

The Medical Consequences of the Injection Opioid Epidemic in Rural West Virginia

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Disclosure

- an active research grant and a pending research grant from Gilead Sciences (vertical transmission of hep C, HIV PrEP in PWID)

We are not only dealing
with an epidemic of opioid
injection drug use.....

Multiple Injection Opioid Syndemics (intertwined epidemics)

- acute hepatitis C (*WV has 2nd highest US rate*)
- acute hepatitis B (*WV has highest US rate*)
- hepatitis A among homeless persons/people who inject drugs (*2547 cases from 3/19/18-8/30/19, 4th highest US rate with 23 deaths*)
- endocarditis and other serious bacterial infections (osteomyelitis, CNS & visceral abscesses, etc)
- mother-to-child transmission of hepatitis B, C, HIV
- HIV outbreaks in Huntington & Charleston

Multiple Injection Opioid Syndemics (intertwined epidemics)

- syphilis and other STDs, incl. congenital syphilis
- overdoses and OD fatalities (*WV is #1*)
- Neonatal Opioid Withdrawal Syndrome (NOWS)/
Neonatal Abstinence Syndrome (NAS)[babies born in
withdrawal from maternal opioid use] (*WV has highest
rate*)
- increasing shift to stimulant use, esp methamphetamine,
and polypharmacy with fentanyl & other drugs

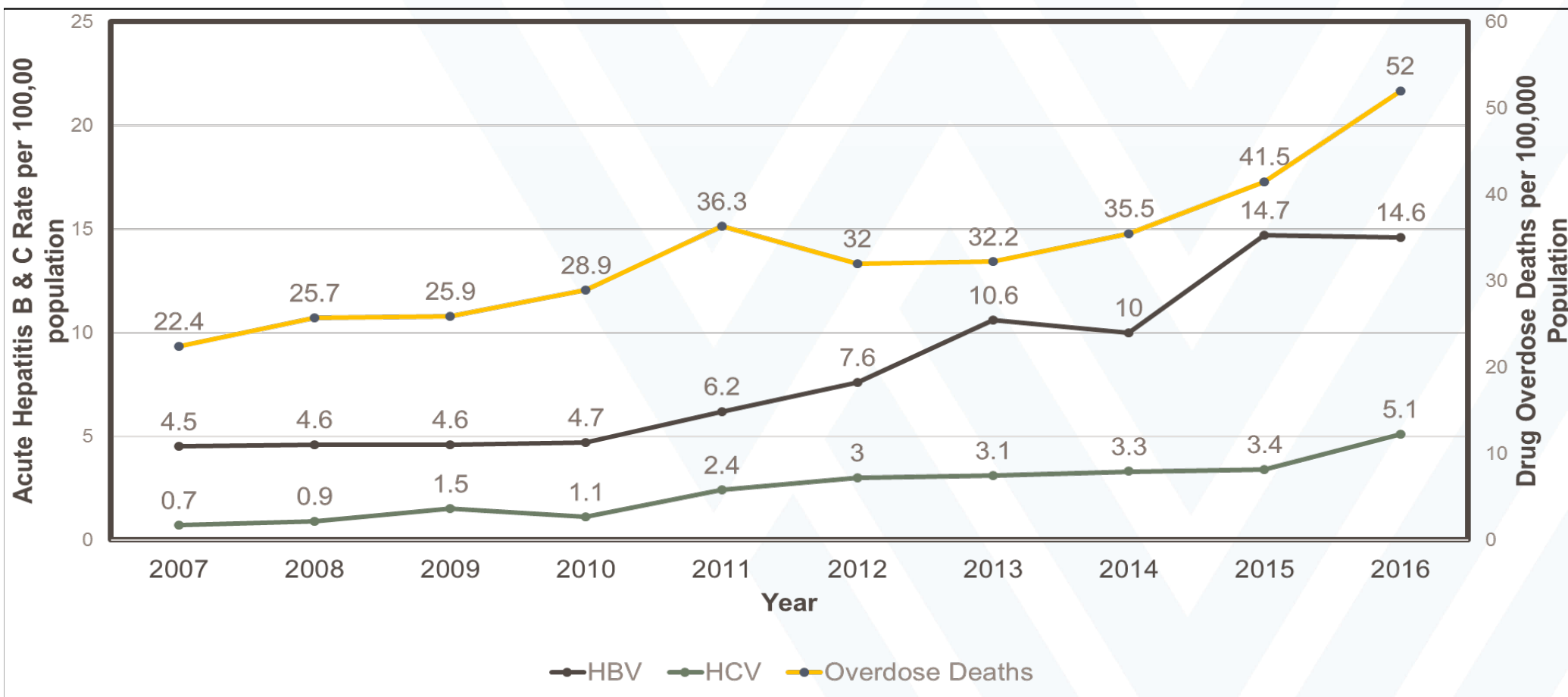
Similar Risk Factors for HIV, HBV & HCV

Risk factor	HIV	HBV	HCV
unprotected sex	+	+	++
injection drug use	+	+	+
tattoos, piercings, needlesticks	+	+	+
hemodialysis	+	+	+
transfusion/organ transplant	+	+	+
foodborne		+	
household contact		+	
institutionalized		+	

*primarily among MSM

*more common among MSM

Incidence Rate of Acute Hepatitis B & Hepatitis C by Year of Report & Age-adjusted Drug Overdose Mortality Rate — West Virginia, 2007-2016



Data sources: WV Office of Epidemiology and Prevention Services, Centers for Disease Control and Prevention, Drug Overdose Death Rates, Centers for Disease Control and Prevention, Viral Hepatitis Statistics and Surveillance

Acute HCV in Appalachian Youth ≤ 30 , 2006-2012

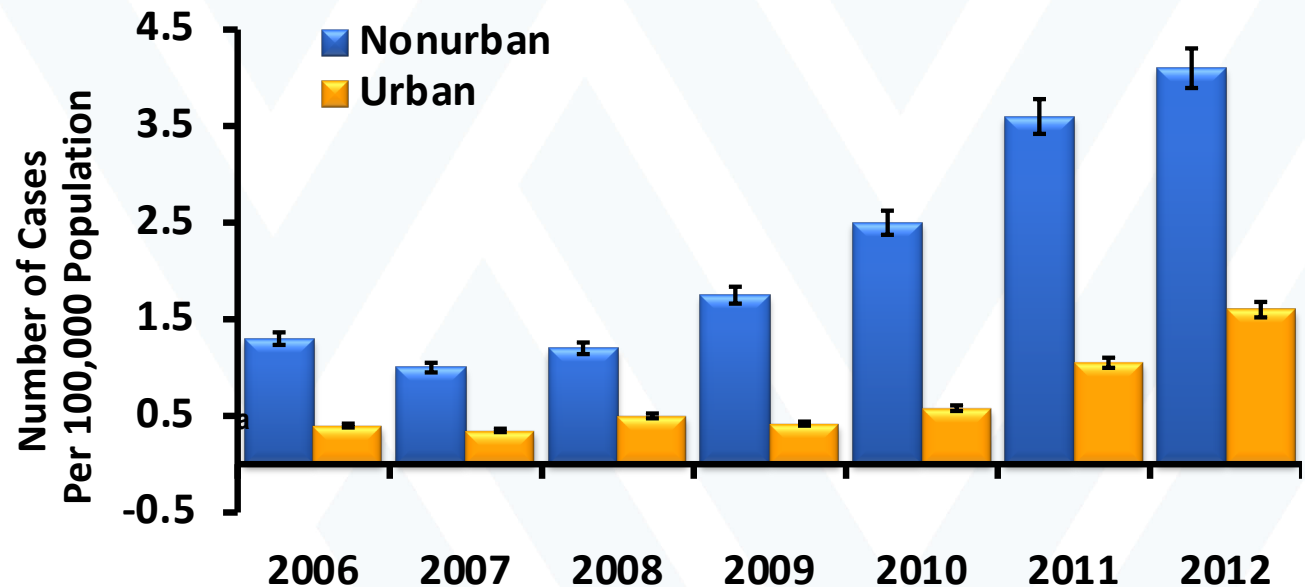
- 1,377 cases in WV, VA, TN, KY
- represents **346% increase**
- tied to opioid injection among whites in rural & small urban areas
- IDU was risk factor in 73%

Zibbell JE et al. MMWR Weekly May 8, 2015

HCV Infection: Urban vs Nonurban^{1,2}

The first few years after onset of injection drug use constitute a high-risk period in which the rate of HCV infection can exceed 40%³

Incidence of Acute HCV Among Persons ≤30 years, by Urbanicity and Year¹



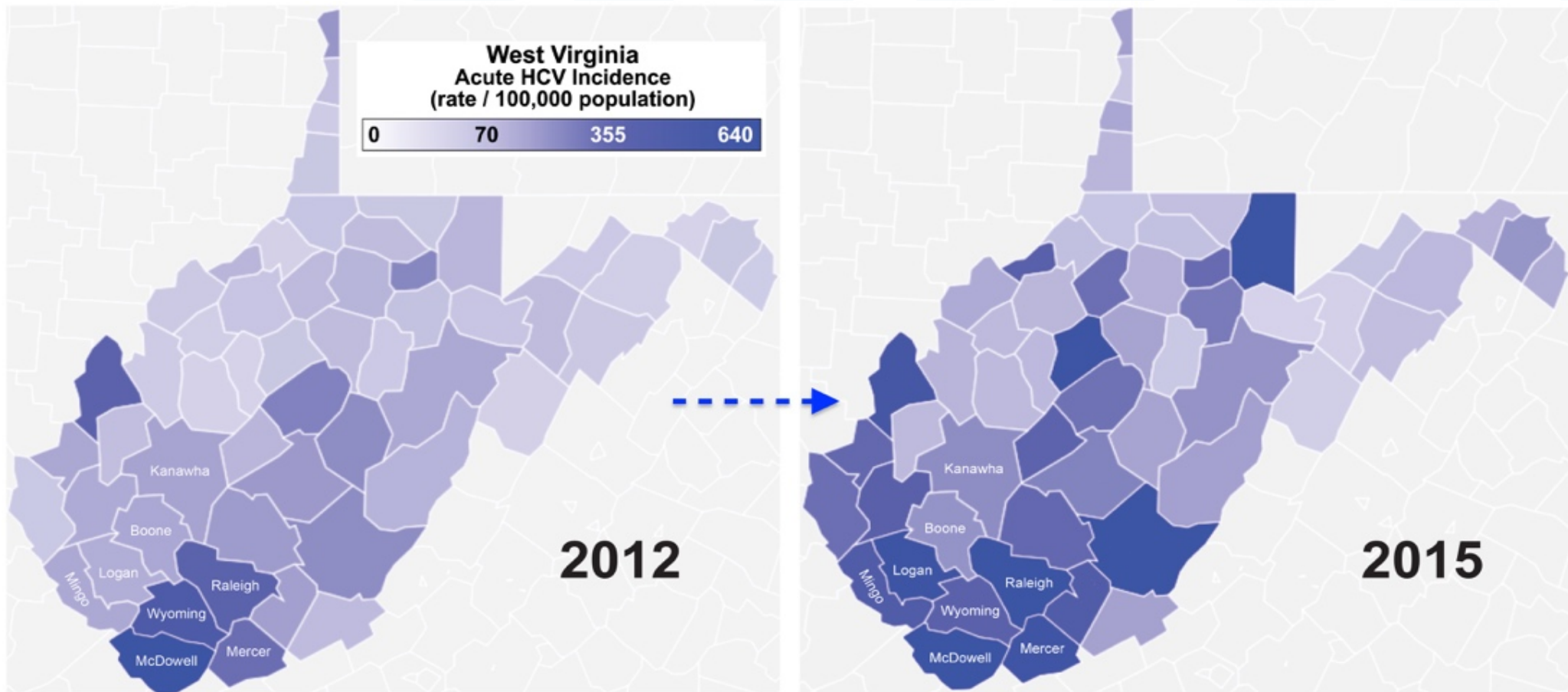
^a95% confidence interval.

1. Zibbell J, et al. *MMWR. Morb Mortal Wkly Rep.* 2015;64(17):453-458; 2. Suryaprasad AG, et al. *Clin Infect Dis.* 2014;59(10):1411-1419;

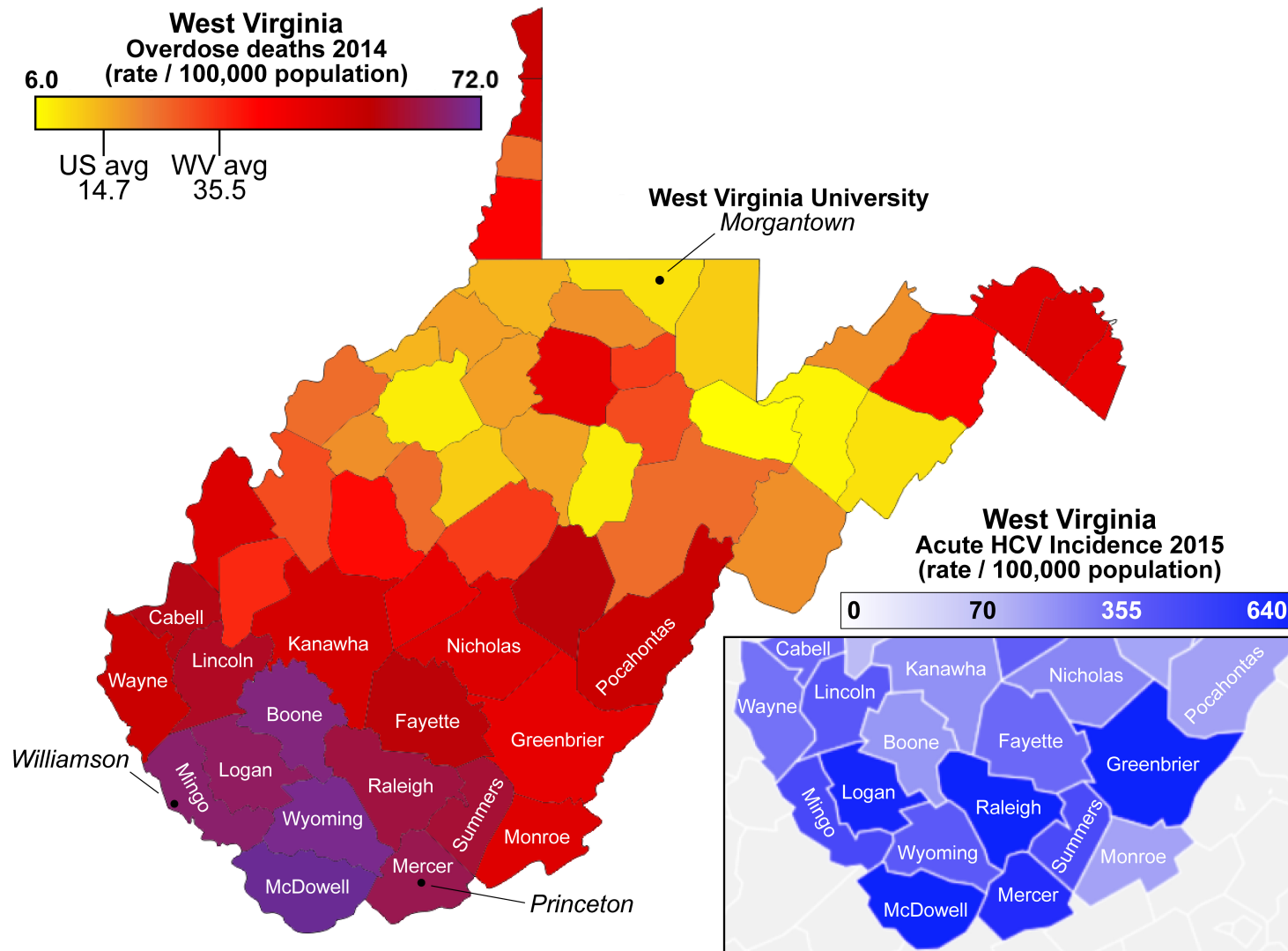
3. Colvin HM, Mitchell AE, eds. *Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C.* 2010.

<https://www.cdc.gov/hepatitis/pdfs/iom-hepatitisandlivercancerreport.pdf>. Accessed April 8, 2018.

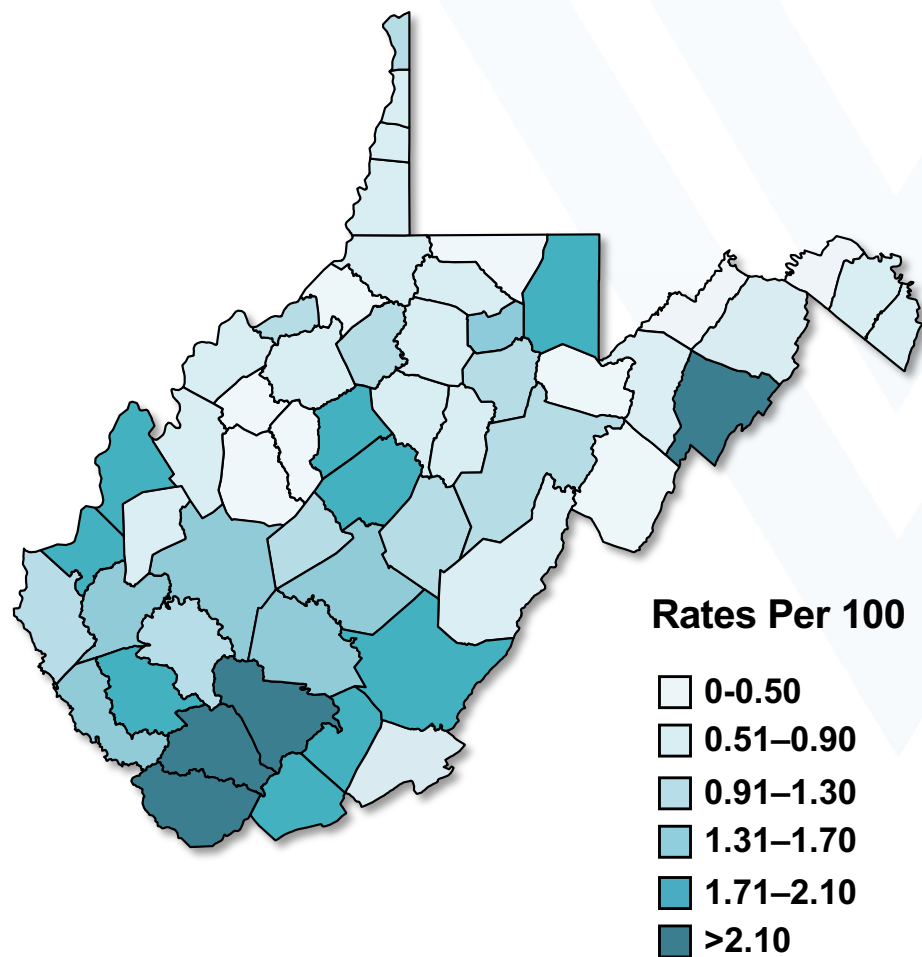
Rapid Increase in Acute HCV



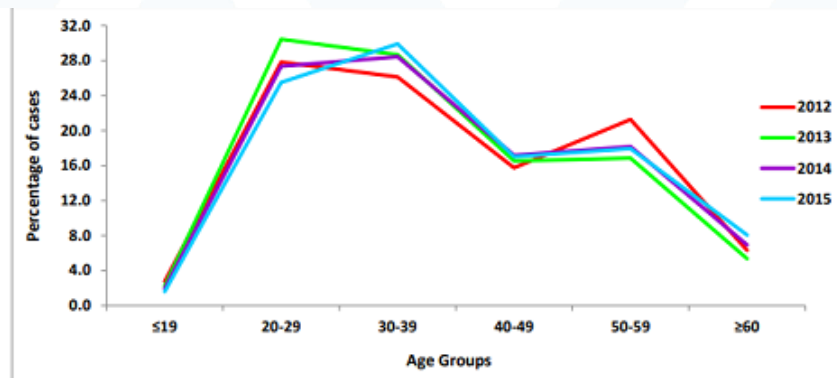
Overdose Mortality (2014) & Acute HCV (2015)



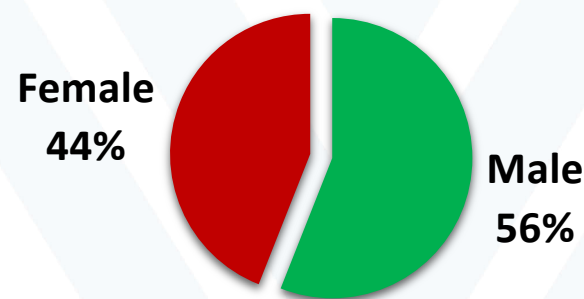
West Virginia: Chronic HCV, 2012-2015



Distribution of Chronic HCV Cases by Age Group, % WV, 2012-2015, N=21,307



Distribution of Chronic HCV Cases by Gender, % WV, 2012-2015. N=21,276



West Virginia (WV) Department of Health and Human Resources (DHHR). West Virginia Viral Hepatitis B and C Surveillance. 2016. <http://dhhr.wv.gov/oeps/disease/viral-hepatitis/documents/Hepatitis-Report-2016.pdf>. Accessed April 8, 2019.

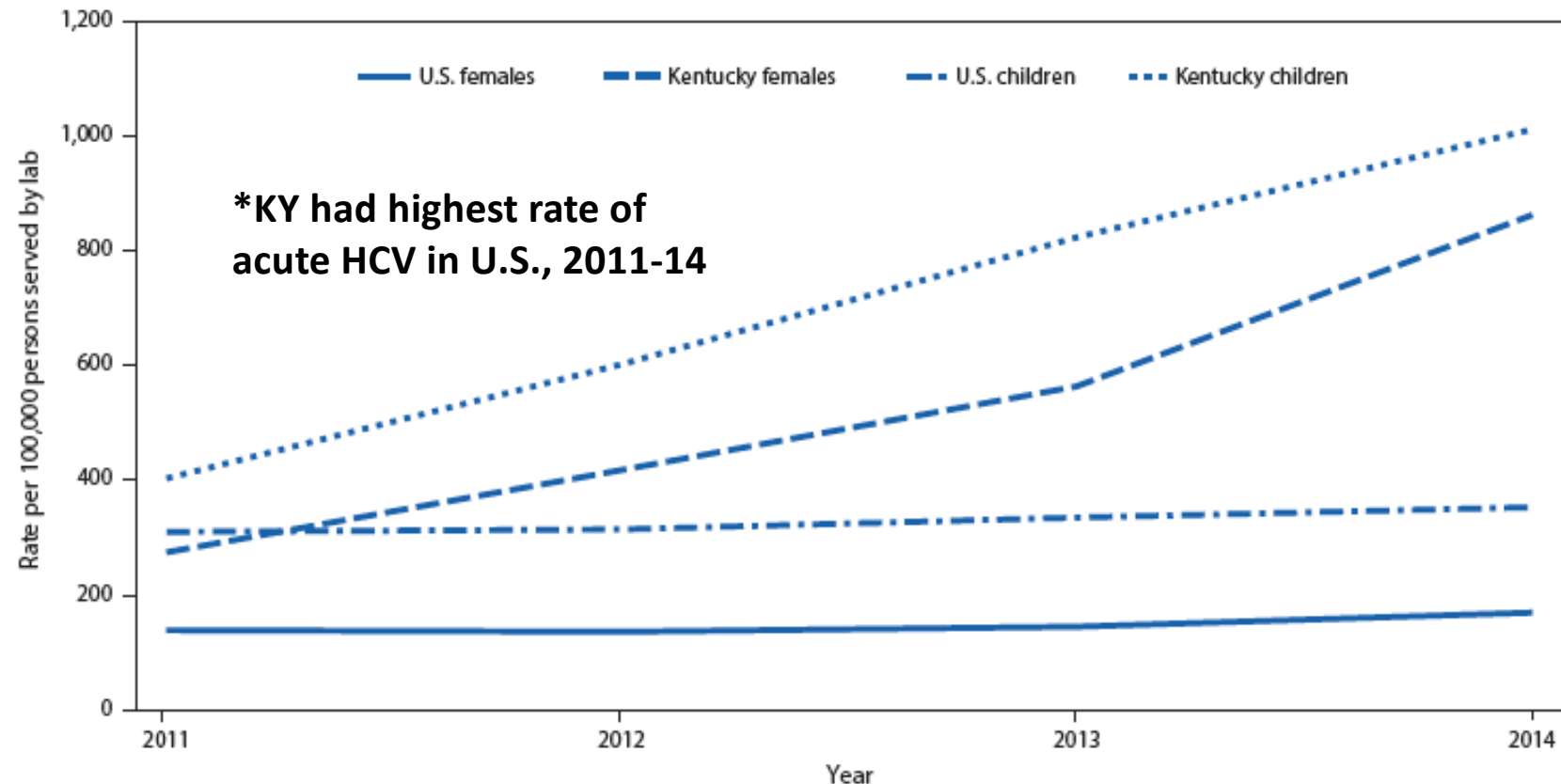
Transmission Routes for HIV, Hepatitis B & C

	HIV	Hepatitis C	Hepatitis B
blood	++	++	++
sex	++	+*	++
mother-to-child	++	+	+++

*primarily among MSM

HCV in women of child-bearing age & in children <2 y/o, KY 2011-14*

FIGURE 1. Hepatitis C virus (HCV) detection rate among females aged 15–44 years and HCV testing rate among children aged ≤2 years — United States and Kentucky, 2011–2014*

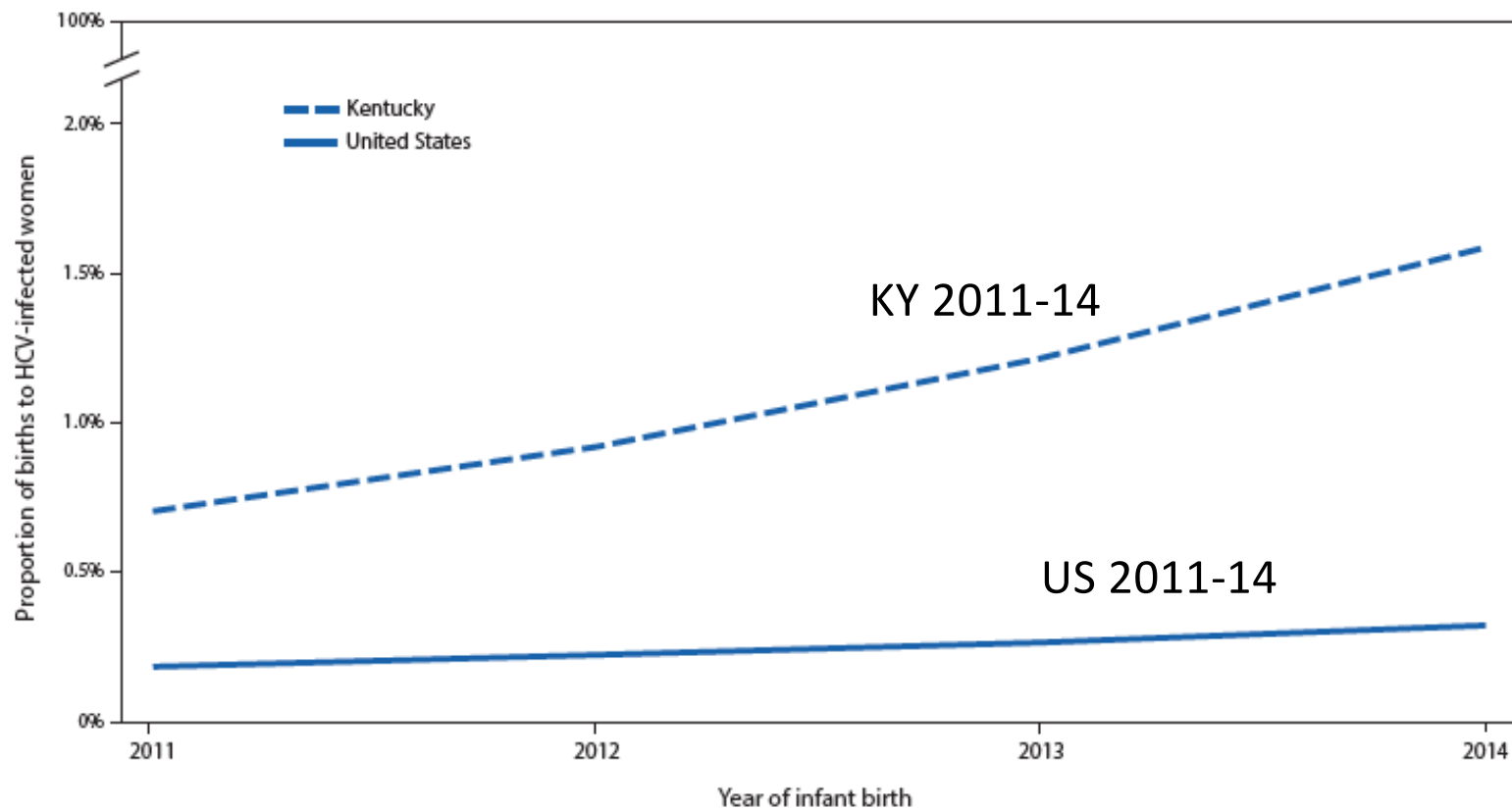


Source: Quest Diagnostics laboratory data.

* HCV detection rates were calculated as number of females aged 15–44 years who received a positive HCV antibody and/or RNA result per 100,000 females aged 15–44 years served by Quest Diagnostics (i.e., received a laboratory test for any reason) by area of residence. HCV testing rates among children were calculated as number of children aged ≤2 years who received a test for HCV antibody and/or RNA per 100,000 children aged ≤2 years served by Quest Diagnostics by area of residence.

Increasing Proportion of Infants Born to Hep C-infected Moms

FIGURE 2. Proportion* of infants born to hepatitis C virus (HCV)-infected women† — United States and Kentucky, 2011–2014

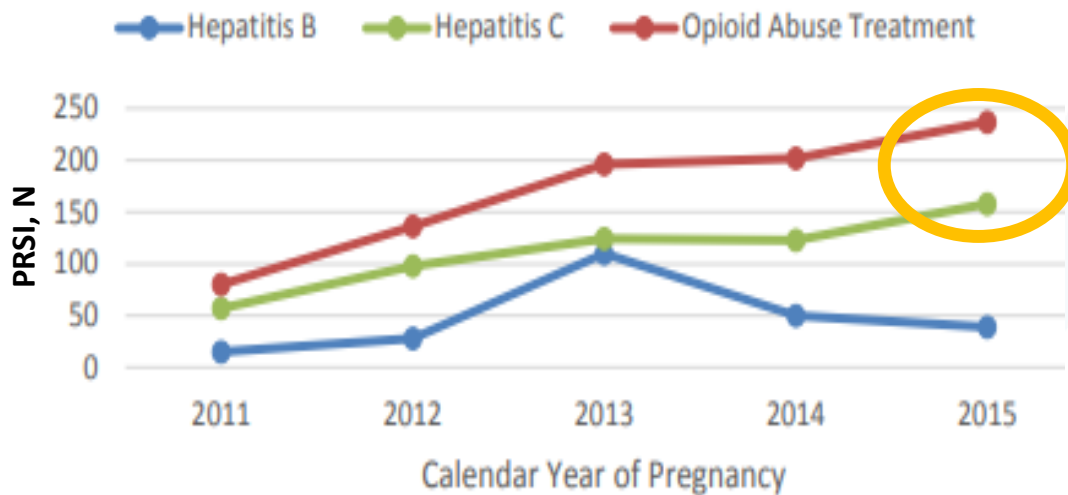


* Proportion calculated annually as infants born to HCV-infected women divided by total infants born.

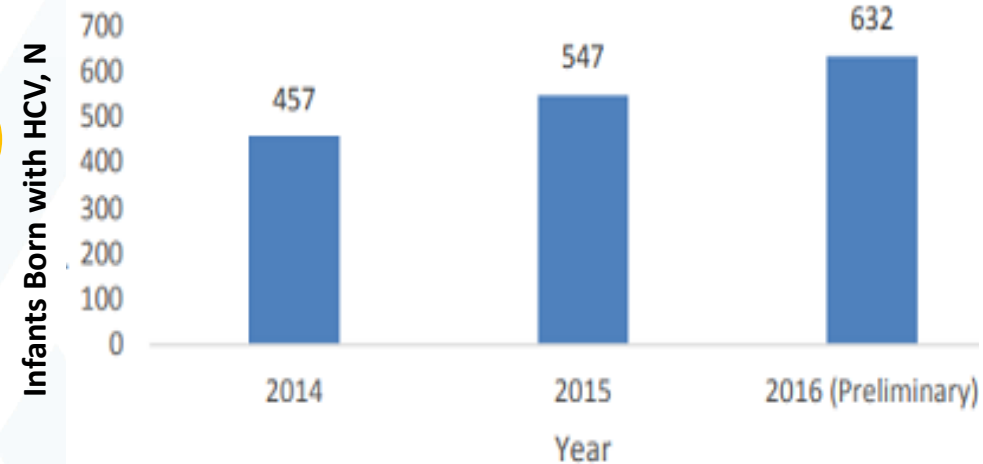
† HCV infection status of mother is determined by notation on infant's birth certificate. Birth categorization is based on mother's place of residence.

Vertical HCV Transmission in WV: 2014-2016

Hepatitis Infection or Related Risk Factor in Current Pregnancy, 2011–2015¹



Infants Born with HCV, 2014–2016²



**West Virginia had the highest infant HCV infection rate in 2014:
22.6 cases per 1,000 live births³**

PRSI, Pregnancy Risk Screening Instrument.

¹WVDHHS. West Virginia Viral Hepatitis Epidemiologic Profile 2017. 2017. <https://dhhr.wv.gov/oeps/disease/ob/documents/viral-hep-profile-2017.pdf>. Accessed April 8, 2019; ²WVDHHR. Viral Hepatitis B and C Surveillance 2012–2015. <http://dhhr.wv.gov/oeps/disease/viral-hepatitis/documents/Hepatitis-Report-2016.pdf>. Accessed April 8, 2019; ³US ³Department of Health and Human Services. 2017. Increases in Maternal Hepatitis C Mirrors the Rise in Injection Drug Use. <https://www.hhs.gov/hepatitis/blog/2017/01/12/increase-in-maternal-hepatitis-c-infections-mirrors-rise-in-injection-drugs.html>. Accessed April 8, 2019.

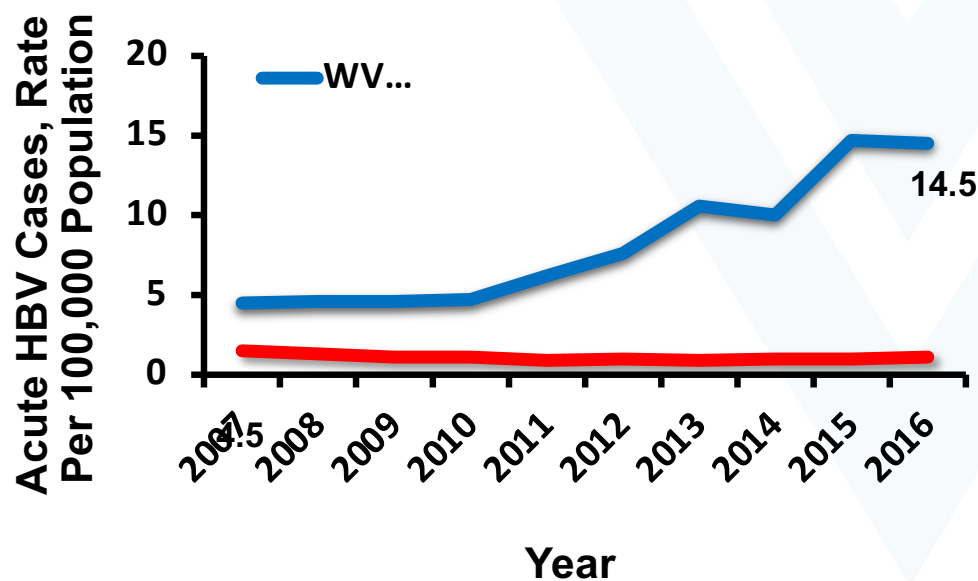
Increases in Acute Hepatitis B: Kentucky, Tennessee, and West Virginia, 2006–2013

- overall 114% increase
 - occurring after 2009 in whites, age 30-39, reporting IDU (all, $p < 0.001$)
 - no difference in gender
- 42% in non-urban areas
- typically low HBV vaccination rates in young adults
- parallels the simultaneous increase in acute HCV in these states
- “The concurrent increase in reports of acute HBV and HCV infections, as well as an increase in IDU reported among this population is concerning.”

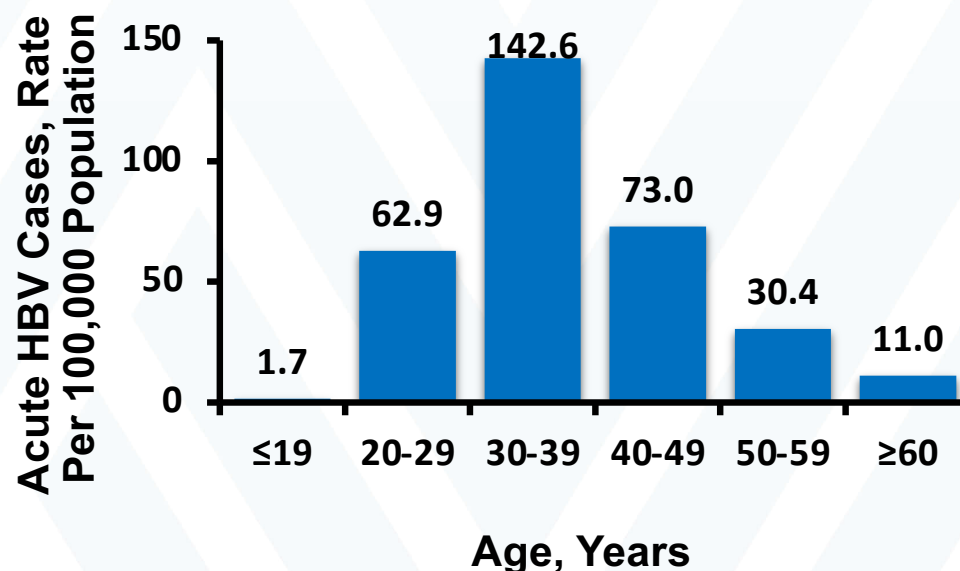
MMWR Jan. 29, 2016

Acute Hepatitis B in West Virginia, 2007-15

Incidence of Acute HBV Cases by
Year of Report, 2007–2016^a



Acute HBV Rates by Age Group,
West Virginia, 2012-2015



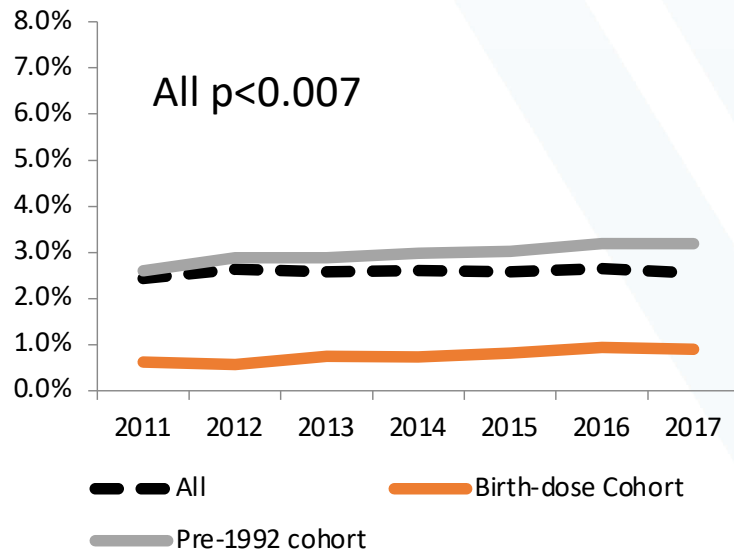
From 2012–2016, IDU and non-IDU were the most commonly reported risk factors among newly confirmed cases, with IDU = non-IDU in 2016

^a2016 data provisional.

WVDHHS. 2017. <https://dhhr.wv.gov/oeps/disease/ob/documents/viral-hep-profile-2017.pdf>. Accessed April 8, 2019.

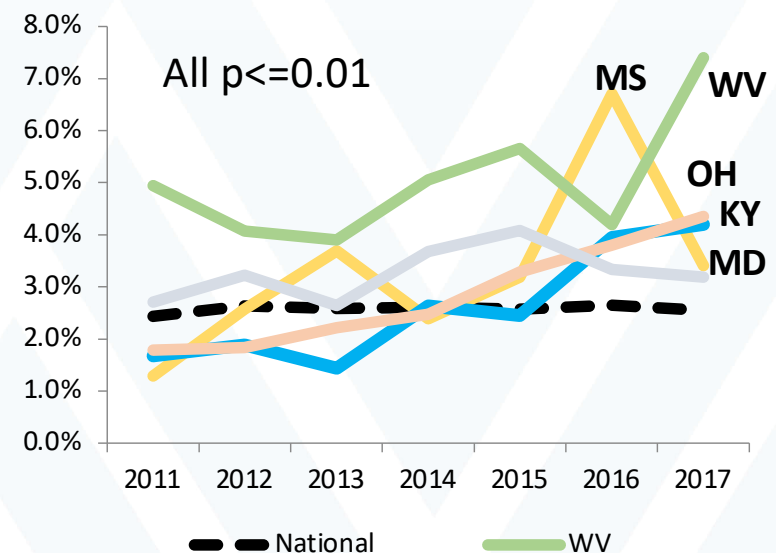
Prevalence of HBcAb (naturally acquired infection) Positivity in Women of Childbearing Age, 15-44

Birth-dose cohort versus pre-1992 cohort



- stable rates of HBV exposure over time
- lower overall rates in birth-dose cohort

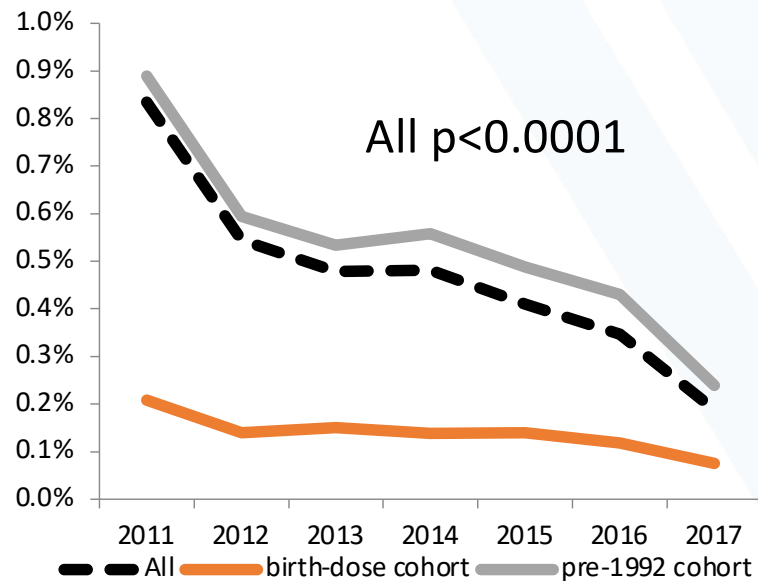
National trend vs states with opposing trends



- opposing trends in Mississippi, Kentucky, West Virginia, Ohio, and Maryland (Appalachian states)

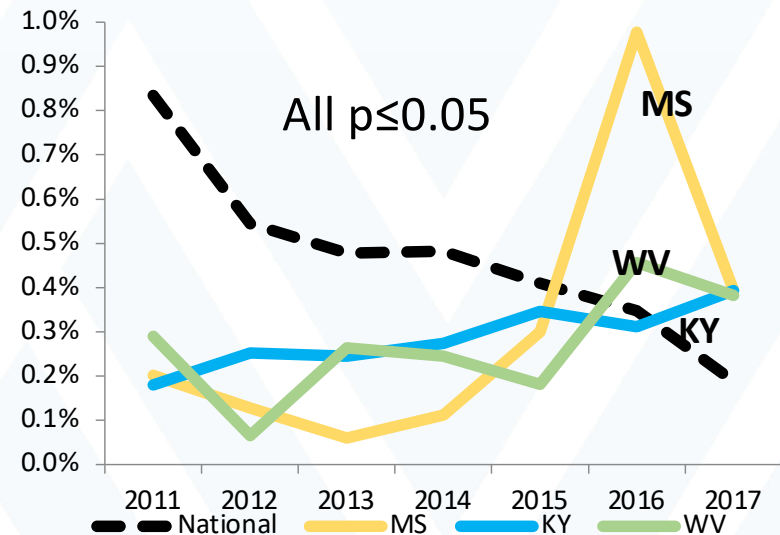
Prevalence of Chronic HBV (HBsAg+) in Women of Childbearing Age, 15-44

Birth-dose cohort versus pre-1992 cohort



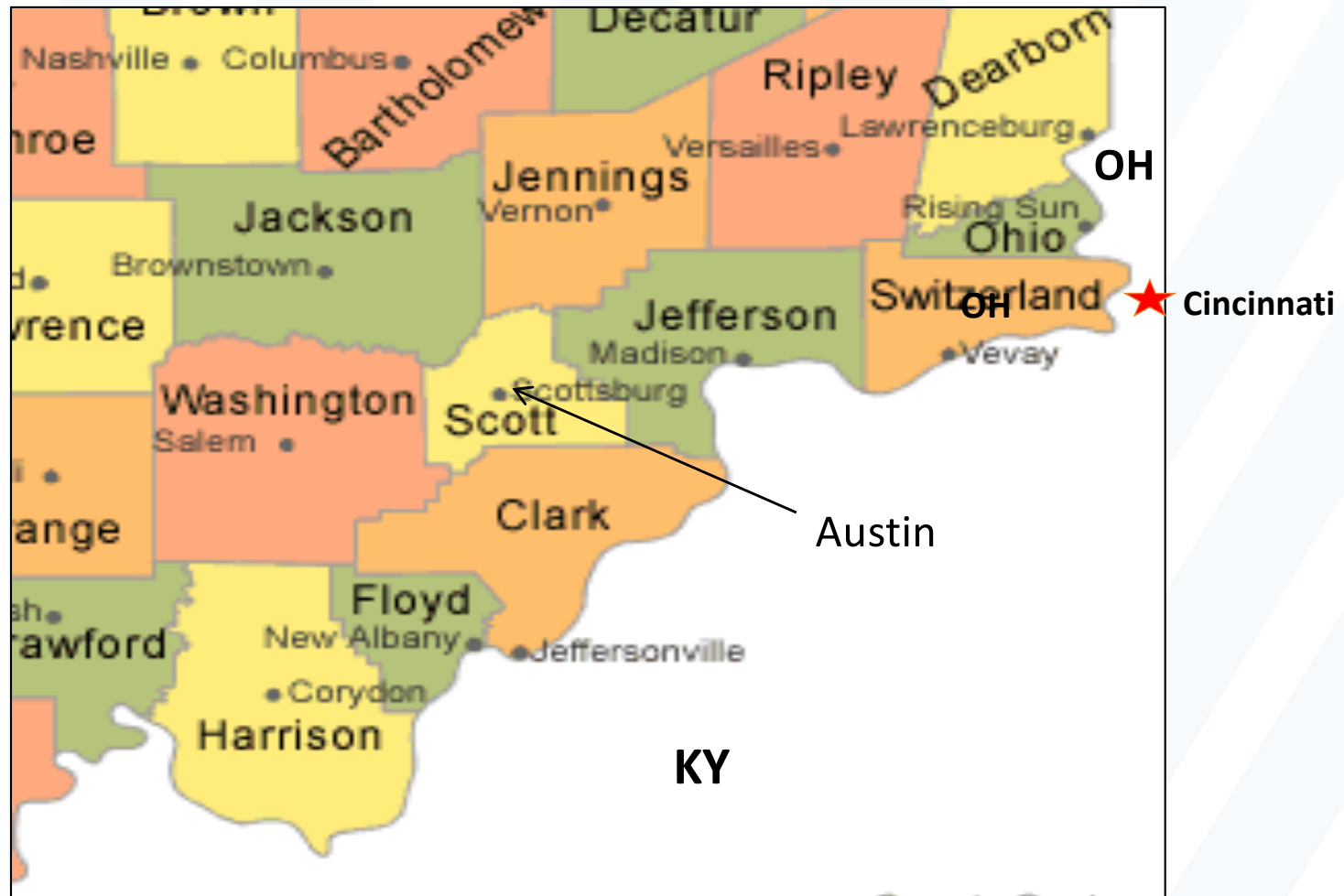
- overall decline in chronic HBV
- overall lower rate in birth-dose cohort

National trend vs states with opposing trends



- increase in MS, KY and WV (Appalachian states)
- no increase in any other states

Southeast Indiana: Scott County HIV Outbreak, 2014-16 (215 total cases)*



* ~93% are co-infected with hepatitis C

Demographic Characteristics of Scott County

- it had the worst health status of Indiana's 92 counties
- few physicians
- limited access to healthcare
- 9% unemployment
- 19% poverty rate
- 21% without a high school diploma

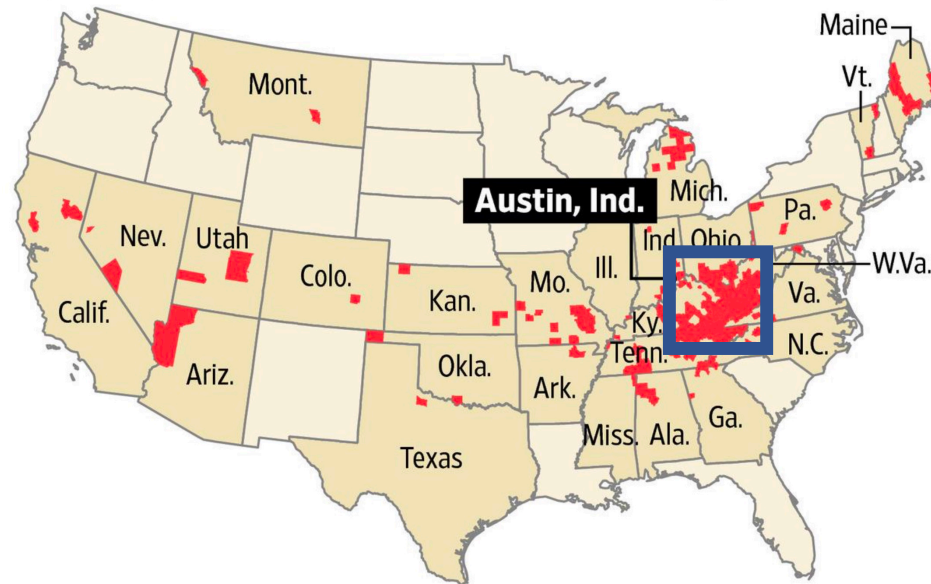
Brooks JT. The evolving epidemiology of HIV infection in persons who inject drugs: Indiana 2015. CROI; Boston, MA; February 22-25, 2016, abstract 132.

220 Rural Counties at Risk for Outbreaks of HIV and/or Hepatitis C Among People Who Inject Drugs

Where Disease Eruption Is a Threat

A CDC report identified 220 counties where factors such as unemployment rates, overdose deaths and sales of prescription painkillers contribute to a high vulnerability for outbreaks of HIV and hepatitis C among injection drug users.

■ Counties vulnerable to outbreaks of HIV and hepatitis C

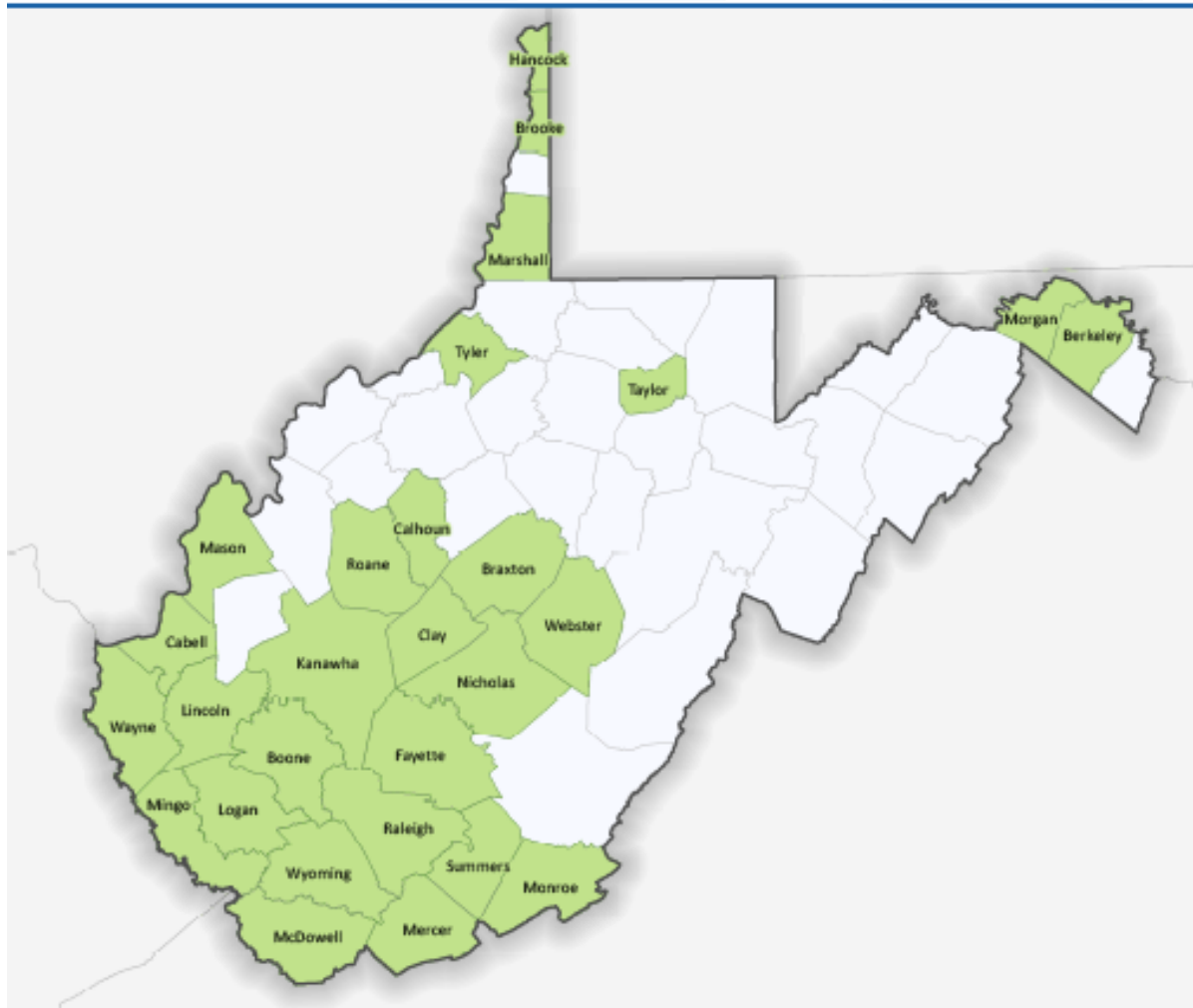


**>50% are
in central
Appalachia**

Source: Centers for Disease Control and Prevention

THE WALL STREET JOURNAL.

West Virginia Counties at Risk for HIV and/or Hepatitis C Outbreaks



- WV has highest proportion of at-risk counties (28/55 = 51%)-- 13% of US total)

HIV Infection Investigation in a Rural Area* — West Virginia, 2017

- 10 cases identified Jan-July 2017 in 3 low incidence counties; contact tracing found 47 more
- all linked epidemiologically or by HIV molecular analysis

57 total persons diagnosed

- 89% male, 75% white
- 15 southern coalfield counties
- 49% < 30 years old

Mode of transmission

- 60% male-to-male sex
- 9% injection drug use (IDU)
- 5% male-to-male sex + IDU
- 4% heterosexual
- **23% unknown**

Challenges to HIV Testing

- stigma
- limited healthcare access
- transportation
- poor health literacy
- provider lack of awareness

***across 15 southern coalfield counties,
14 of which are among the 220 at-risk
counties in US**

HIV Clusters in Huntington and Charleston

- from 2013-2017:
 - typical annual rate in WV = 77 and typical annual rate in Cabell Co. (Huntington) = 7 cases
 - new HIV cases started appearing in Huntington in fall 2018
- **number and proportion new HIV cases in WV attributed to IDU rising steadily**

year	total	assoc with IDU
2018	87	39 (45%)
2019	146	91 (62%)
Jan-June 2020	50	34 (68%)

HIV Clusters in Huntington and Charleston

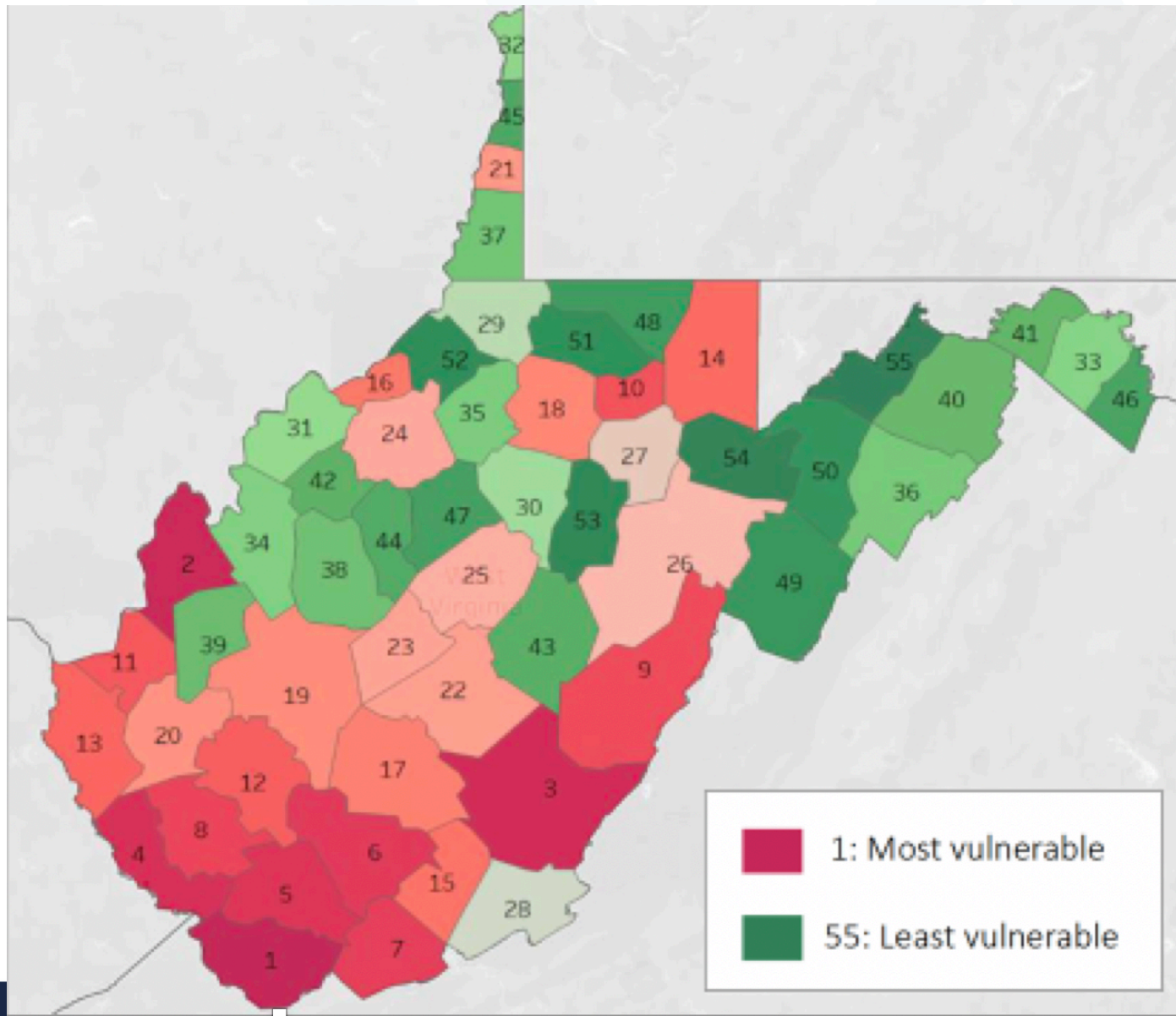
- 6 new cases in PWID unrelated to Huntington cluster reported in Charleston (WV Health Advisory #162, 10/9/19)

2018-June 2020	total	assoc with IDU
Cabell (Huntington)	103	92 (89%)
Kanawha (Charleston)	57	26 (46%)

- starting to see scattered cases around the state

RWCA clinics	2019 referrals	total (%) IDU
WVU (north)	54	13 (24%)
CAMC (central)	42	16 (38%)

WV Vulnerability Assessment for HCV and HIV



#2 Cabell
#19 Kanawha

Summary

- WV, largely rural and the 10th least populous state in the US, has been devastated by the opioid epidemic
- although this talk has focused on the chronic viral sequelae of injection drug use, the opioid epidemic has given rise to multiple syndemics, all of which must be addressed in a comprehensive, evidence-based, harm reduction public health approach