

Hepatitis C Basics

Takako Schaninger, MD

University of Kentucky

Veterans Affairs Medical Center, Lexington, KY

Faculty Disclosure

- I have nothing to disclose

Need/Practice Gap & Supporting Resources

- A substantial number of people with chronic hepatitis C are undiagnosed
- Hepatitis C treatment for PWID (people who inject drugs) has shown good outcomes, however, treatment uptake has remained low

Objectives

- Learn the epidemiology of hepatitis C infection, natural history, diagnosis, and management

Expected Outcomes

Upon completion of this activity, participants will be able to

- Discuss the prevalence of hepatitis C in the US general population and PWID
- Review the natural history and pathophysiology of hepatitis C
- Describe how to formulate and implement strategies for preventing, diagnosing, and treating hepatitis C

Which Country Do You Think Has The Highest Prevalence of HCV?

- A. United States
- B. Brazil
- C. Egypt
- D. Russia
- E. Italy



Hepatitis C Sweeps Through Egypt



>40% Prevalence in 1996 in Egypt

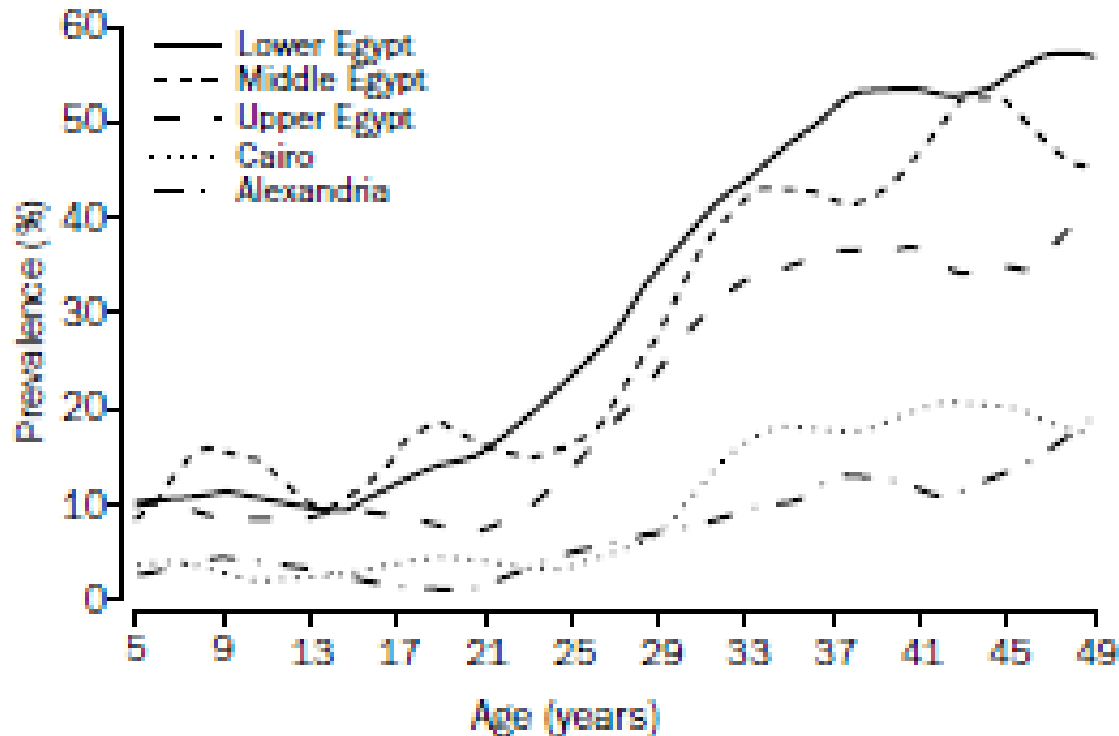


Figure 4: Prevalence of antibodies to HCV by age and region

Chronic Schistosomiasis Causes Portal Hypertension, Bladder Cancer, and More

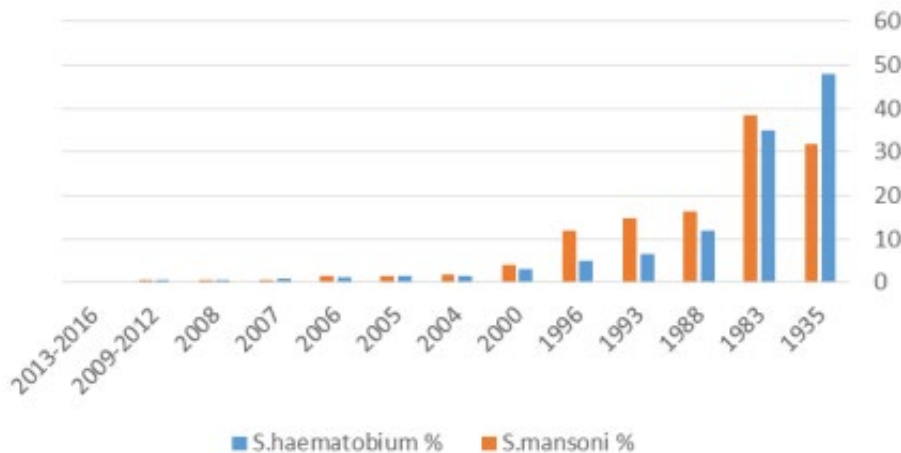


Mass Elimination Campaigns Resulted in Iatrogenic HCV Transmission

Mass Elimination Campaigns Started in 50's

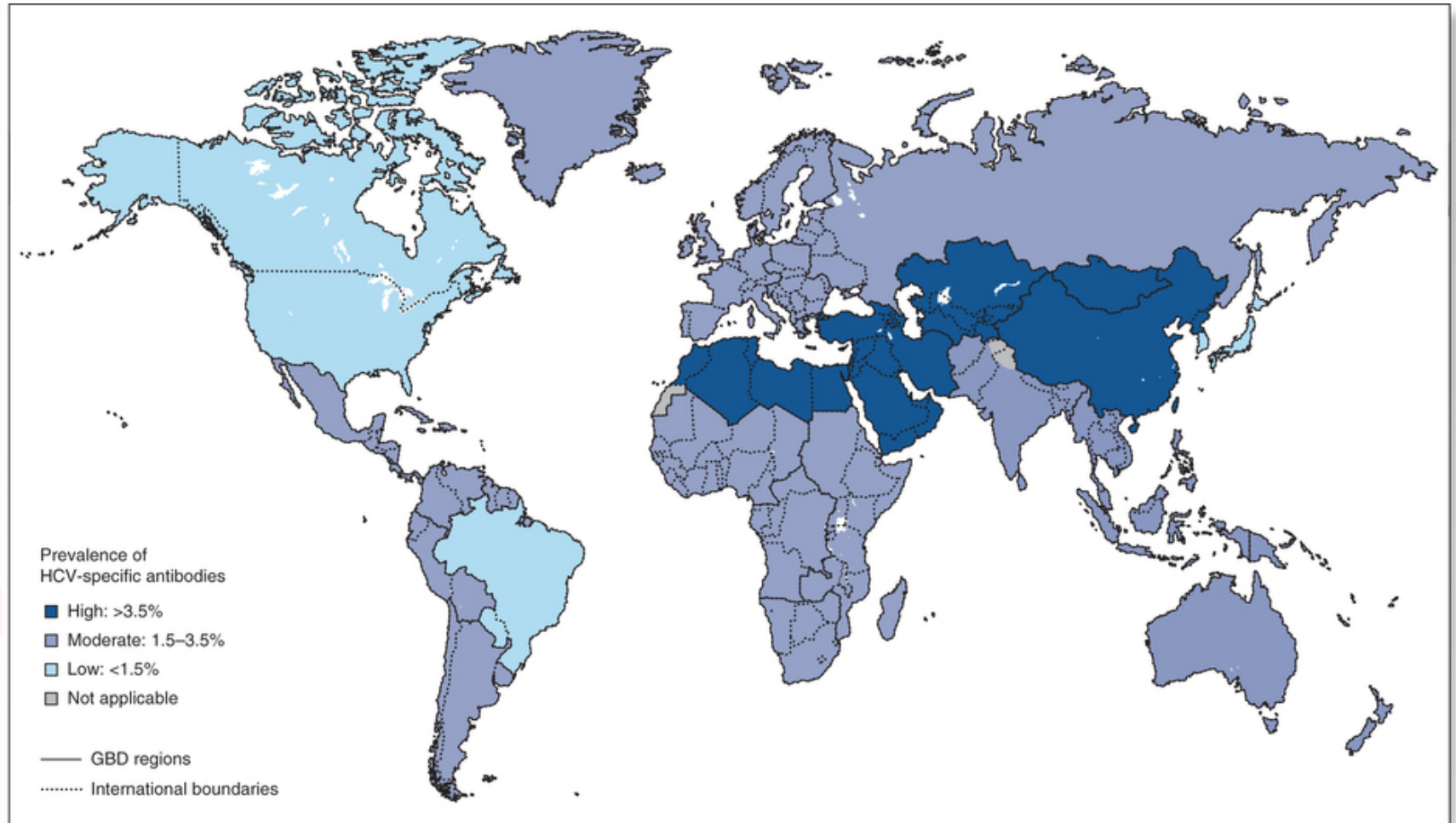


Prevalence of schistosomiasis in Egypt
1935:2016



HCV Antibody
Egypt 14.8%
USA 1.7%

HCV Has Broad Global Prevalence





How Many People Are Estimated to Have Chronic HCV in US?

- A. 600,000
- B. 1,200,000
- C. 2,400,000
- D. 3,600,000

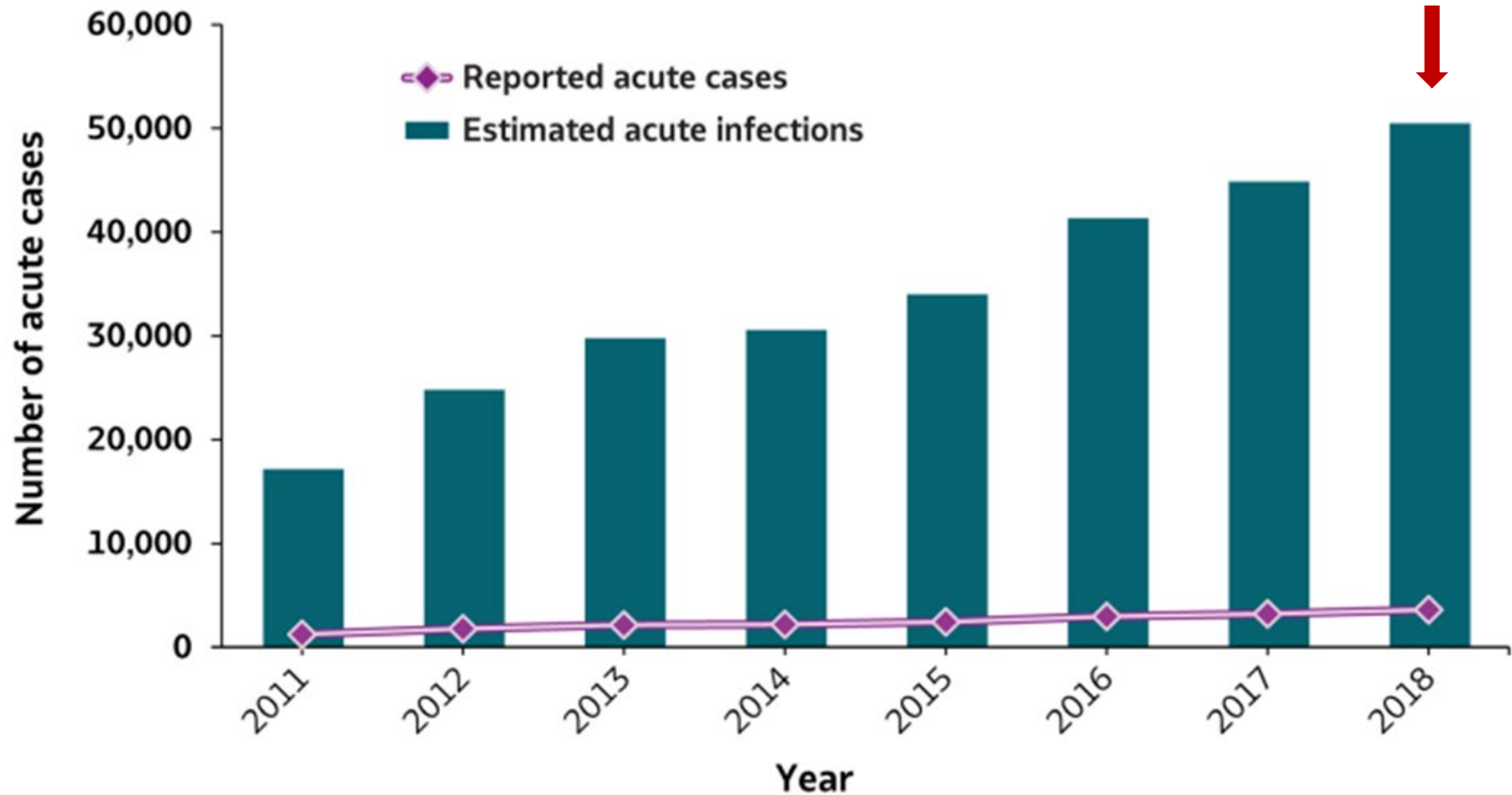
2.4 Million Americans Are Living with HCV



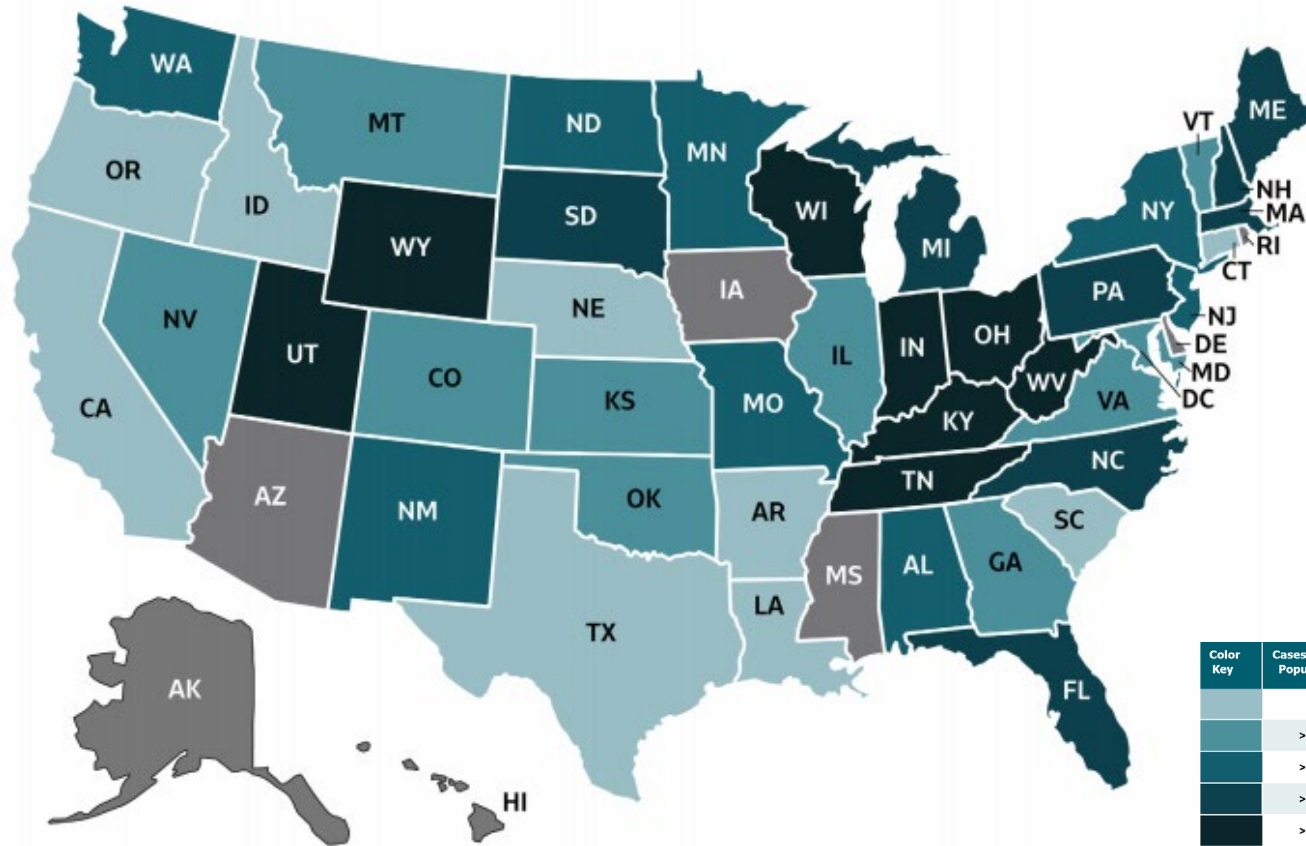
HCV Cases Are Increasing

50,300

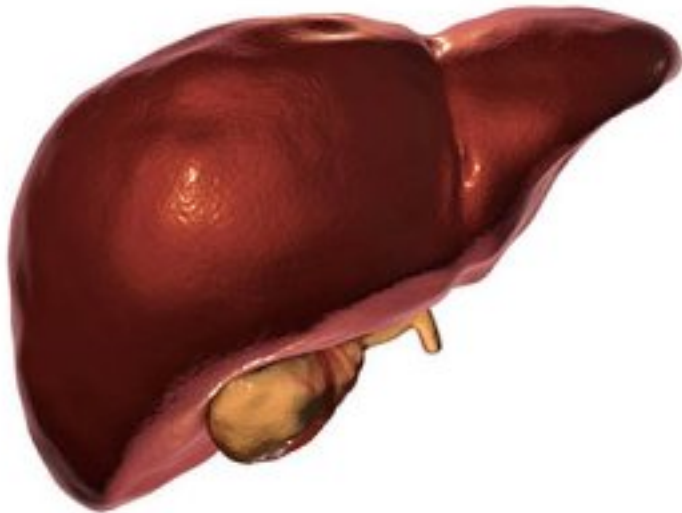
New Cases in 2018



New HCV Cases in the US, 2018



Hepatitis C Is Deadly



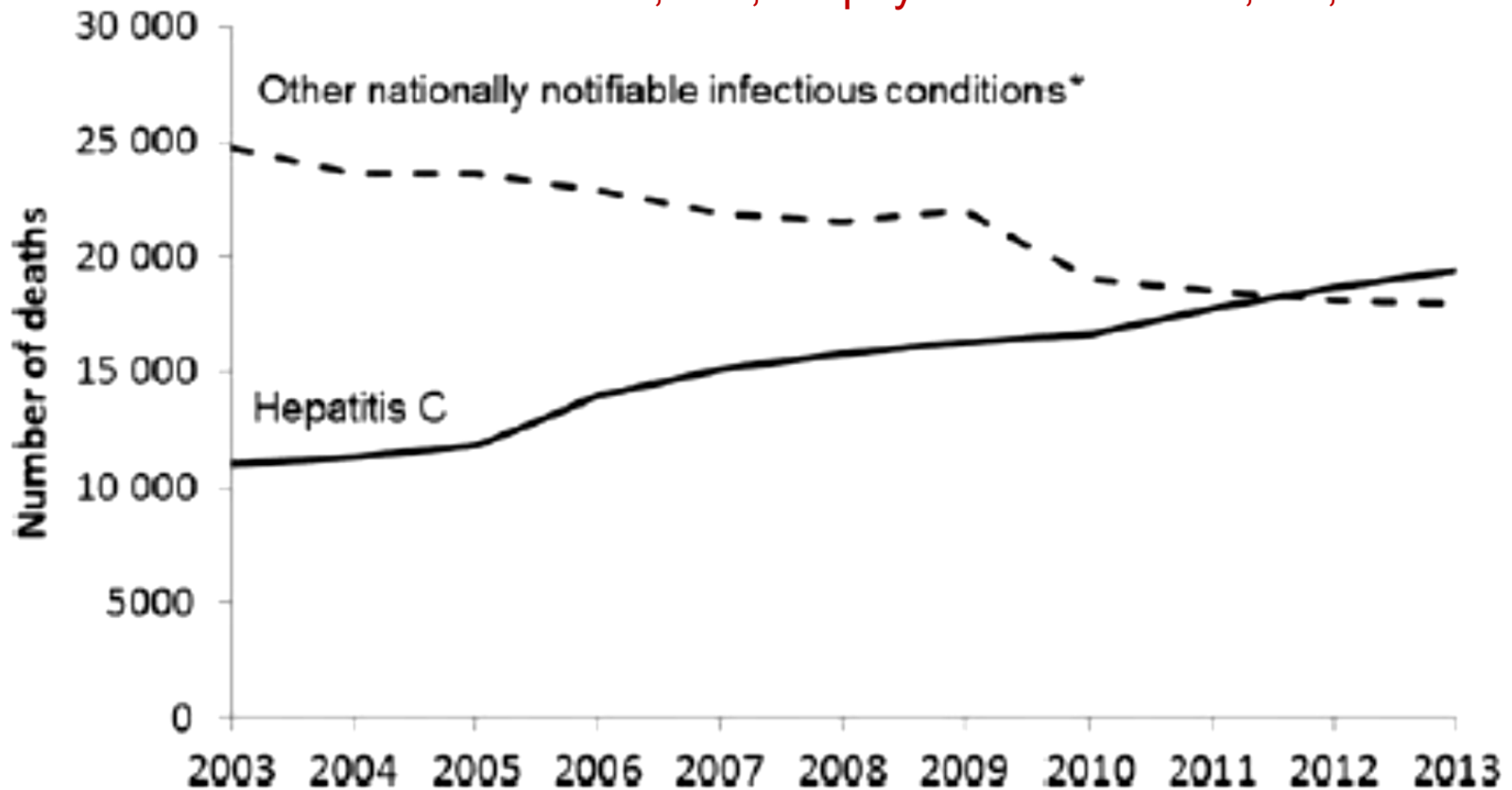
Healthy liver



Cirrhotic liver

HCV Killed 20,000 Americans in 2013

60 other nationally notifiable infectious conditions all combined:
Pneumococcal, HIV, Staphylococcus aureus, TB, influenza, etc.



Among Persons Living with HCV in US, What Percentages Were Born Between 1945 and 1965?

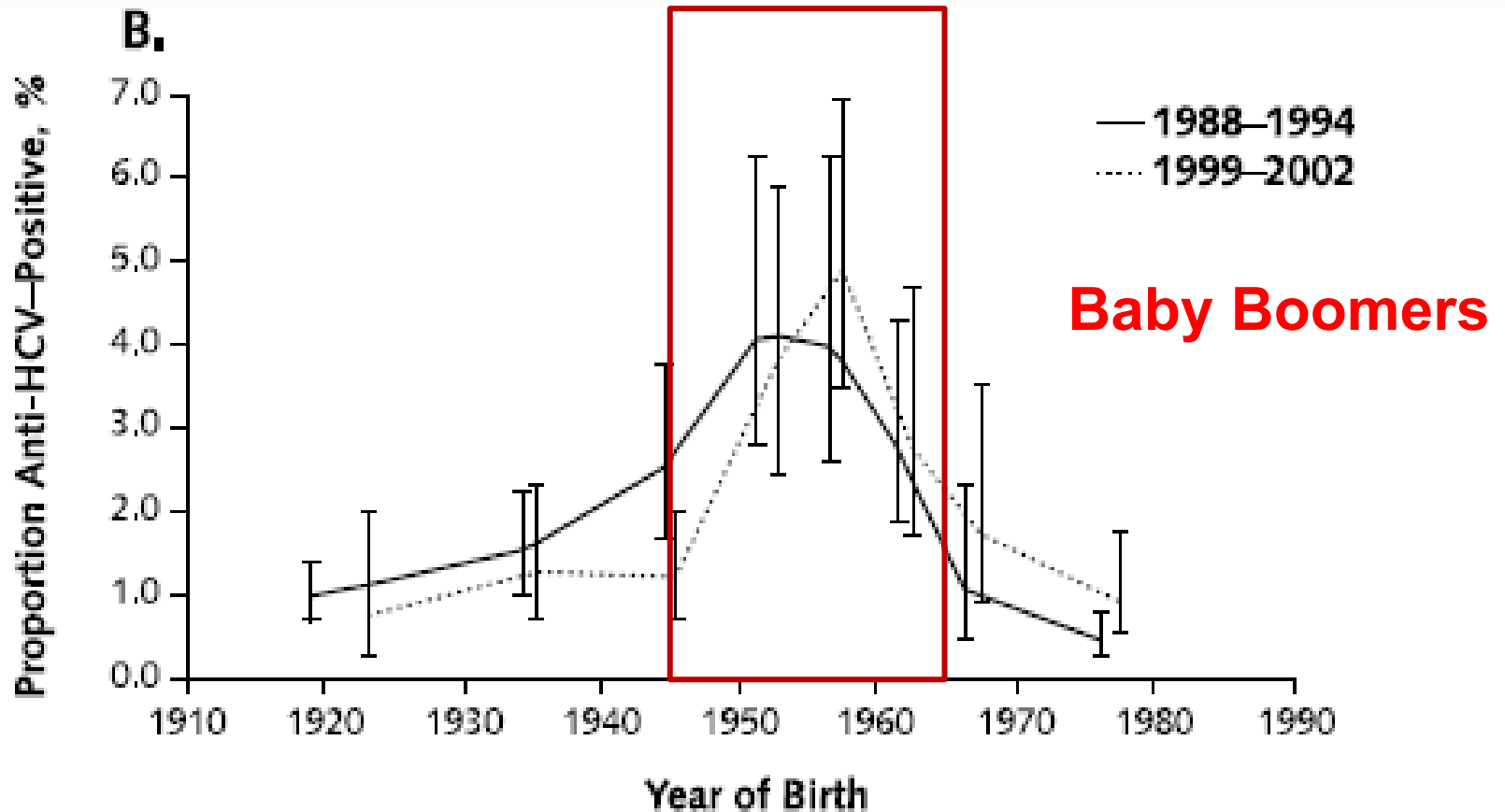
A. 30%

B. 45%

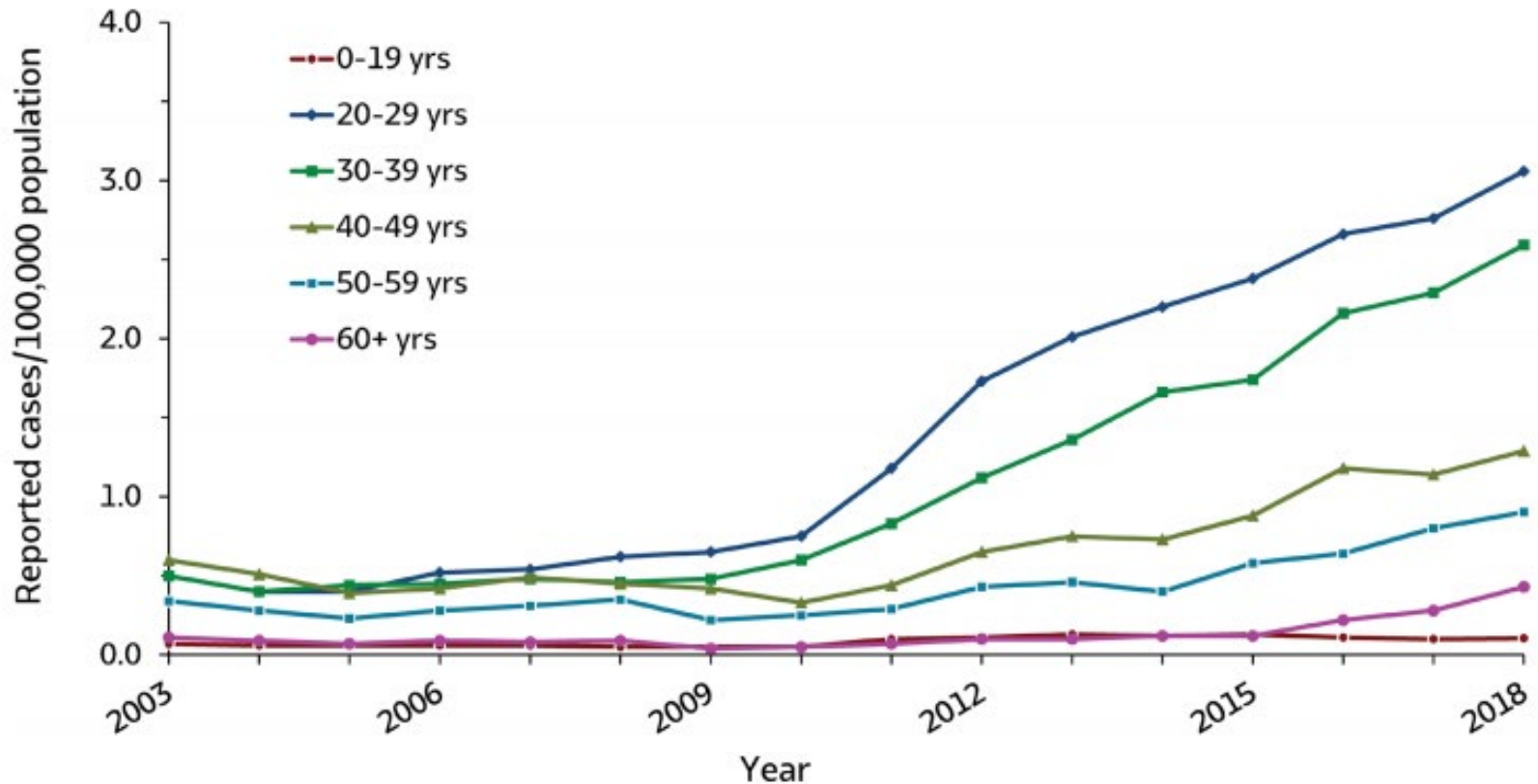
C. 60%

D. 75%

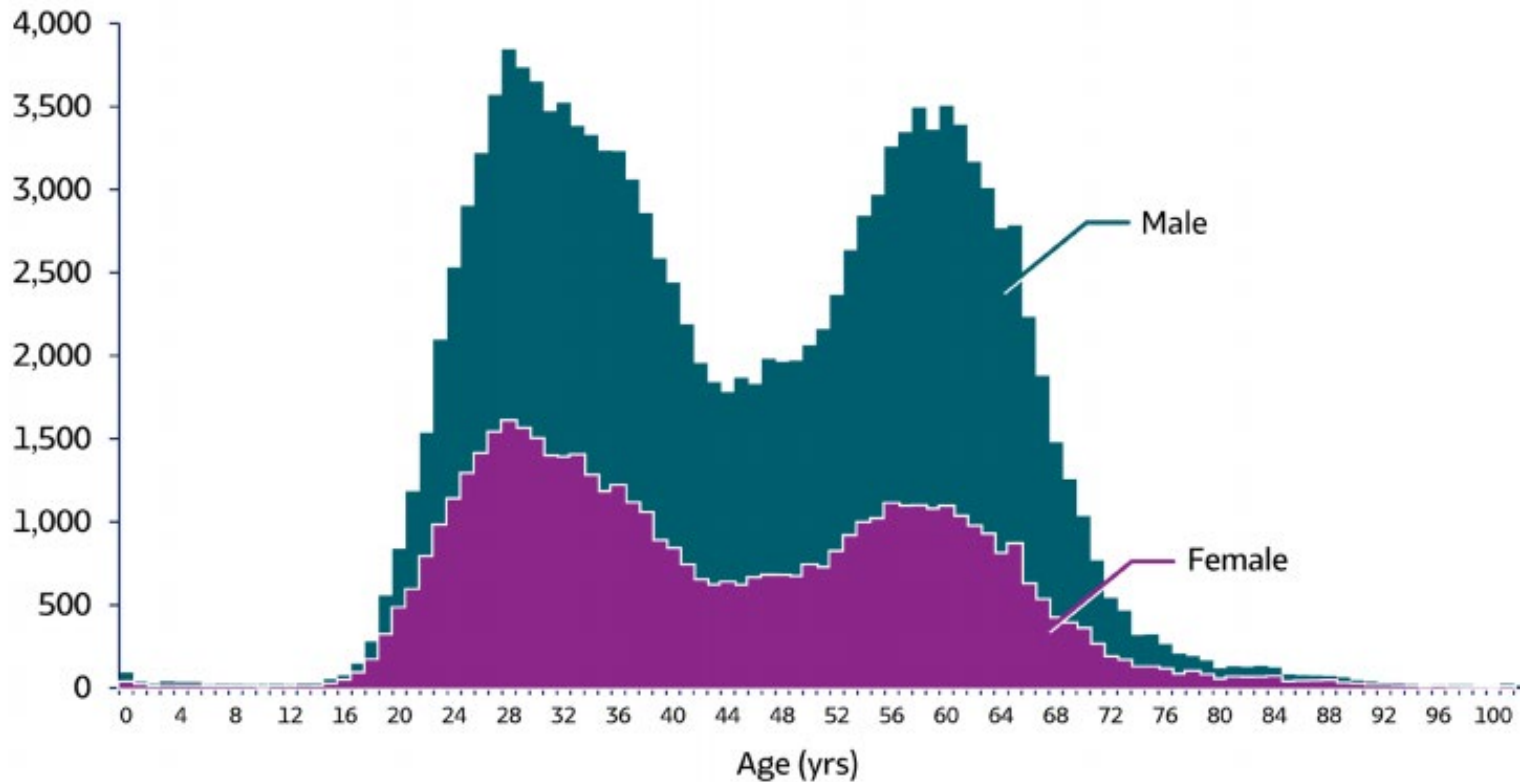
Prevalence of HCV by Year of Birth



HCV Affecting Persons in 20-39 yrs 65% of Acute Cases



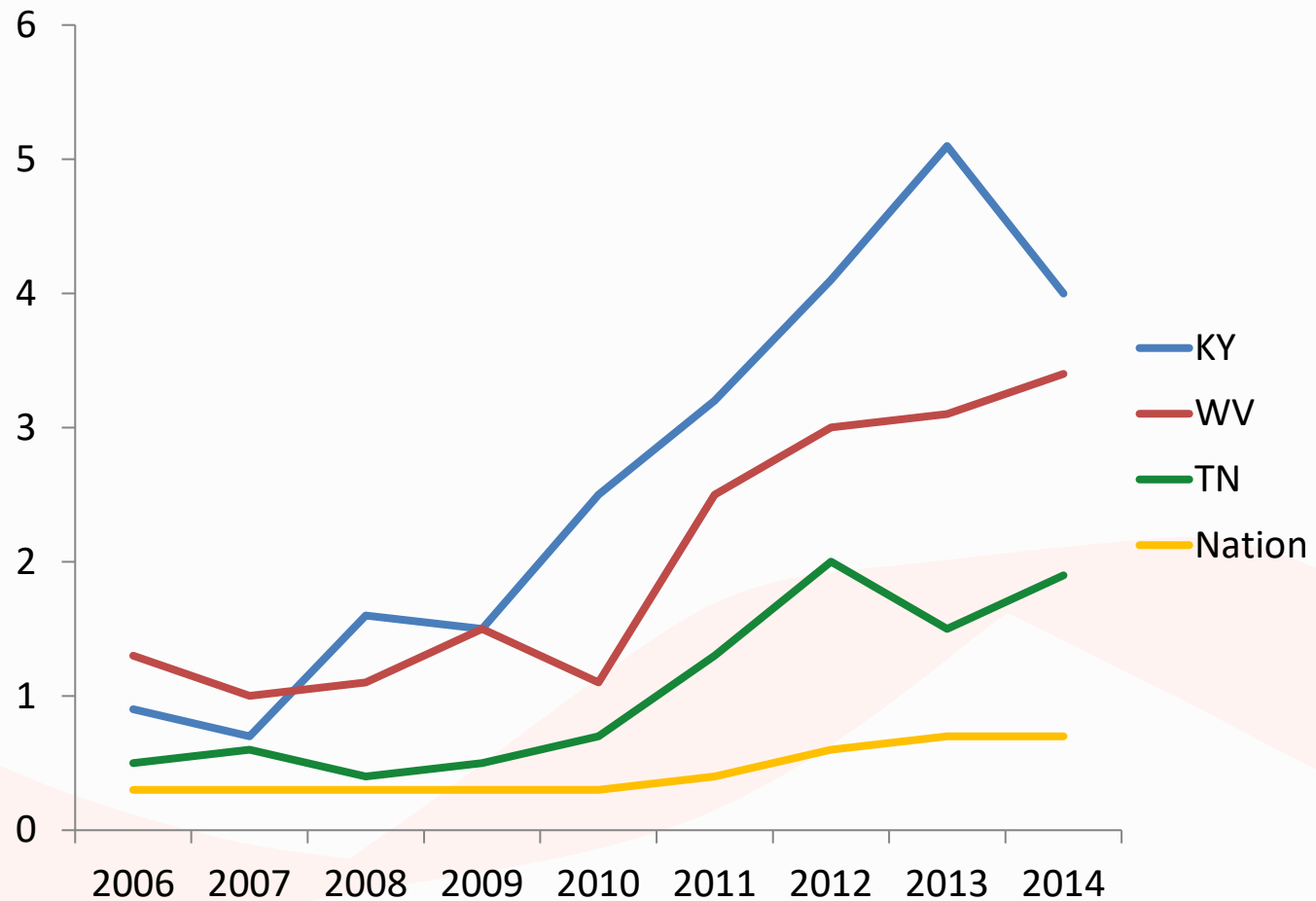
Bimodal Age Distribution



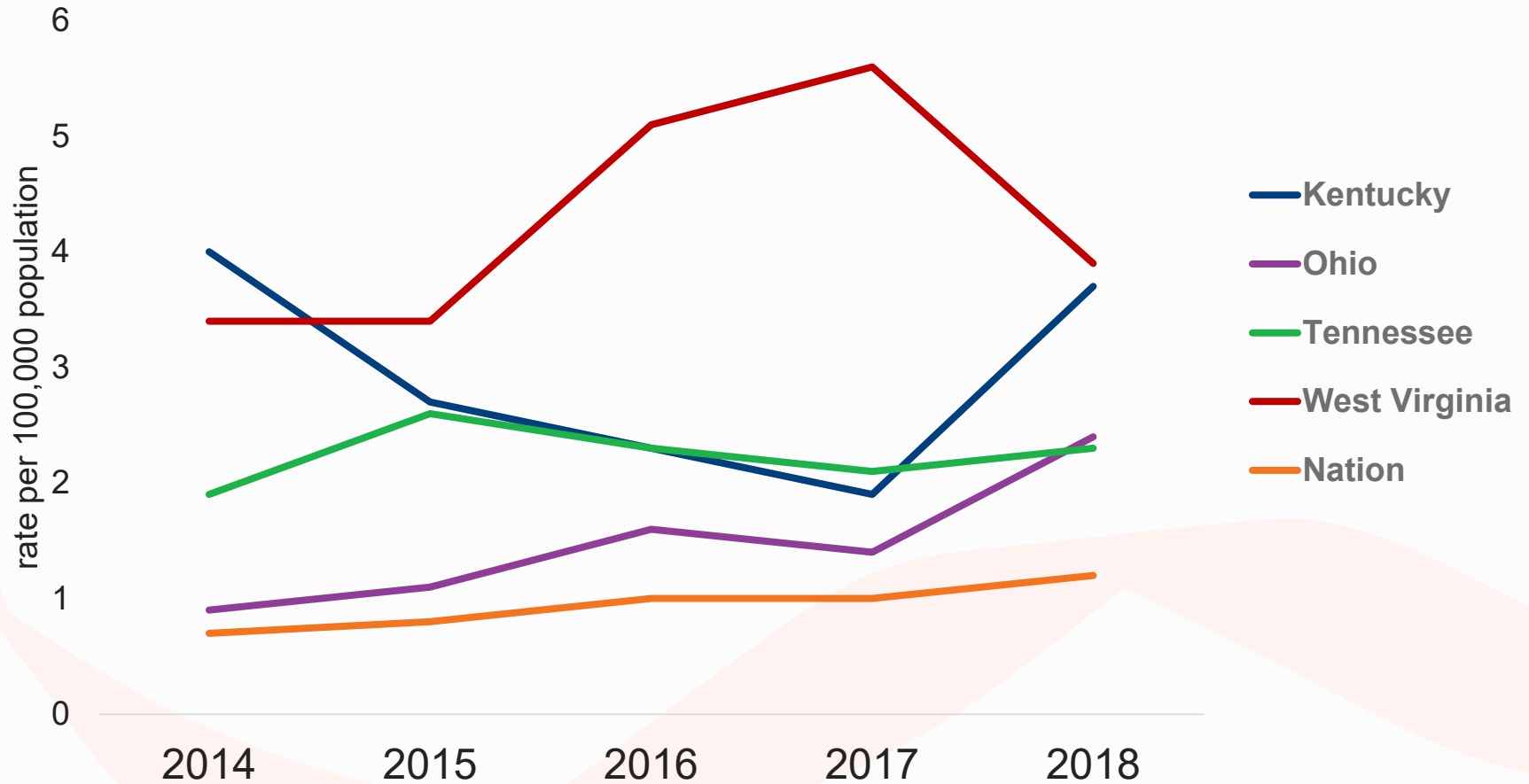
Which State Had the Highest Acute HCV Rate in 2018?

- A. California
- B. Florida
- C. Kentucky
- D. New York

Incidence of Acute Symptomatic HCV per 100,000 population

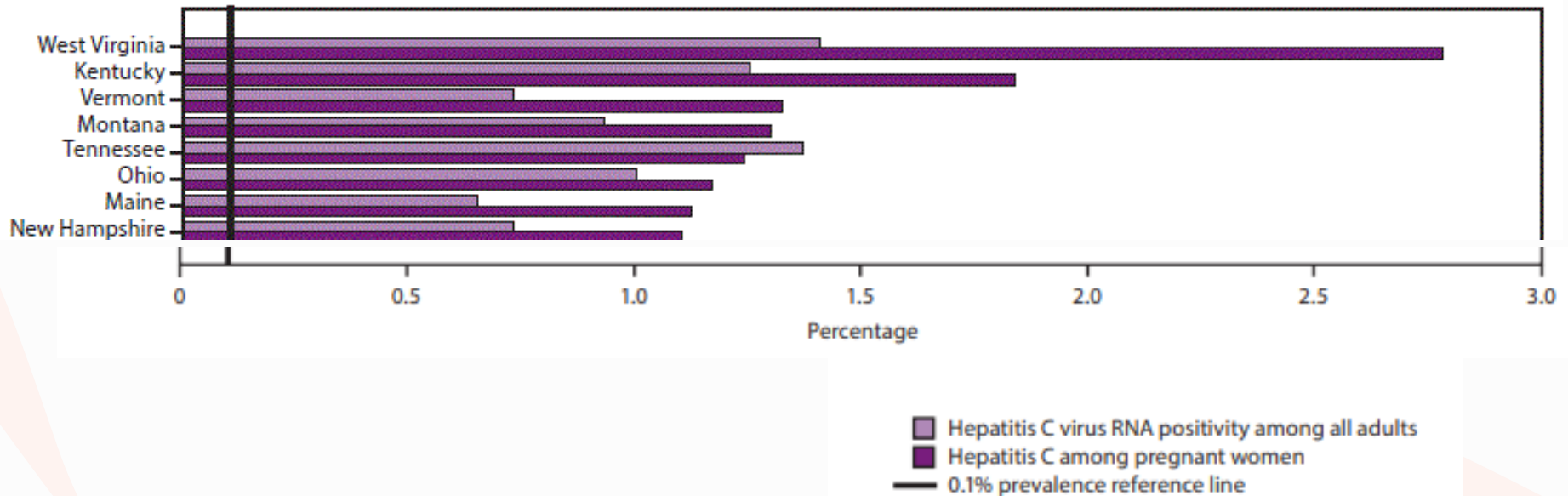


Rate of Acute HCV by State



Prevalence of Chronic HCV

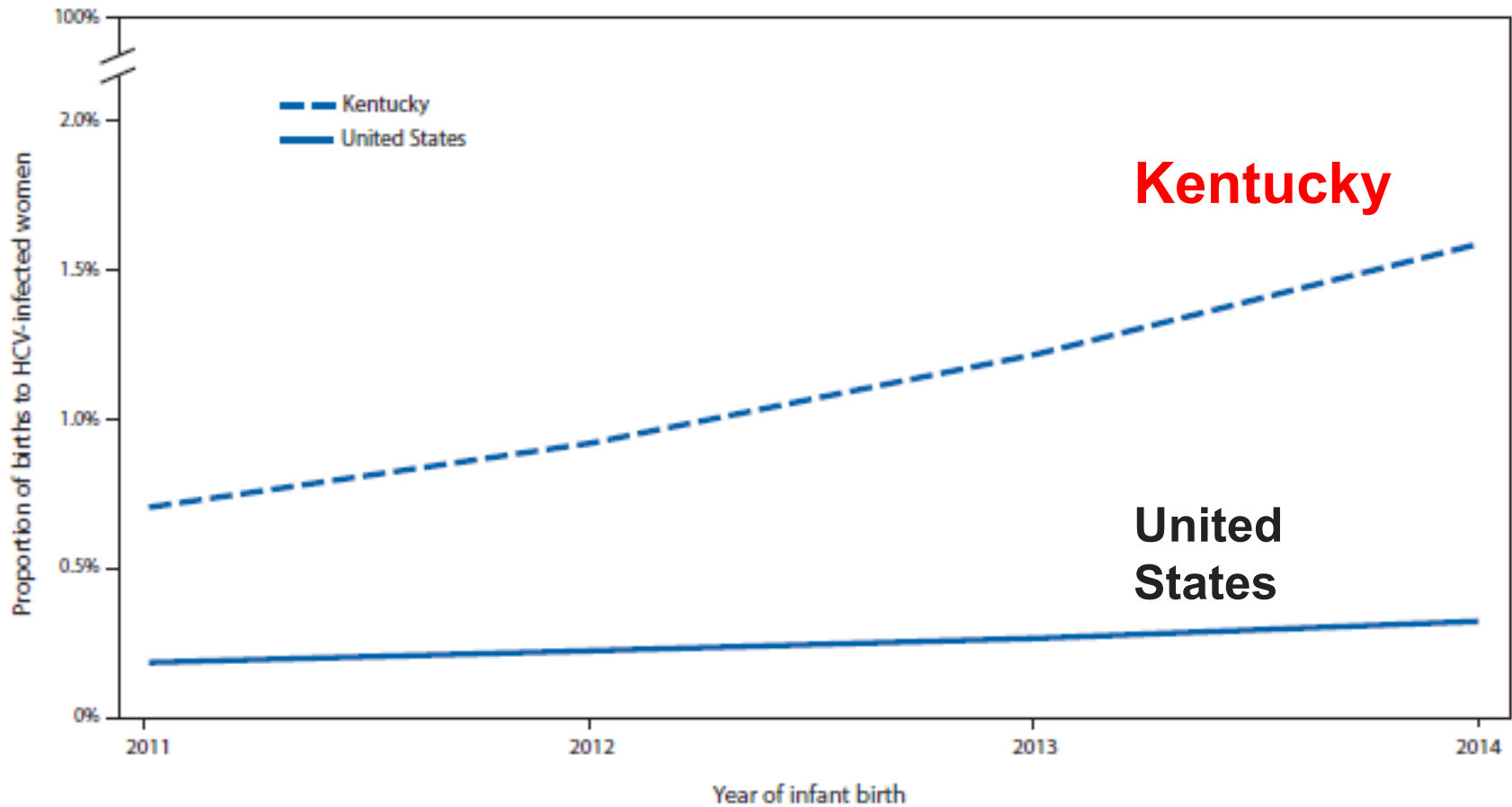
Estimated HCV RNA positivity based on 2013–2016 NHANES



Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965



Proportion of Infants Born to HCV-infected Women



Screening Progressively Expanded

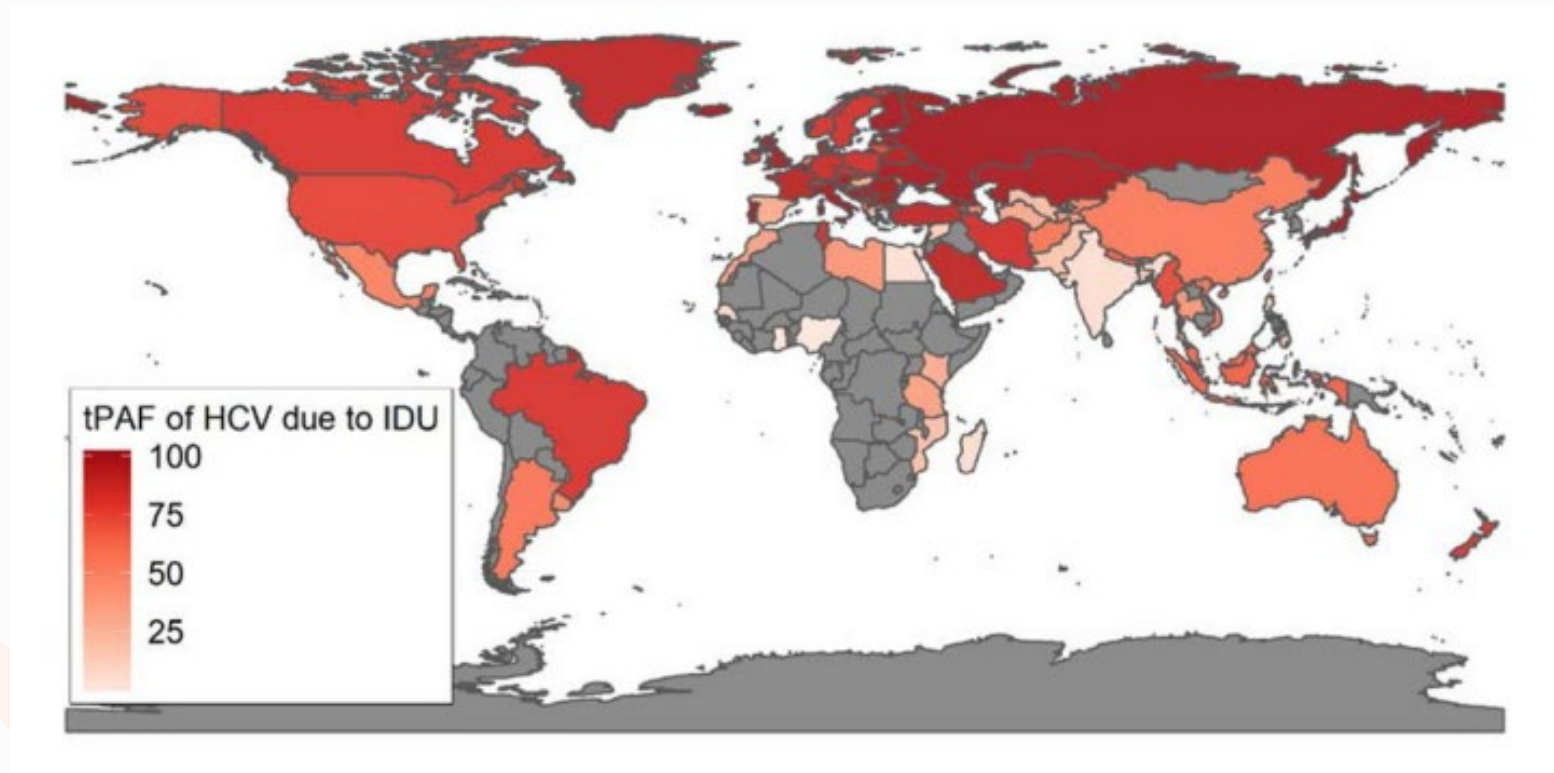
- 1998: risk-based screening
- 2012: one-time screening for persons born in the 1945-1965 birth year cohort regardless risk factors
- 2018: universal screening during pregnancy
- 2020: at least once in a lifetime for all adults ≥ 18 years

High Risk Populations

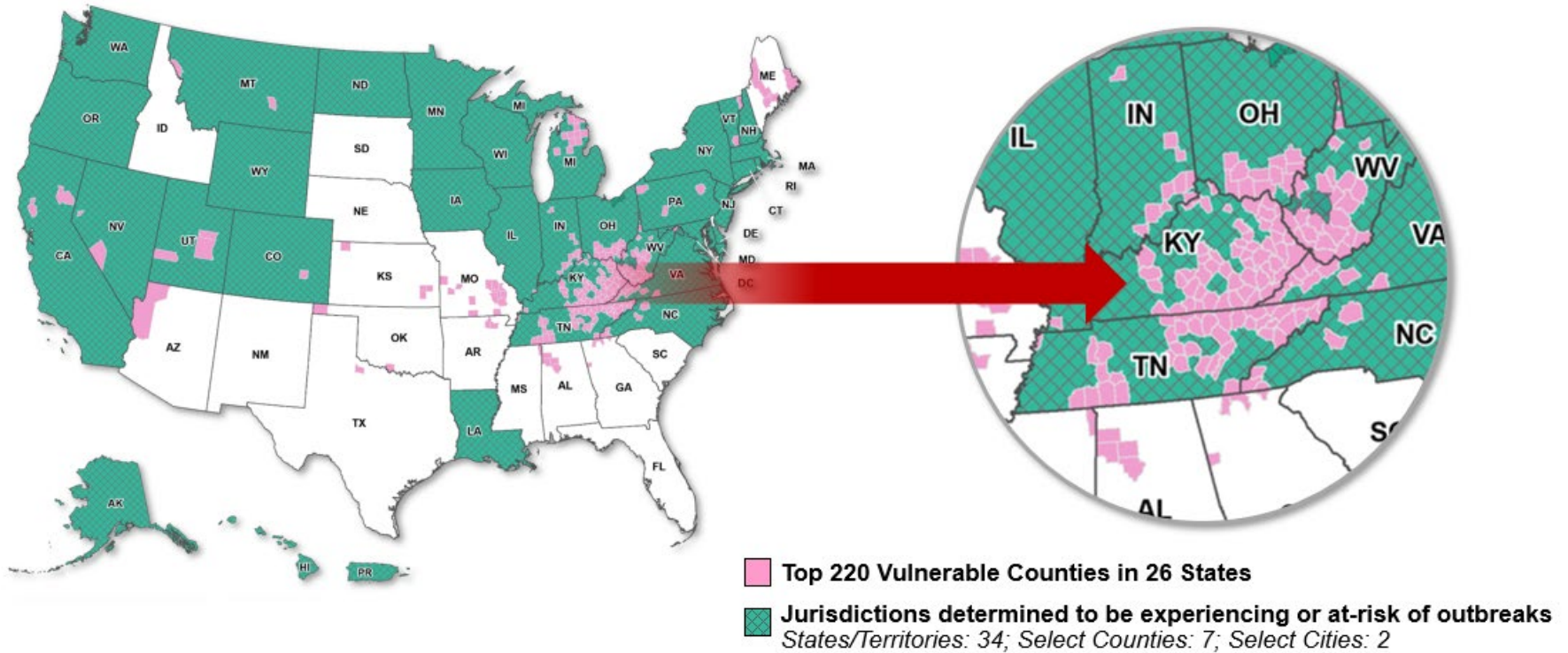
Population	Prevalence of HCV antibody %
General population	1.7%
Birth cohort	3.3%
Emergency Departments	7.5%
PWUD	54.2%

HCV in PWID

Injection Drug Use Attributable to HCV Transmission



At Risk Counties



HCV and IDU in Kentucky A Local Snapshot

PWID and HCV Prevalence Estimates

4,468,000 Kentuckians

Estimated 113,200 PWID in Kentucky

Estimated 77,850 PWID with HCV in Kentucky

Estimated 38,925 PWID with HCV who are unaware of their status

At Annual PCP Visit

A 54-year-old man comes to the clinic for his routine annual examination. His only known medical problem is HTN. He is married and has four children. He denies any history of drug use, history of STD, or receipt of blood or blood product. He is a high school teacher. He was born in 1960. He has never been tested for HCV.

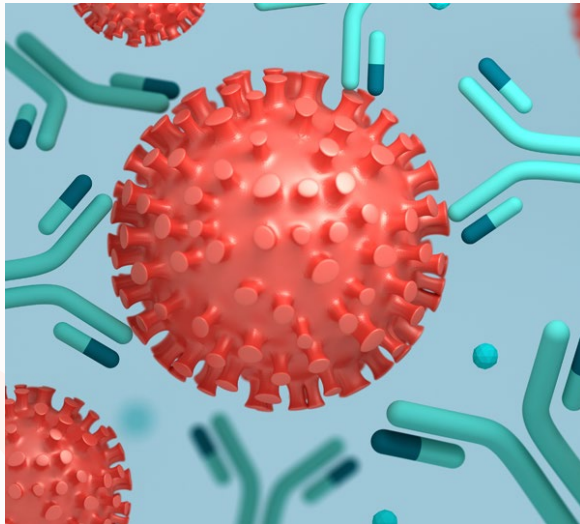
Which One of the Following Would You Recommend to This Patient Regarding Testing for HCV?

- A. HCV test is not recommended because he has no risk factors
- B. HCV test is not recommended because he has no symptoms or signs of HCV infection
- C. He should have one-time testing for HCV
- D. He should have yearly HCV testing

How to Diagnose Hepatitis C

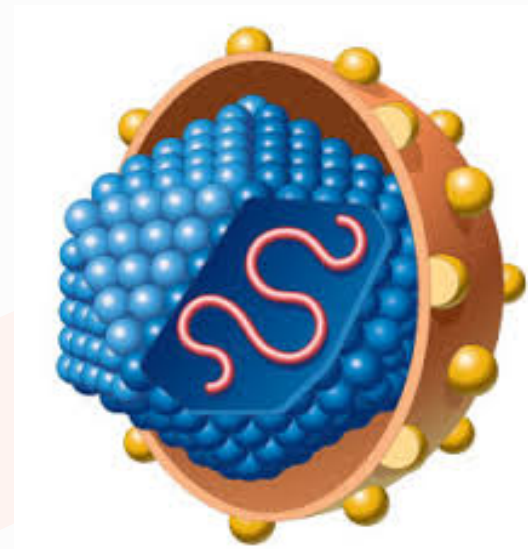
Antibody

Indicates past or current infection

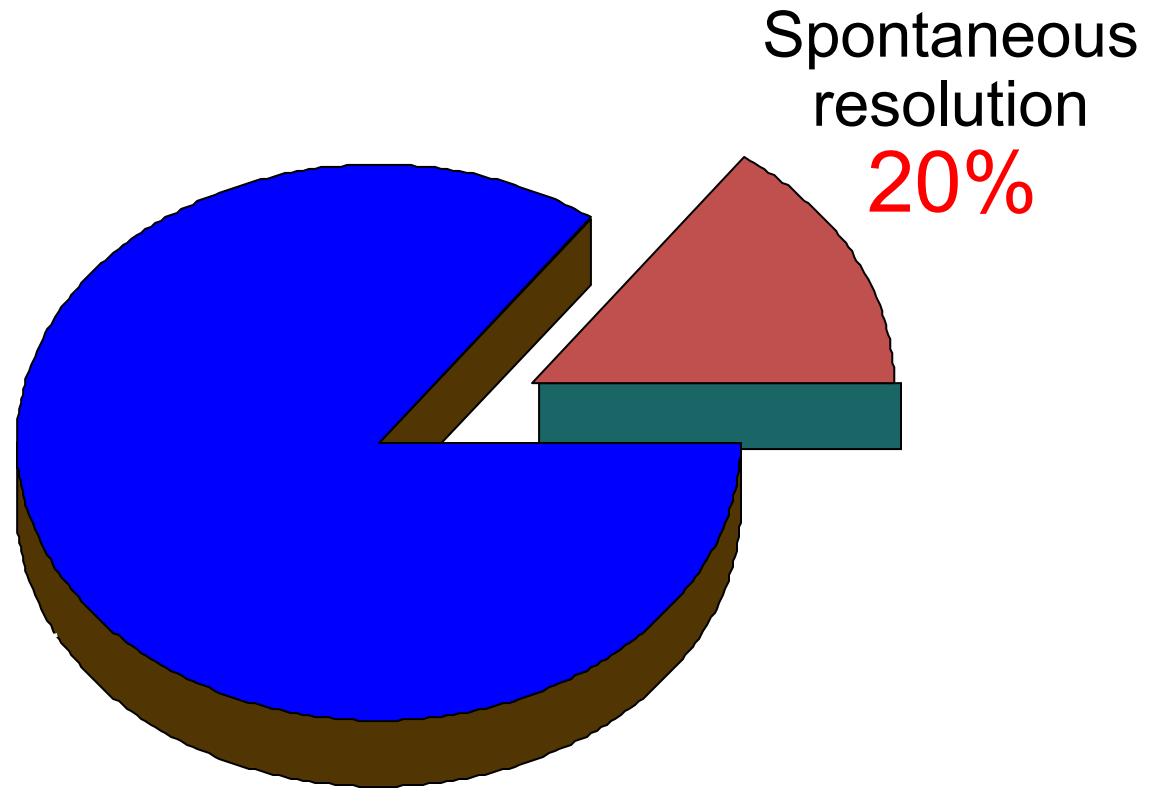


RNA test (PCR)

Indicates current infection



Fate of Acute HCV Infection



HCV antibody was positive. What would you recommend as the next step?

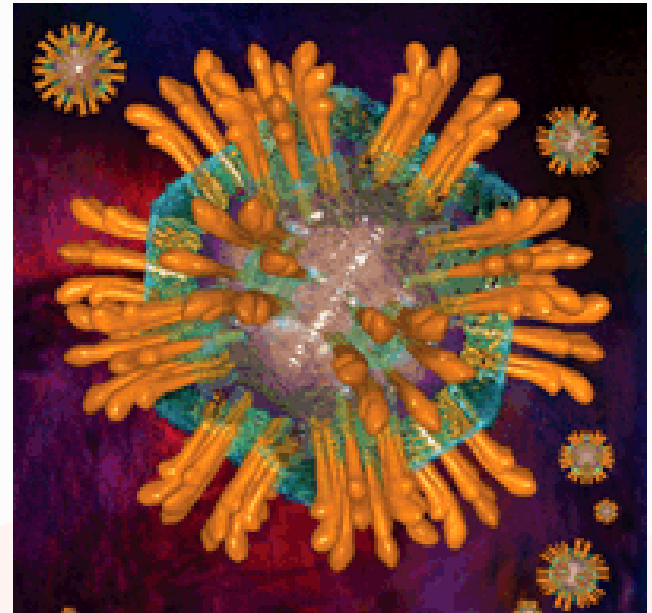
- A. Repeat HCV antibody test
- B. Perform an RNA assay
- C. Order Western Blot test
- D. Refer to a specialist

How to Diagnose Hepatitis C

- Step 1: HCV antibody test
- Step 2: HCV RNA test
- Step 3: Evaluation and management

Virology

- Enveloped, single-stranded, positive-sense RNA virus
- Discovered in 1989
- The causative agent for the majority of non-A non-B hepatitis



How Is HCV Transmitted?

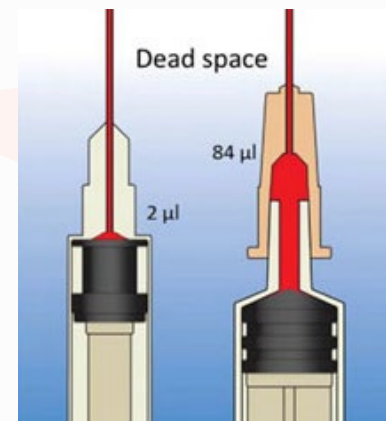
■ Blood

- IDU
 - Blood transfusion before 1992
- Sexual transmission is uncommon
 - 1 per 190,000 sexual contacts
- Mother to child- 2-5%
- Tattooing

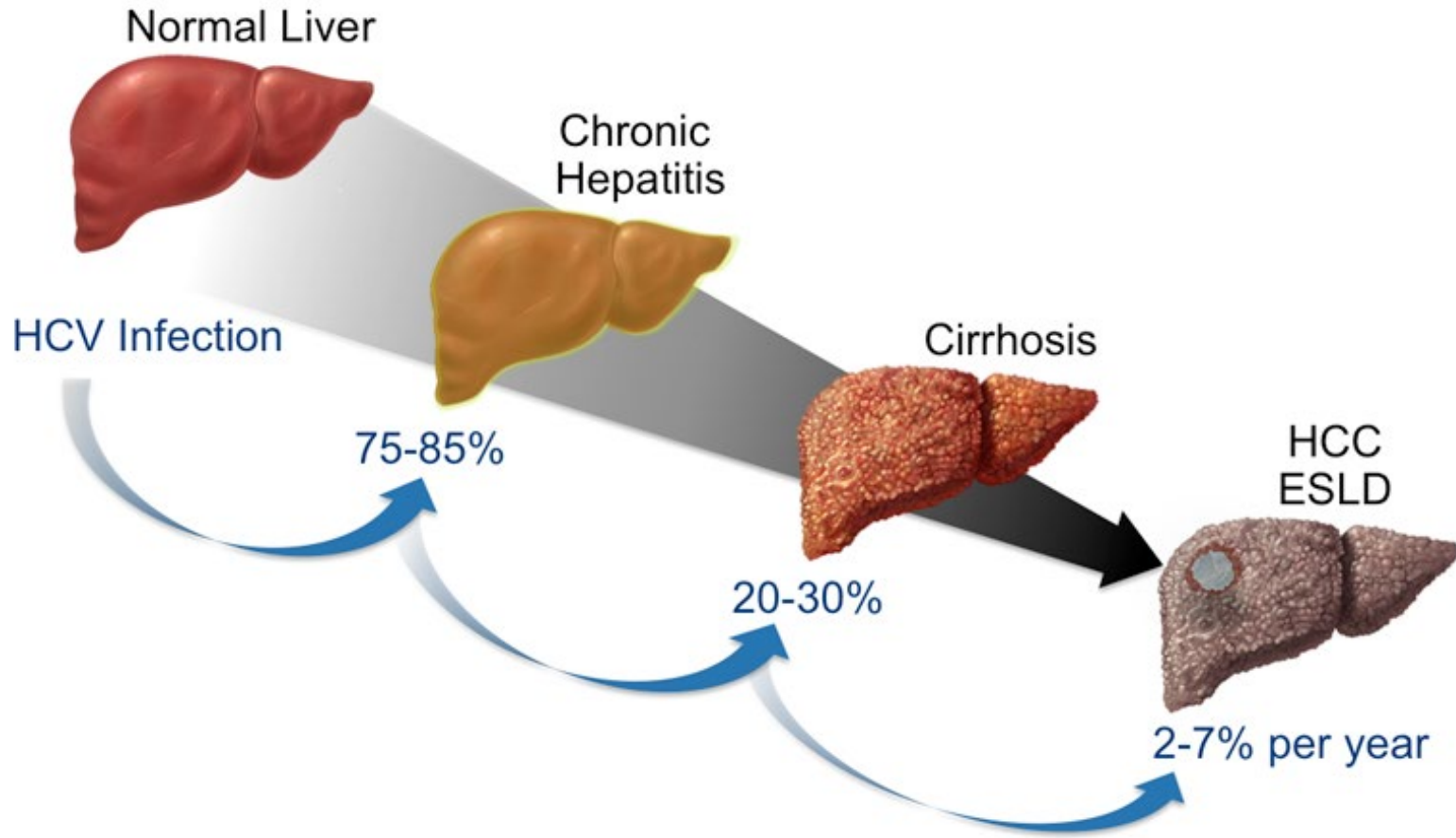


PWID at Risk for HCV

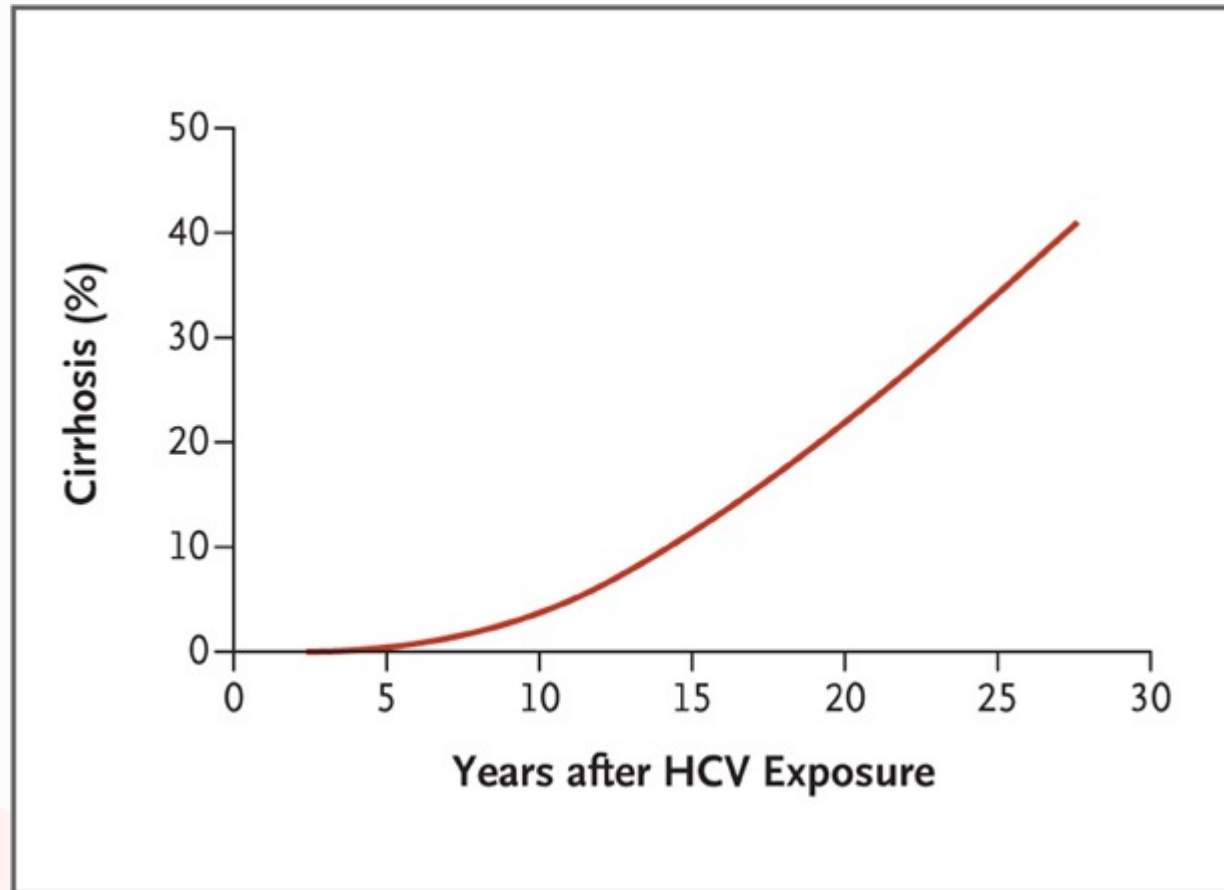
- IDU is the primary HCV transmission risk factor
- 1 year after injection initiation: HCV cumulative incidence is $\geq 28\%$
- HCV rapidly circulates within networks of PWID
 - Associated with reuse of contaminated equipment: needles, syringes, cookers, filters
- Other injection-related risk factors
 - High injection frequency
 - Use of high dead-space syringes



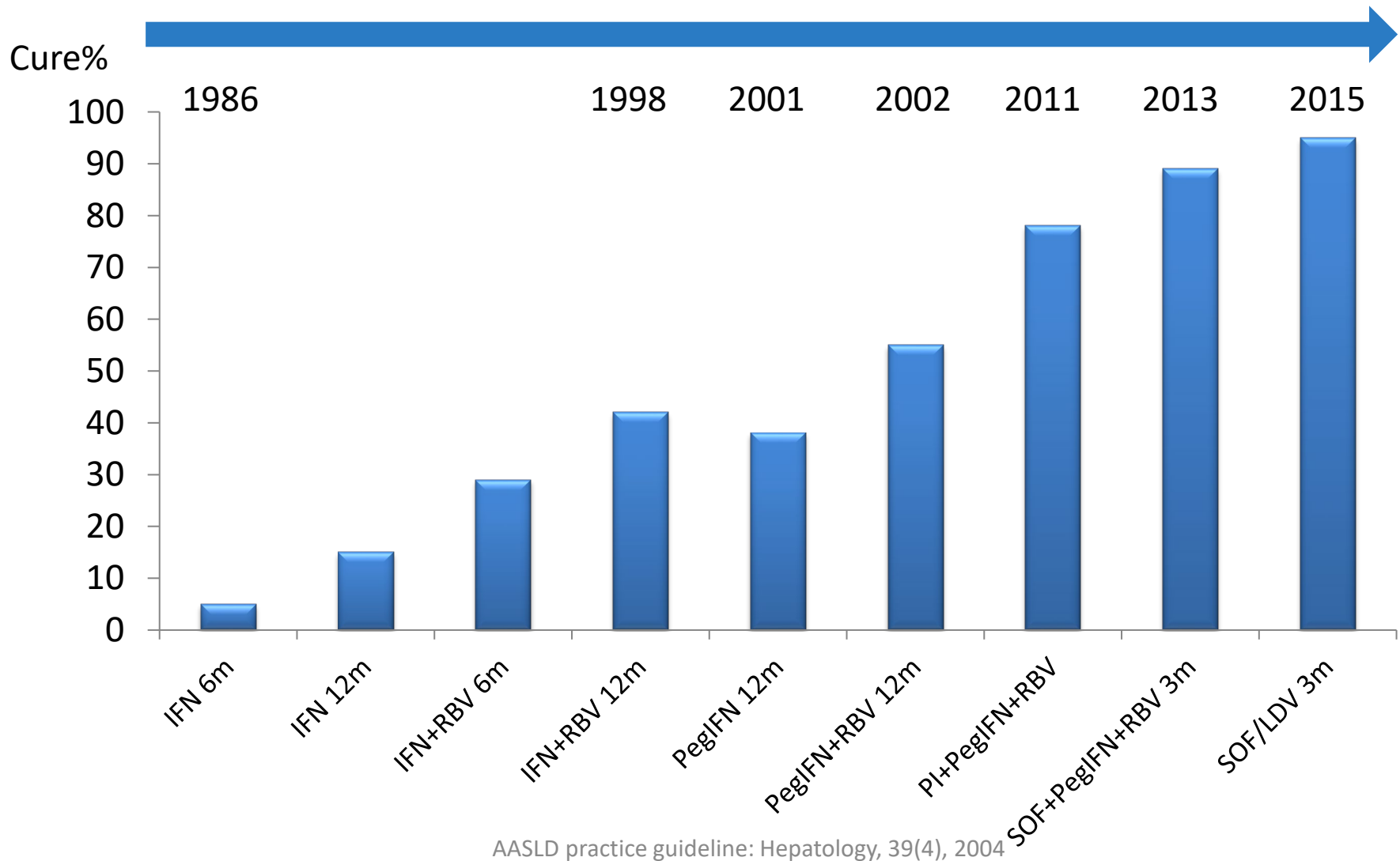
Natural History of HCV



HCV Progresses Slowly Over 20-40 Years

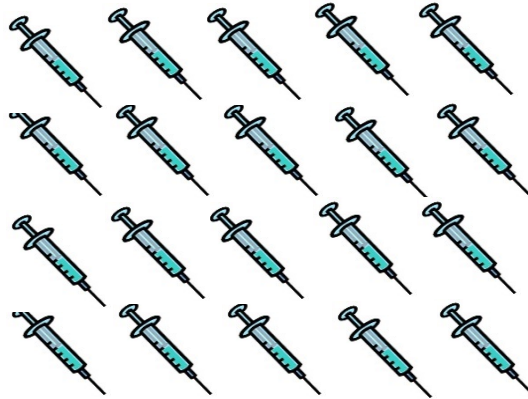


Milestones in HCV therapy



Then and Now

48 injections



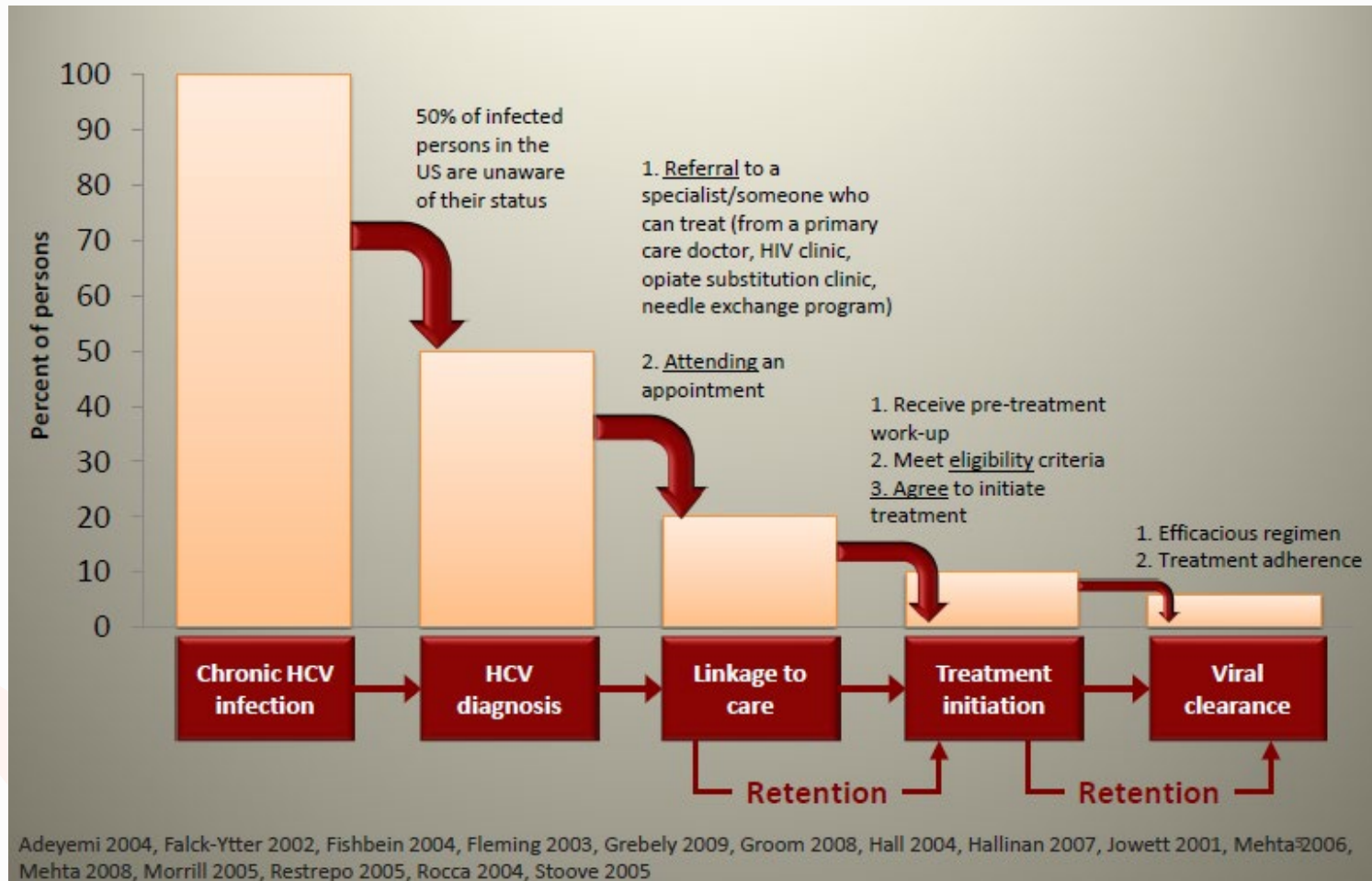
As few as
56 pills

+

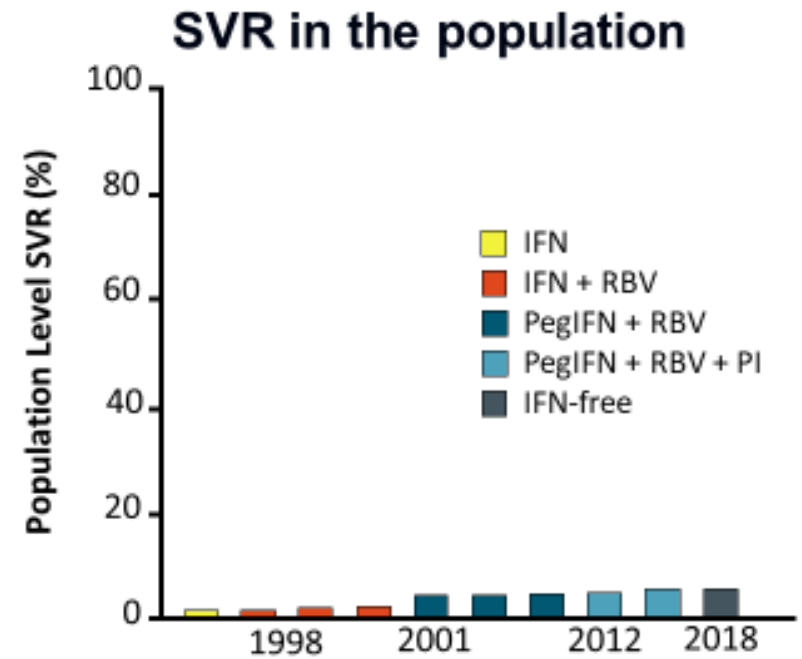
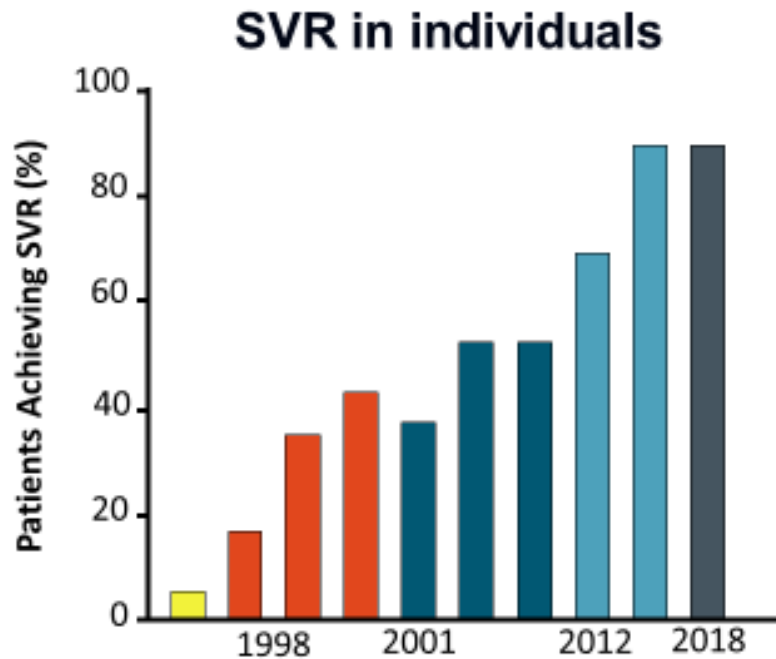
As many as
6048 pills



>95% of HCV Curable, But Only A Small Fraction Was Cured



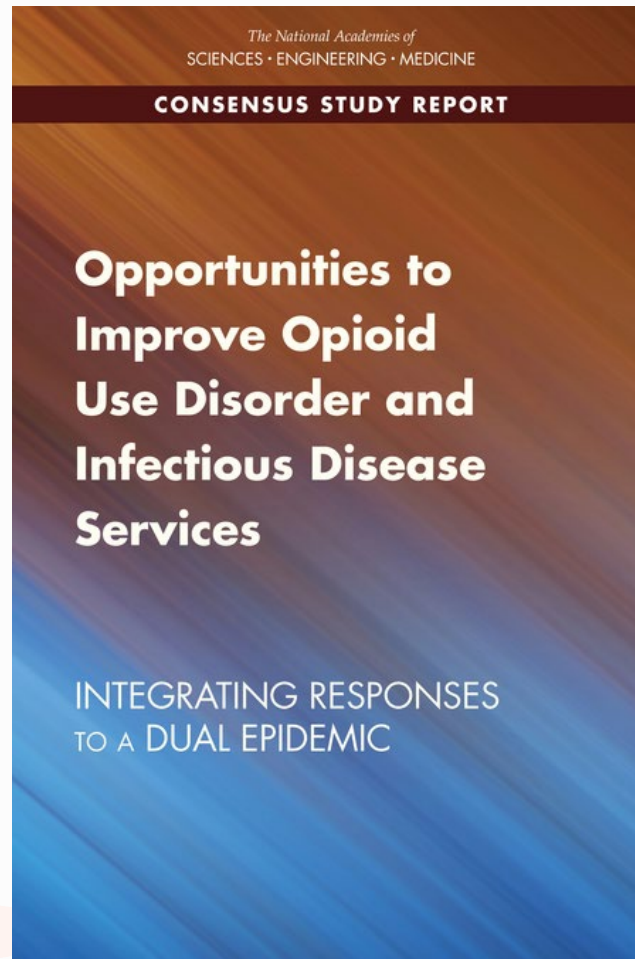
HCV Elimination Requires More Than Good Drugs



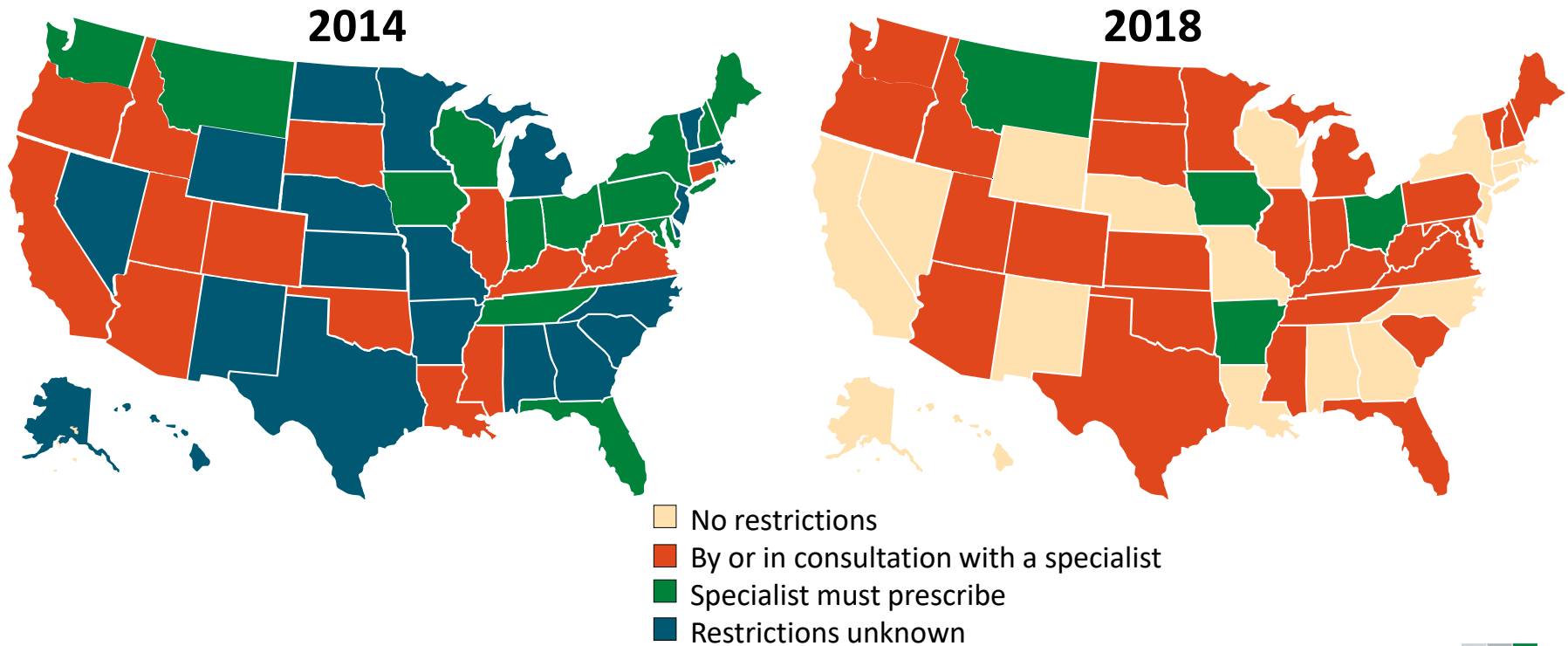
Grebley. JID. 2013;207(S1):S19.

Slide credit: clinicaloptions.com

Bring Care to Where They Are Integrated Services



Prescriber Restrictions Lifted in The Most of States



CHLPI and NVHR at <https://stateofhepc.org/>.

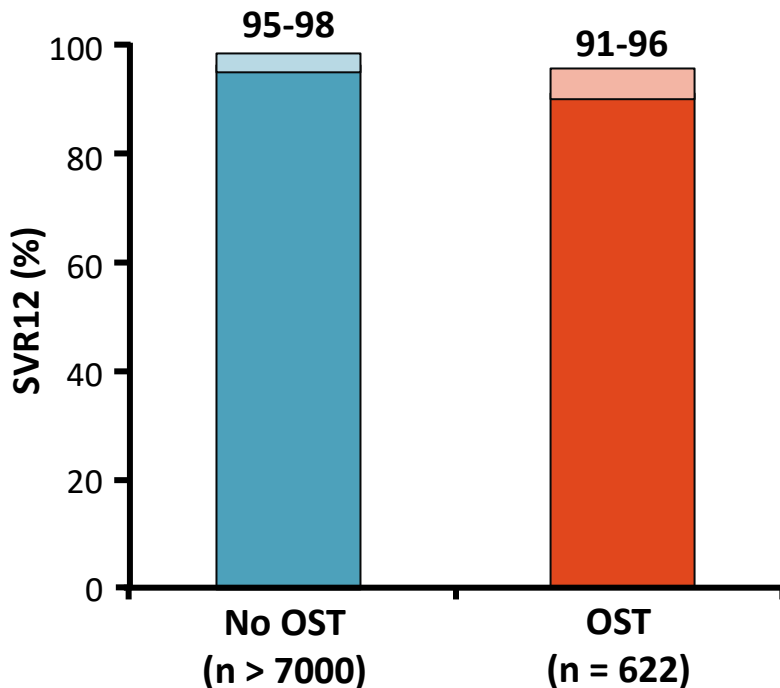
Slide credit: clinicaloptions.com

Task Shifting to Non-specialists

Cure Rate, by Provider Type

Subgroup	Patients, <i>n/N</i>	Cure (95% CI), %
Overall	516/600 ^a	86.0 (83.0-88.7)
PROVIDER TYPE		
NP	134/150	89.3 (83.3-93.8)
PCP	139/160	86.9 (80.6-91.7)
Specialist	243/290	83.8 (79.0-87.8)

SVR Rates High Among PWID, Even With Ongoing IDU



SVR12 rates also > 90% among patients with current/recent IDU

- 90.4% in C-EDGE CO-STAR (n = 136)
- 94% in SIMPLIFY (n = 102)
- 98% in pooled analysis from 6 phase III trials (mITT; n = 63)

HCV Treatment Was Simplified

	Conventional	Simplified
Pretreatment assessment	Labs, US, Elastography	A few labs
Regimens	Several genotype specific regimens	2 pangenotypic drugs
On-treatment monitoring	Visits and labs at week 2, week 4, week 8, and week 12	Optional for most of the patients

One-Stop Shop

Integrated Care Model

- Nurse-driven care model
 - Partner with an offsite specialist who supervises clinical visits through teleconferencing
- Onsite PCP or MAT provider model
 - Onsite providers receive training via teleconference
 - Offsite specialist available for consultation/co-management

Q&A

Please email me, tsuga2@uky.edu if you are interested in learning about HCV management more

Thank you!