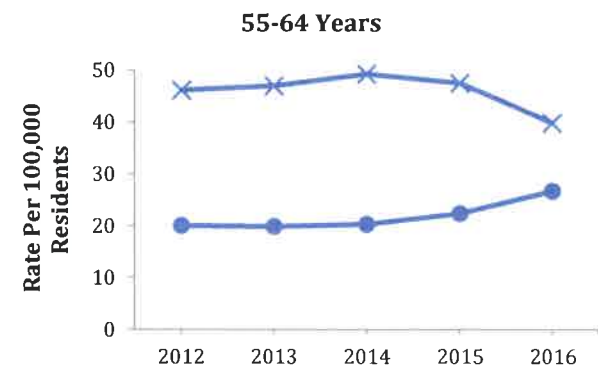
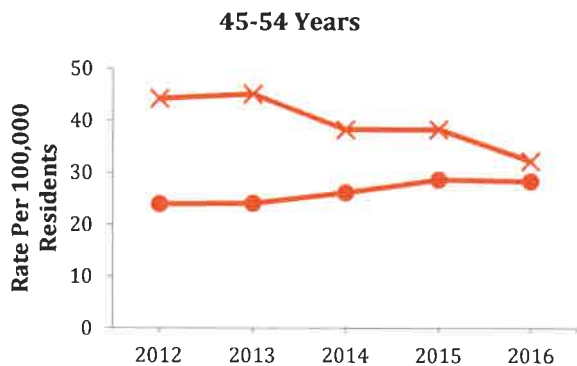
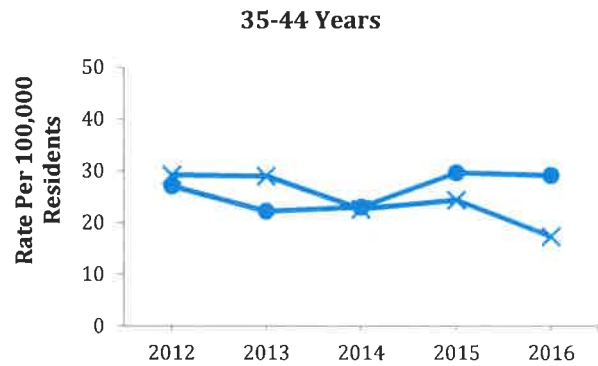
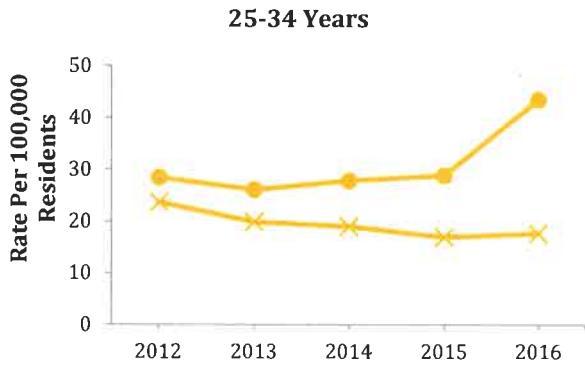
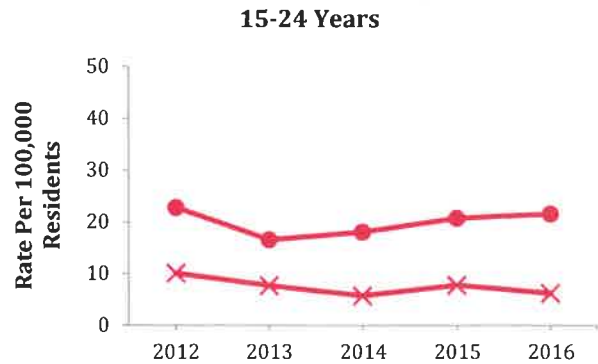
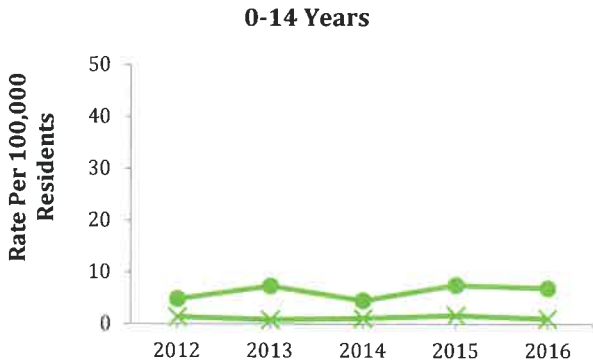
Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and d**

In 2016, Whites had the highest rate of outpatient visits and inpatient stays compared to Blacks. Whites accounted for 1,426 outpatient visits for opioid overdoses (excluding heroin) and 1,182 inpatient stays compared to 127 outpatient visits and 97 inpatient stays for Blacks. The graph above shows trends by race from 2012 to 2016. From 2012 to 2015, Whites had higher rates of inpatient stays than outpatient visits, but in 2016, outpatient visits became the most common type of hospital stay. Blacks, however, had relatively similar rates of outpatient visits and inpatient stays in 2012 and 2013 before outpatient visits became slightly more common in 2014.

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Specific Rates for Outpatient Visits and Inpatient Stays for Opioid Overdoses excluding Heroin by age in TN, 2012-2016

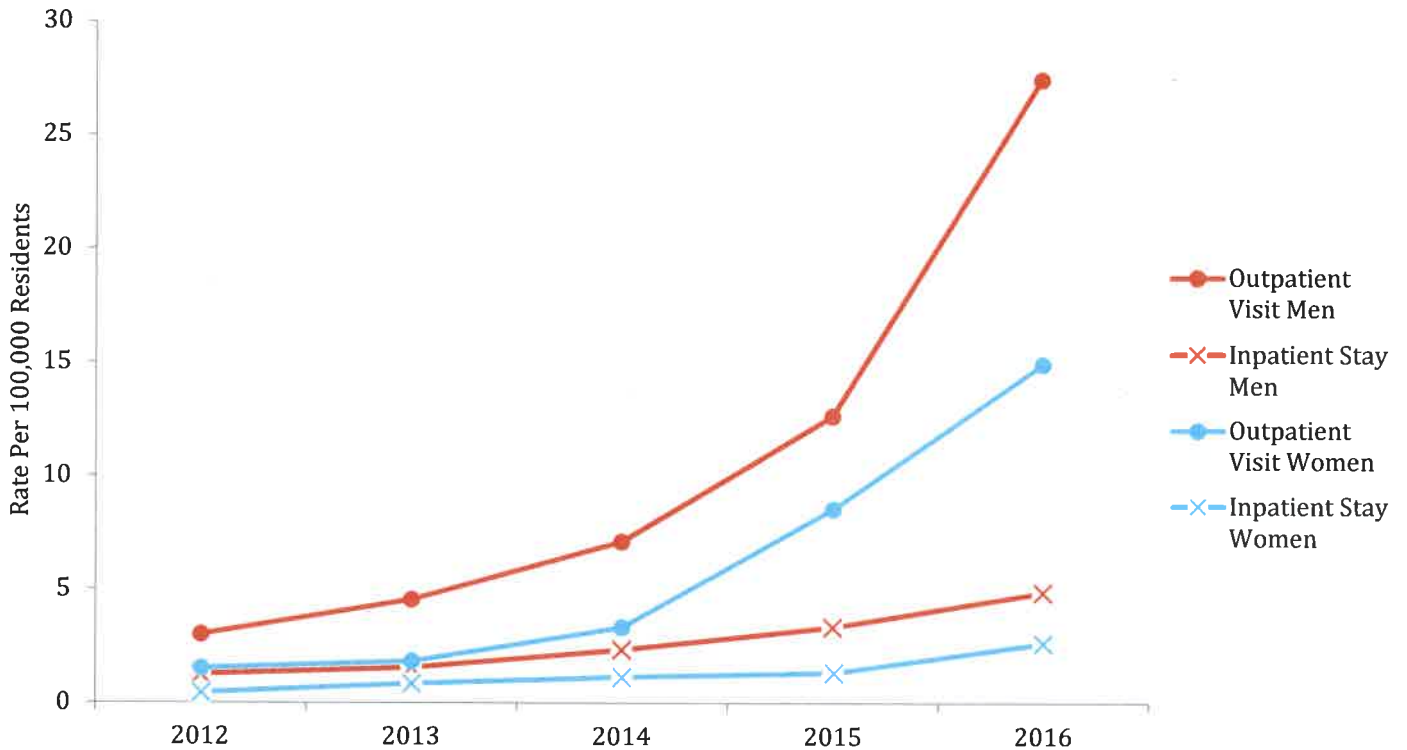
For all graphs, '•' refers to outpatient visits and 'x' refers to inpatient stays



Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for Outpatient Visits and Inpatient Stays for Heroin Overdoses by Sex in TN, 2012-2016

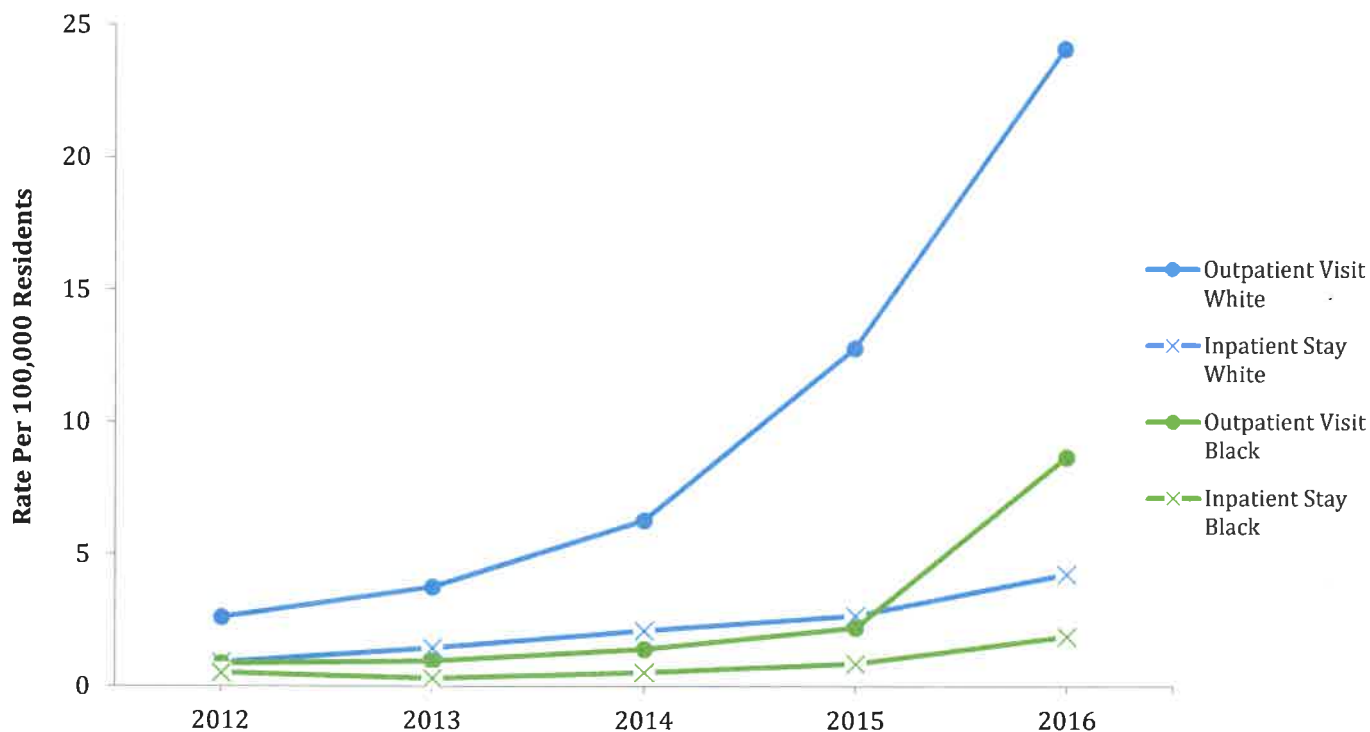


Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differen**

In 2016, heroin overdose discharges reached five year highs for men (1,009 total discharges) and women (555 total discharges). For both men and women, outpatient visits for heroin overdose (854 for men, 470 for women) were far more common than inpatient stays (155 for men, 85 for women). The graph above shows trends in hospital discharges for heroin overdoses among men and women from 2012 to 2016. Men and women have had similarly high increases over this five year period, particularly for outpatient visits which increased from 3.0 per 100,000 in 2012 to 27.5 per 100,000 in 2016 for men and from 1.5 per 100,000 in 2012 to 14.9 per 100,000 in 2016 for women. Men experienced a sharp 118% increase in their rate of outpatient stays between 2015 and 2016, alone.

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for Outpatient Visits and Inpatient Stays for Heroin Overdoses by Race in TN, 2012-2016



Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data Source: Hospital Discharge Data. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

Across race, heroin overdose discharges reached five year highs for both Whites (1,380 total discharges) and Blacks (129 total discharges) in 2016. Heroin discharges were primarily outpatient visits, accounting for 1,169 discharges among Whites and 105 discharges among Blacks. The graph above shows trends in the age-adjusted rates from 2012 to 2016 by race. The highest rates were for outpatient visits among Whites, with a substantial increase from 2.6 per 100,000 in 2012 to 24.1 per 100,000 in 2016. A sharp increase in rate for outpatient visits was observed among Blacks from 2015 (2.2 per 100,000) to 2016 (8.7 per 100,000).

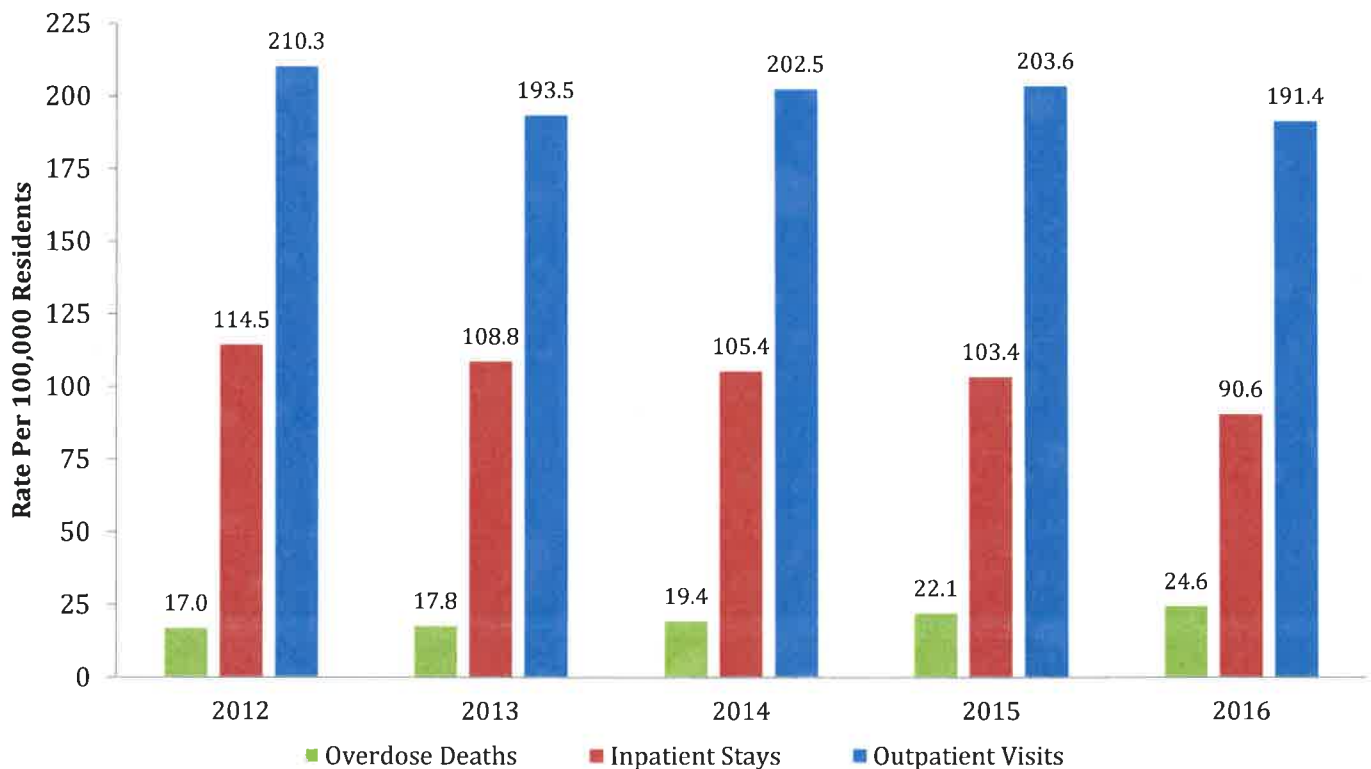
Age-specific rates for heroin overdose discharges are not shown due to low counts among several age groups. Following similar trends seen across sex and race, discharges were highest for most age groups in 2016 compared to earlier years. Increases are most striking among those aged 25-34 years who had an outpatient discharge rate of 70.0 per 100,000 in 2016. Outpatient discharge rates were also high among 15-24 year olds (33.0 per 100,000) and 35-44 year olds (31.3 per 100,000).

2016 Drug Overdose Hospital Discharges in Tennessee

Fatal and Non-Fatal Overdose Trends

The following graphs show non-fatal overdose hospital discharge rates alongside fatal overdose rates from 2012 to 2016. The death rates are derived from the TN Vital Statistics Death Statistical File, and include overdose deaths that occur both in and out of hospitals. **The vast majority of overdose deaths occur outside of hospitals.** In 2016, 143 TN residents died of a drug overdose while in a TN hospital (127 inpatient, 16 outpatient) out of 1,631 overdose deaths in total. Similar to the non-fatal hospital discharge rates presented above, the below rates exclude records with the discharge status of deceased.

Age-adjusted Rates for Hospital Discharges and Deaths due to All Drug Overdoses in TN, 2012-2016



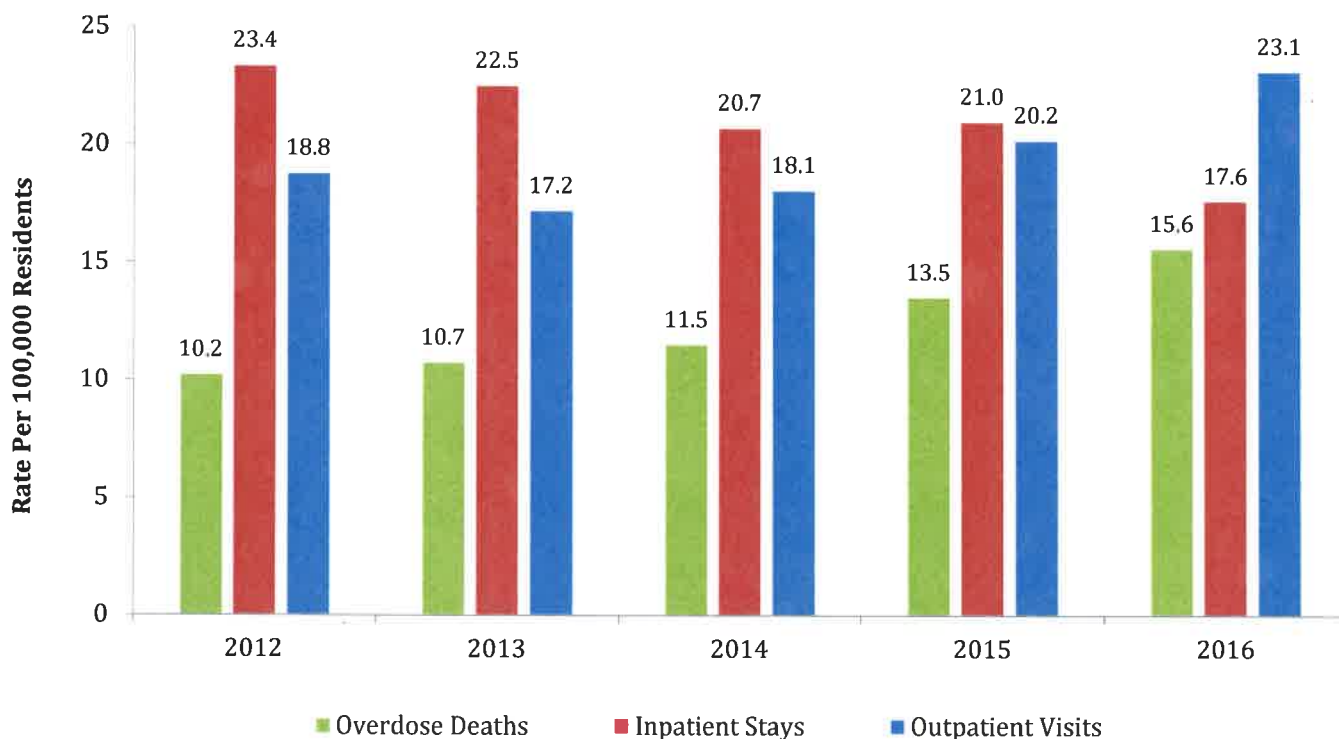
Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data source: Hospital Discharge Data. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, which should be considered in interpretation of trends.**

Rates of death from all drug overdoses increased steadily from 17.0 in 2012 to 24.6 in 2016 (a 45% increase in rate). Concurrently, rates for outpatient¹⁰ visits and inpatient stays have declined somewhat since 2012. In 2016, opioid overdose deaths accounted for 72% of all drug overdose deaths. The below graphs compare trends in fatal and non-fatal opioid (excluding heroin) and heroin overdoses.

¹⁰ Outpatient visits include primarily emergency department visits, but also include any observation 23 hours or less, ambulatory surgeries or certain diagnostic services (such as MRIs or CT scans).

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for Hospital Discharges and Deaths due to Opioid Overdoses excluding Heroin in TN, 2012-2016



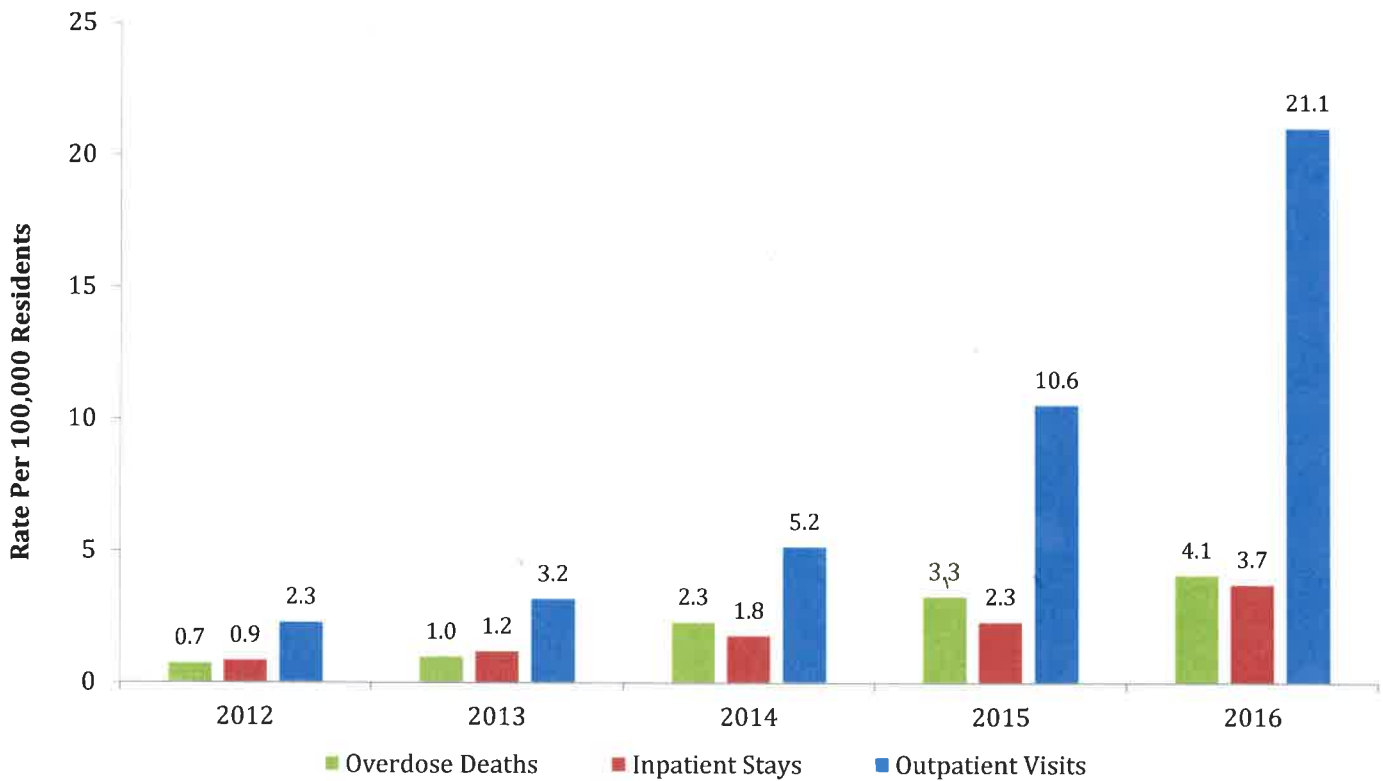
Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, which should be considered in interpretation of trends.**

In TN, from 2012 to 2016, the age-adjusted opioid (excluding heroin) overdose death rate increased more than 50% with a rate of 10.2 deaths per 100,000 residents in 2012 and a rate of 15.6 deaths per 100,000 residents in 2016. During that same time period in TN, for nonfatal opioid (excluding heroin) overdoses resulting in care and subsequent hospital discharge, the age-adjusted rate of inpatient stays decreased while outpatient visits¹¹ increased.

¹¹ Outpatient visits include primarily emergency department visits, but also include any observation 23 hours or less, ambulatory surgeries or certain diagnostic services (such as MRIs or CT scans).

2016 Drug Overdose Hospital Discharges in Tennessee

Age-Adjusted Rates for Hospital Discharges and Deaths due to Heroin Overdoses in TN, 2012-2016



Analysis by the Office of Informatics and Analytics, TDH (last updated February 23, 2018). Limited to TN residents. Data source: Hospital Discharge Data System. **On October, 1st 2015 there was a transition from ICD-9-CM to ICD-10-CM diagnosis coding, and differences after this change could be due to coding changes, which should be considered in interpretation of trends.**

In TN, the age-adjusted heroin overdose death rate in 2016 was over five times the rate in 2012, increasing from 0.7 deaths per 100,000 residents in 2012 to 4.1 deaths per 100,000 residents in 2016. From 2012 to 2016, the age-adjusted rate of non-fatal heroin overdose outpatient¹² visits resulting in care and subsequent hospital discharge increased over nine fold from 2.3 outpatient visits per 100,000 residents to 21.1 outpatient visits per 100,000 residents. During that same time period, the rate of nonfatal heroin overdose inpatient stays resulting in care and subsequent hospital discharge more than quadrupled with rates of 0.9 inpatient stays per 100,000 residents in 2012 and 3.7 inpatient stays per 100,000 residents in 2016.

¹²Outpatient visits include primarily emergency department visits, but also include any observation 23 hours or less, ambulatory surgeries or certain diagnostic services (such as MRIs or CT scans).

Technical Notes

Indicators	Drug Overdose Outpatient Visits and Inpatient Stays among Tennessee Residents
Measures	<ol style="list-style-type: none"> 1. Age-adjusted rates for all drug overdose outpatient visits and inpatient stays in TN, 2012-2016 2. Age-adjusted rates for all drug overdose outpatient visits and inpatient stays by sex in TN, 2012-2016 3. Age-adjusted rates for all drug overdose outpatient visits and inpatient stays by race in TN, 2012-2016 4. Age-specific rates for all drug overdose outpatient visits and inpatient stays by age in TN, 2012-2016 5. Age-adjusted rates for opioid overdose outpatient visits and inpatient stays in TN, 2012-2016 6. Age-adjusted rates for outpatient visits and inpatient stays for opioid overdoses excluding heroin by sex in TN, 2012-2016 7. Age-adjusted rates for outpatient visits and inpatient stays for opioid overdoses excluding heroin by race in TN, 2012-2016 8. Age-specific rates for outpatient visits and inpatient stays for opioid overdoses excluding heroin by age in TN, 2012-2016 9. Age-adjusted rates for outpatient visits and inpatient stays for heroin overdoses by sex in TN, 2012-2016 10. Age-adjusted rates for outpatient visits and inpatient stays for heroin overdoses by race in TN, 2012-2016 11. Age-adjusted rates for hospital discharges and deaths due to all drug overdoses in TN, 2012-2016 12. Age-adjusted rates for hospital discharges and deaths due to opioids excluding heroin in TN, 2012-2016 13. Age-adjusted rates for hospital discharges and deaths due to heroin in TN, 2012-2016
Definition of Measures	<p>Inpatient stays and outpatient visits determined by flag in Hospital Discharge Data System (HDDS). Generally, inpatient stays are hospitalizations lasting longer than 24 hours while outpatient visits are those less than 24 hours.</p> <p>Overdose is determined by International Classification of Disease (ICD), Clinical Modification, 9th or 10th revision codes available in the HDDS discharge records. Prior to October 1, 2015, hospitals reported 9th revision codes (ICD-9-CM) and afterward reported 10th revision codes (ICD-10-CM). Relevant codes for each revision are listed for each rate definition below. Outpatient and inpatient overdose counts presented in this report correspond to the numerators listed below.</p>

2016 Drug Overdose Hospital Discharges in Tennessee

Definition of Measures (continued)

Age-adjusted rates for all drug overdose outpatient visits and inpatient stays

- **Numerator** – count of outpatient visits or inpatient stays caused by acute poisonings due to the effects of drugs, regardless of intent
 - ICD-9-CM principal diagnosis codes:
960-979 (poisoning by drugs, medicinal, and biological substances)
OR first-listed external cause of injury codes:
E850-E858 (accidental poisoning by drugs, medicinal, and biological substances),
E950.0-E950.5 (self-inflicted poisoning by solid or liquid substances), E962.0 (assault by drugs and medicinal substances),
or E980.0-E980.5 (poisoning by solid or liquid substances of undetermined intent)
 - ICD-10-CM principal diagnosis codes:
T36-50 (poisoning by drugs, medicaments, and biological substances) with intent codes 1-4 (accidental, intentional, assault, or undetermined) and encounter code A, D, or missing (initial or subsequent encounter but not a sequela)
- **Denominator** – Yearly state population in 100,000s

Age-adjusted rates for opioid overdose excluding heroin outpatient visits and inpatient stays

- **Numerator** - count of outpatient visits or inpatient stays caused by acute poisonings due to the effects of all opioids excluding heroin, regardless of intent
 - ICD-9-CM principal diagnosis codes:
965.00 (poisoning by opium),
965.02 (poisoning by methadone),
or 965.09 (poisoning by other opiates and related narcotics)
OR first-listed external cause of injury codes:
E850.1 (accidental poisoning by methadone)
or E850.2 (accidental poisoning by other opiates and related narcotics)
 - ICD-10-CM principal diagnosis codes:
T40.0X (poisoning by opium),
T40.2X (poisoning by other opioids),
T40.3X (poisoning by methadone),
T40.4X (poisoning by synthetic narcotics),
T40.60 (poisoning by unspecified narcotics),
or T40.69 (poisoning by other narcotics)
with intent codes 1-4 (accidental, intentional, assault, or undetermined) and encounter code A, D, or missing (initial or subsequent encounter but not a sequela)
- **Denominator** – Yearly state population in 100,000s

Age-adjusted rates for heroin overdose outpatient visits and inpatient stays

- **Numerator** - count of outpatient visits or inpatient stays caused by acute poisonings due to the effects of heroin, regardless of intent
 - ICD-9-CM principal diagnosis code:
965.01 (poisoning by heroin)
OR first-listed external cause of injury code:
E850.0 (accidental poisoning by heroin)
 - ICD-10-CM principal diagnosis codes:
T40.1X (poisoning by heroin)
with intent codes 1-4 (accidental, intentional, assault, or undetermined) and encounter code A, D, or missing (initial or subsequent encounter but not a sequela)
- **Denominator** – Yearly state population in 100,000s

2016 Drug Overdose Hospital Discharges in Tennessee

Age/Race/Sex stratification

- Age is determined according to date of birth and at date of admission to hospital.
- Race and sex are reported by the hospital to the hospital discharge data system.
- Due to low numbers, patients of unknown race, Native American, Alaskan Native, Asian or Pacific Islander or listed as unknown are not included in figures

Age-adjustment is used for all non-fatal overdose rates except for those stratified by age. Age-adjusted rates were calculated using 2000 US standard population for age-adjustment. The rate for a specific age group in a given population was multiplied by the proportion of people in the same age group in the 2000 U.S. standard population; adding across age groups yields the final age-adjusted rate.

Time Period 2012 – 2016

Inclusion/ Exclusion Criteria

- Only Tennessee residents were considered
- Only discharges from non-federal, acute care hospitals were included
- Excludes patients discharged as dead/deceased
- Late effects, adverse effects, and chronic poisonings due to the effects of drugs were excluded

Data Sources

- Tennessee Hospital Discharge Data System (HDDS) 2012-2016
- Population data for 2013-2016 was obtained from CDC Wonder bridged race populations estimates. The vintage year of the populations corresponds to the year of the indicator. (See <http://wonder.cdc.gov/bridged-race-population.html> for more details).

General Limitations of the Measures

- Non-fatal overdoses are only captured as hospital discharges and do not include those non-fatal overdoses that do not end up at an acute-care facility.
- Cases are selected primarily on the basis of principal diagnosis codes, so some overdoses may not be captured if they were coded as a secondary diagnosis.
- Limited to non-federal acute care-affiliated facilities. Excludes VA and other federal hospitals, rehabilitation centers, and psychiatric hospitals

For additional information about Prescription Drug Overdose Program and team members:

Visit our web page at: <https://www.tn.gov/health/health-program-areas/pdo/pdo/who-we-are.html>

For county-level data, visit the TN Drug Overdose Data Dashboard: <https://www.tn.gov/health/health-program-areas/pdo/pdo/data-dashboard.html>

Contact us by email: Prescription.Drugs@tn.gov