Hepatitis C – TB

Is there an association?

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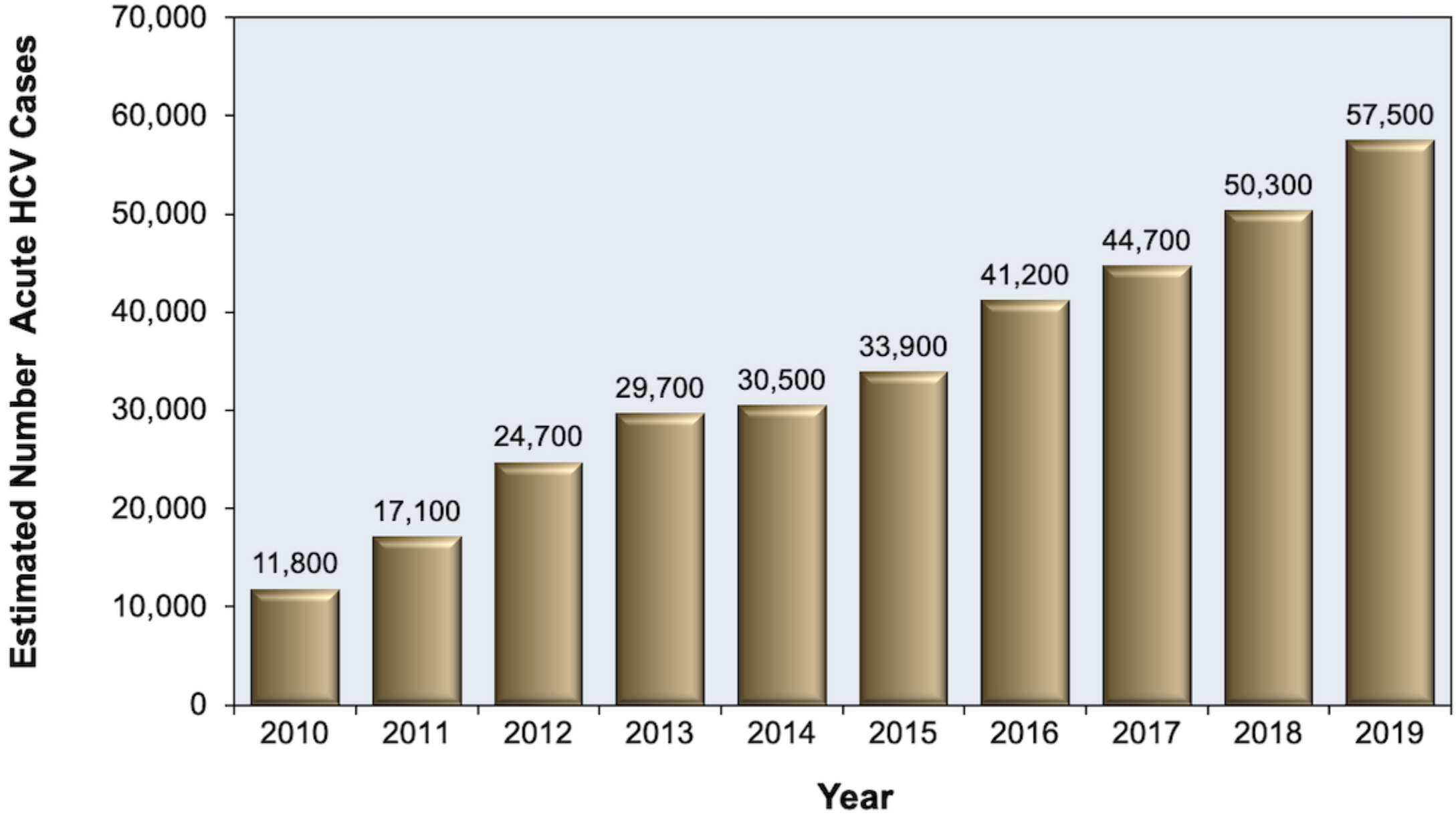
TB - HCV

MTB

- Globally 1.7 "**billion**" infected with MTB
  - Highest prevalence Africa and Asia
- Likely over 1000 cases in Texas for 2022

HCV

- Globally - 58 **million** with chronic HCV
  - 1.5 million new cases/year
    - Highest prevalence in WHO's eastern Mediterranean and European regions
- U.S. 2019 – 123,312 newly reported chronic cases


Estimated Number Acute HCV Cases
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
11,800
17,100
24,700
29,700
30,500
33,900
41,200
44,700
50,300
57,500
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Year

Who is at risk and should be tested ?

Contacts of someone with TB

People who have lived in areas of world where TB is common

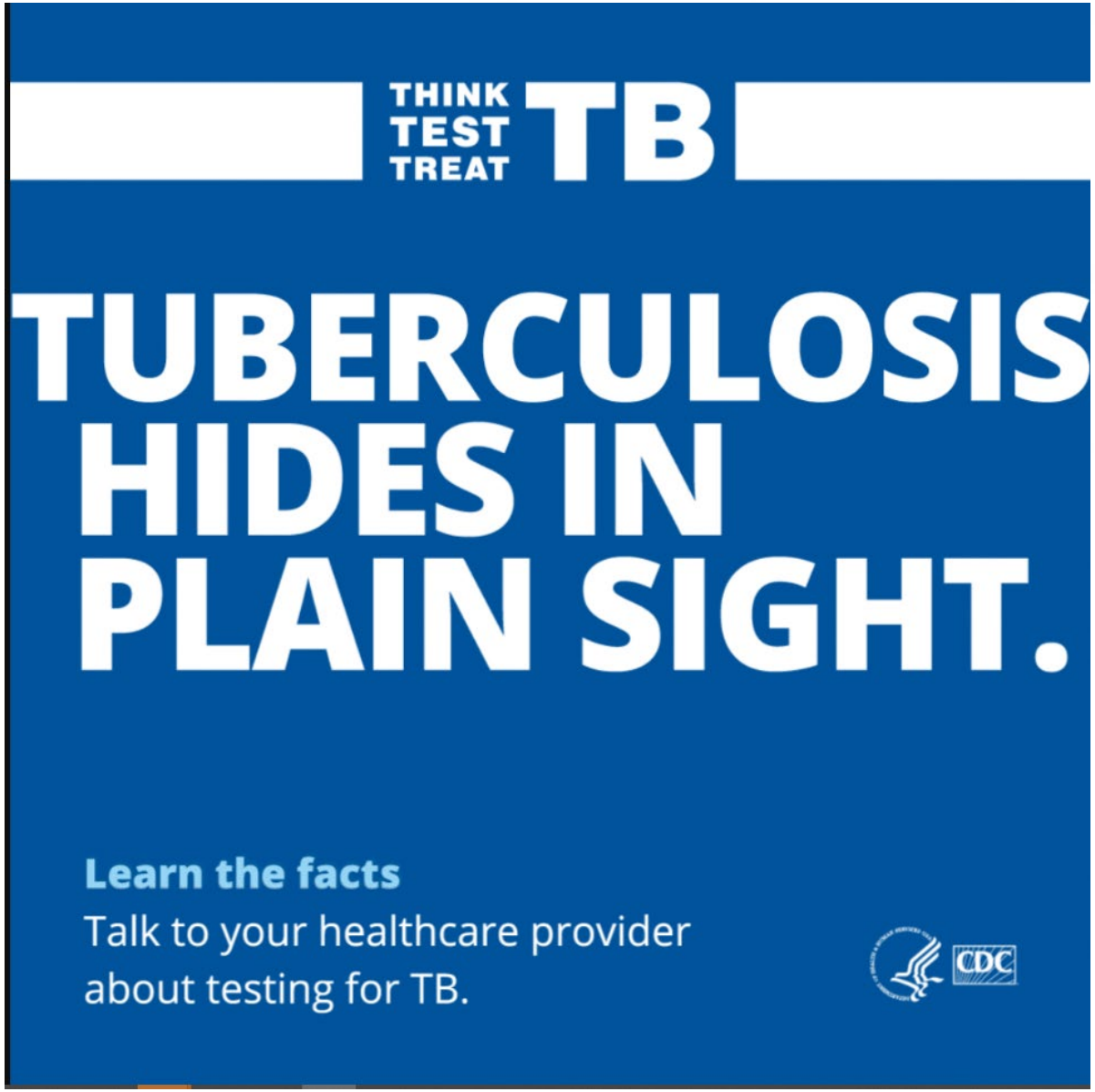
People who like or work in high-risk settings

- correctional settings
- long term care facilities
- nursing homes
- homeless shelters

Health-care workers who care for patients at increased risk of TB disease

Infants, children and adolescents exposed to adults who are at increased risk for LTBI or TB disease

Those with HCV infection????



Who is at Increased Risk of Progression to TB Disease and Should be Treated ?

Those with recent TB infection (last 2 years)

Babies and young children

People who inject drugs

People not treated correctly for TB in past

People sick with other diseases that weaken immune system

Risk Factors for Progression from LTBI to Active TB Disease

- Immune compromising conditions
  - HIV
  - Diabetes
  - Organ Transplantation
  - Smoking
  - Malignancy
  - Immune suppressing medications
  - Elderly
  - **Hepatitis C????**

Table 3.3. Reported risk behaviors or exposures*† among reported cases of acute hepatitis C virus infection — United States, 2019

Print

◀ Table 3.2

Table 3.4 ▶

Risk behaviors/exposures	Risk identified*	No risk identified	Risk data missing
Injection drug use	1,302	650	2,184
Multiple sexual partners	223	594	3,319
Surgery	179	888	3,069
Sexual contact §	142	334	3,660
Needlestick	91	886	3,159
Men who have sex with men ¶	42	315	2,114
Household contact (non-sexual) §	36	440	3,660
Dialysis patient	61	1,249	2,826
Occupational	7	1,278	2,851
Transfusion	3	1,105	3,028

Source: CDC, Nationally Notifiable Diseases Surveillance System.

Clinical Infectious Diseases

MAJOR ARTICLE

Association of Treated and Untreated Chronic Hepatitis C With the Incidence of Active Tuberculosis Disease: A Population-Based Cohort Study

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January 2023

- **Study aim:** Assess how untreated and treated chronic HCV infection status impacts the incidence of active TB disease.
- **Hypothesis:** Incidence of active TB is highest among those with untreated chronic HCV infection followed by those who were treated and lowest among those never infected with HCV
- Conducted cohort study among adults in Georgia tested for HCV from 1/1/2015 – 9/30/2020
  - Excluded those with known diagnosis of active TB disease before or at time of first HCV test.

Methods and Setting:

Eastern European country of Georgia

TB 70 cases/100,000 in 2020

All TB diagnostic and treatment services free

During study period only children < 5 and high-risk groups such as HIV + were offered LTBI testing and screening.

Chronic HCV infection highly prevalent in Georgia

Affects 5.4% of general adult population

First country to implement nationwide program to eliminate HC

Screening in multiple setting and free treatment

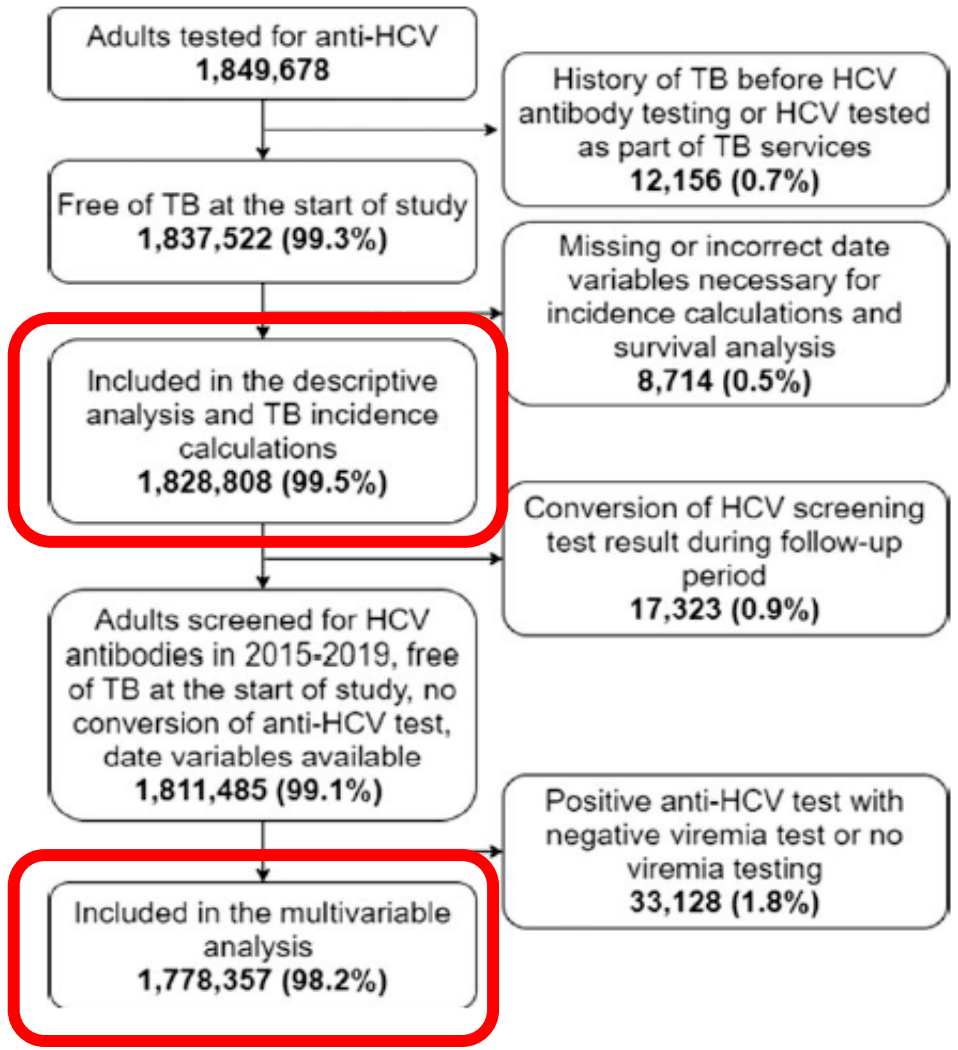

Figure 1. Flow chart of study population: persons tested for HCV antibodies, 1

Followed for median time 26 months for TB disease after screen

Results

- Active TB diagnosed in 3136 persons during follow up

- Incidence rate/1000,000 person-years:
  - Untreated HCV – 296 **> 4 times higher than never infected**
  - Treated HCV - 109 1.7 times higher than never infected
  - HCV negative - 65

- Those treated who had sustained virologic suppression had lower rates of TB (1.5 times greater than never infected).

Conclusions

- Adults with HCV infection, particularly untreated individuals were at high risk of developing active TB disease
- Persons with HCV infection should be screened for LTBI TB infection and active TB disease
- Suggests those who are positive be treated for LTBI
  - Safety of LTBI therapy unclear in chronic HCV

HCV and the Immune Response

- HCV infection associated with impaired macrophage activation and T-cell responses
  - Reduces production and concentration of INF-gamma and TNF alpha
    - These are involved with activation of macrophages; essential for control of MTB
  - Increases level of inhibitory cytokines such as interleukin-10
    - These cytokines inhibit those cytokines needed for effective response against MTB
  - Affects natural killer cells
    - Reduces their capability to produce cytokines involved in immune response pathways against MTB
  - Viral persistence in chronic HCV can lead to functionally inferior T cells – T cell exhaustion
    - which leads to decreased release of inflammatory mediators including IFN gamma

Table 3.7. Number and rates* of deaths with hepatitis C listed as a cause of death† among residents, by state or jurisdiction — United States, 2015–2019

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◀ Table 3.6

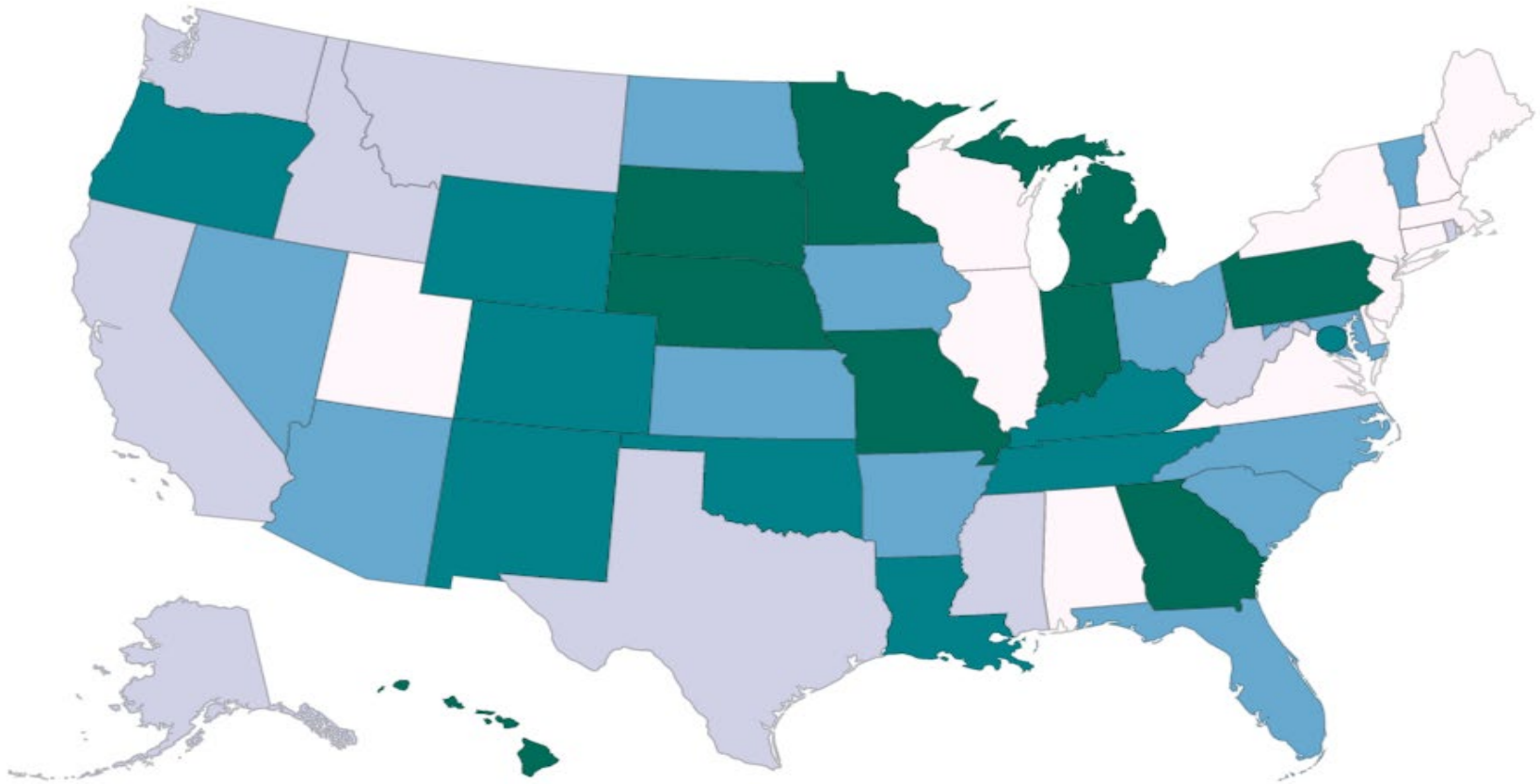
Texas in top three by number of deaths but not rate

Table 3.8 ▶

State or Jurisdiction	2015 No.	2015 Rate*	2016 No.	2016 Rate*	2017 No.	2017 Rate*	2018 No.	2018 Rate*	2019 No.	2019 Rate*
Pennsylvania	726	4.18	564	3.28	563	3.15	417	2.37	445	2.48
Rhode Island	97	7.26	89	6.57	76	5.15	91	6.37	57	3.79
South Carolina	294	4.67	299	4.51	302	4.51	259	3.7	220	3.09
South Dakota	35	3.33	37	3.46	29	2.56	30	2.8	29	2.61
Tennessee	592	7.27	482	5.89	469	5.57	517	6.01	491	5.77
Texas	1,996	6.72	1,886	6.12	1,888	6.03	1,708	5.3	1,383	4.2

CDC National Center for Health Statistics; http://wonder.cdc.gov/mcd-icd10.html

Rates of death with HCV infection listed as a cause of death – U. S., 2019



Thank You!

Hepatitis C in Texas

If you are at risk, get tested!

What is hepatitis C?

Hepatitis C is a blood-borne virus that predominantly infects the cells of the liver.

Up to 85% of all hepatitis C virus infections become chronic, meaning the virus is in the body for more than six months.

Chronic hepatitis C can cause:

- Cirrhosis of the liver
- Liver failure
- Liver cancer

People at highest risk of developing hepatitis C:

Adults born during 1945-1965 (baby boomers) account for 73% of all hepatitis C associated mortality. **3 out of 25 people** in Texas identify as baby boomers.

1 in 4 people living with HIV are infected with hepatitis C. An estimated **21,667** are coinfected with HIV and hepatitis C in Texas.

People who inject and share drugs or other materials are more likely to have hepatitis C. Injection drug use is the source of infection for 60% of persons with hepatitis C.

Hepatitis C in Texas

More than **25%** of Texans are at risk

Over **584,196** people in Texas may have chronic hepatitis C

Mortality increased in Texas by 71% in men and 29% in women since 1990

New medications can cure hepatitis C in 2-3 months with few side effects.

The cure rate is 95%.