Hepatitis C Epidemiologic Profile for Allegheny County, PA, 2018

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Allegheny County Health Department
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Introduction

Hepatitis C is a liver disease that results from infection with the hepatitis C virus (HCV), which is spread primarily through contact with the blood of an infected person. Hepatitis C infection can be classified as either acute or chronic. Cases are referred to as acute if the infection is newly acquired. Acute infection generally leads to chronic infection, as only 15-25% of persons clear the infection without treatment. The Centers for Disease Control and Prevention (CDC) states that today most people become infected with HCV by sharing needles or other equipment to inject drugs.[1]

Surveillance Data

Acute Hepatitis C

Persons with acute hepatitis C infection often do not have symptoms; however, 20-30% of individuals have mild to severe gastrointestinal symptoms, including jaundice, within six months of infection. Identification of acute cases requires symptom information and laboratory data or evidence of seroconversion.

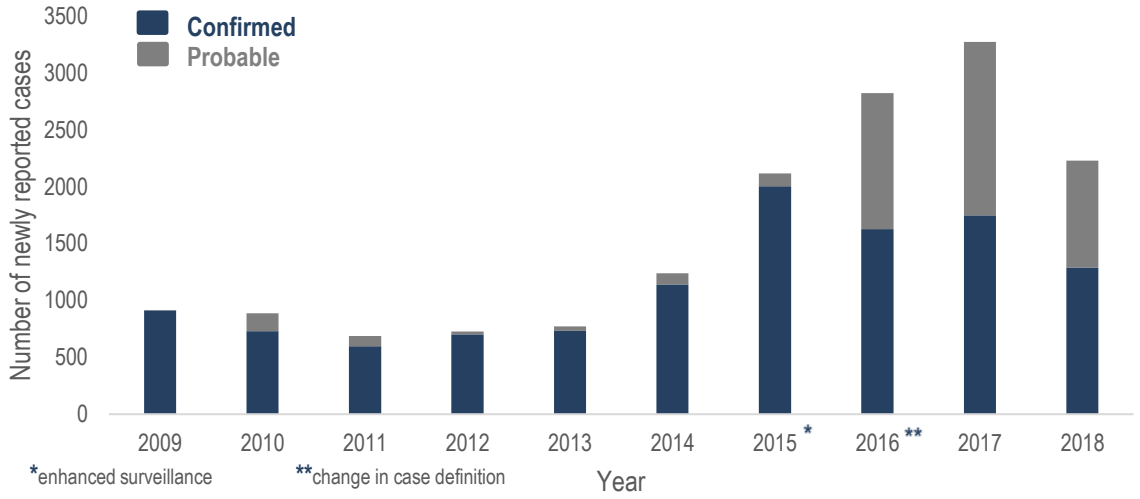
In 2018, the Allegheny County Health Department (ACHD) received reports of 7 cases of acute hepatitis C. The median age of cases was 29 years (range 22-46 years of age); 57% were male. Most cases of acute hepatitis C, however, are not diagnosed and not reported.

Chronic Hepatitis C

In 2018, there were 2,230 cases of hepatitis C among Allegheny County residents; 1,289 (58%) were classified as confirmed chronic cases (positive HCV NAT, HCV antigen, or genotype results without clinical information consistent with acute infection) and 941 (42%) were classified as probable chronic cases (HCV antibody but no confirmatory test and no clinical information consistent with acute infection).

The number of confirmed cases increased substantially in Allegheny County in 2015, most likely due to active investigation by ACHD of all positive lab tests, which was ACHD's practice for one year only. Probable cases increased in 2016 due to a change in the case definition which made it easier to classify cases as probable and include them in ACHD's case count.

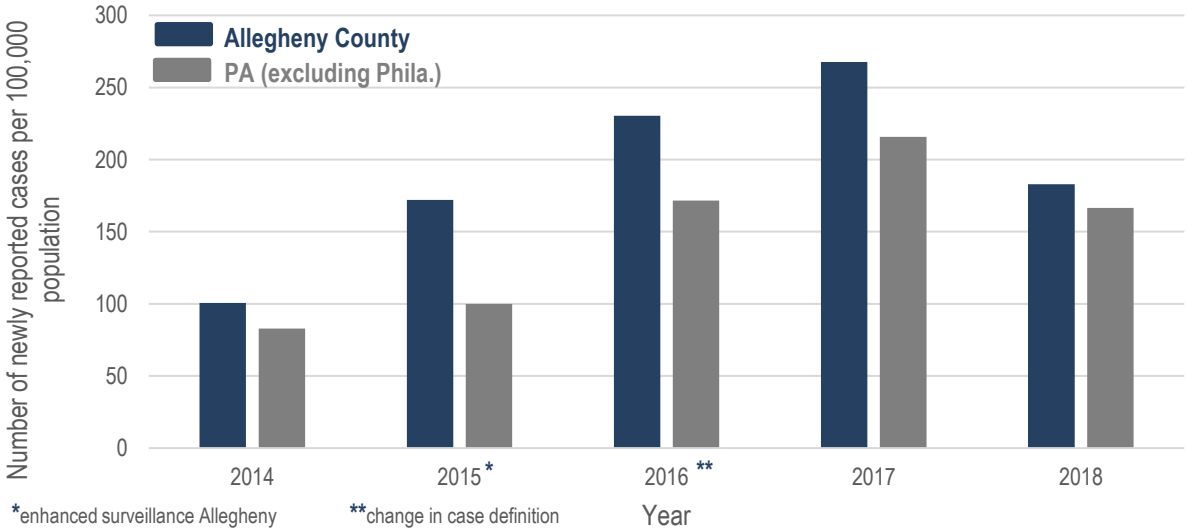
Figure 1: Number of newly reported hepatitis C cases by year Allegheny County, PA, 2009–2018



Data Source: Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS)

The rate of newly reported hepatitis C infections (confirmed and probable) is conisistently higher in Allegheny County compared with the rest of Pennsylvania (excluding Philadelphia). In 2016, there was an increase in case reports in Allegheny County and across the state. This may have been due to the expanded probable case definition and/or the implementation of Act 87, Hepatitis C Screening Act, which requires healthcare providers to offer hepatitis C screening to all individiauls born between 1945 and 1965; both began in 2016.

Figure 2: Rate of newly reported confirmed and probable hepatitis C cases per 100,000 in Allegheny County and Pennsylvania, 2014-2018

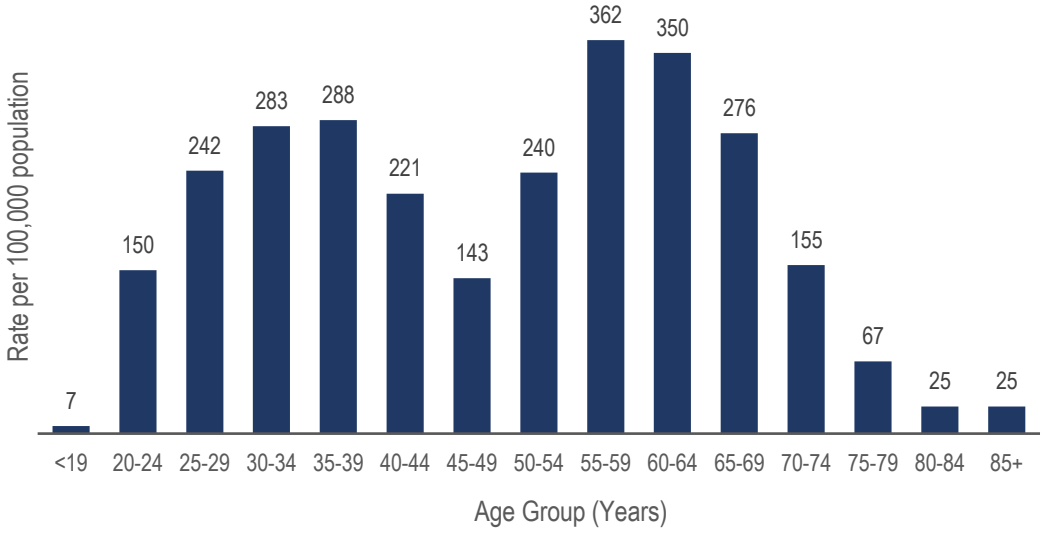


Data Source: Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS)

Chracteristics of People Newly Reported with Chronic Hepatitis C

The age distribution of chronic hepatitis C cases is bimodal with peaks in cases among those aged 55 to 64 years and in younger people aged 30 to 39 years (Figure 3).

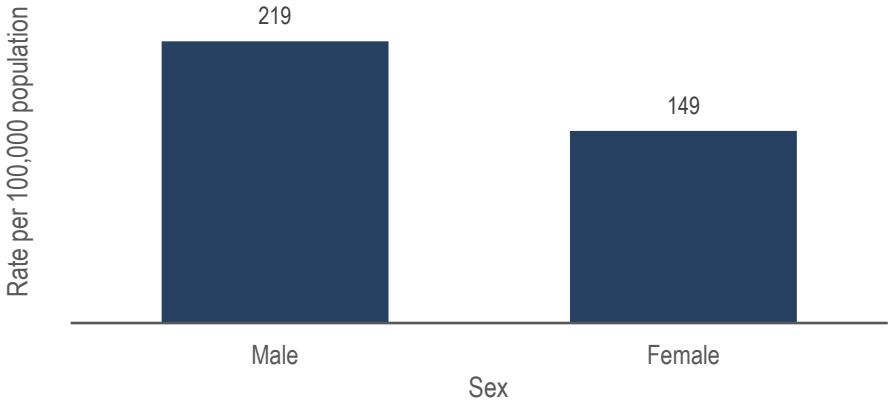
Figure 3: Rate of newly reported cases of chronic hepatitis C (confirmed and probable) per 100,000 in Allegheny County, by age, 2018



Data Source: Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS)

More cases were reported in males than females (219 vs. 149 per 100,000, Figure 4).

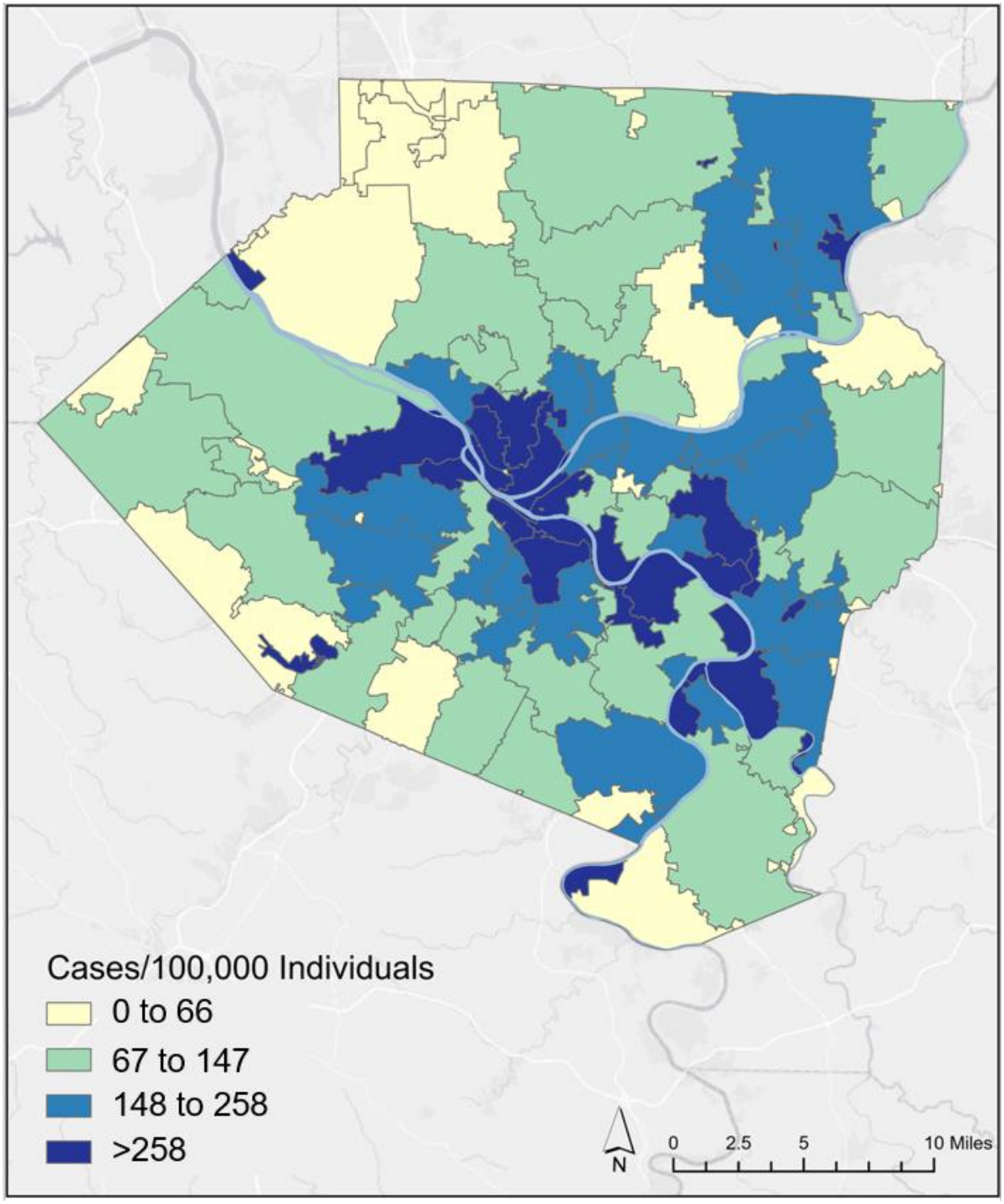
Figure 4: Rate of newly reported cases of chronic hepatitis C (confirmed and probable) per 100,000 in Allegheny County, by sex, 2018



Data Source: Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS)

This map shows rates of newly reported chronic hepatitis C cases in 2018 by zip code of residence. The most affected communities have rates greater than 258 cases per 100,000 residents.

Figure 5: Reported chronic hepatitis C rates in Allegheny County by zip code of residence, 2018



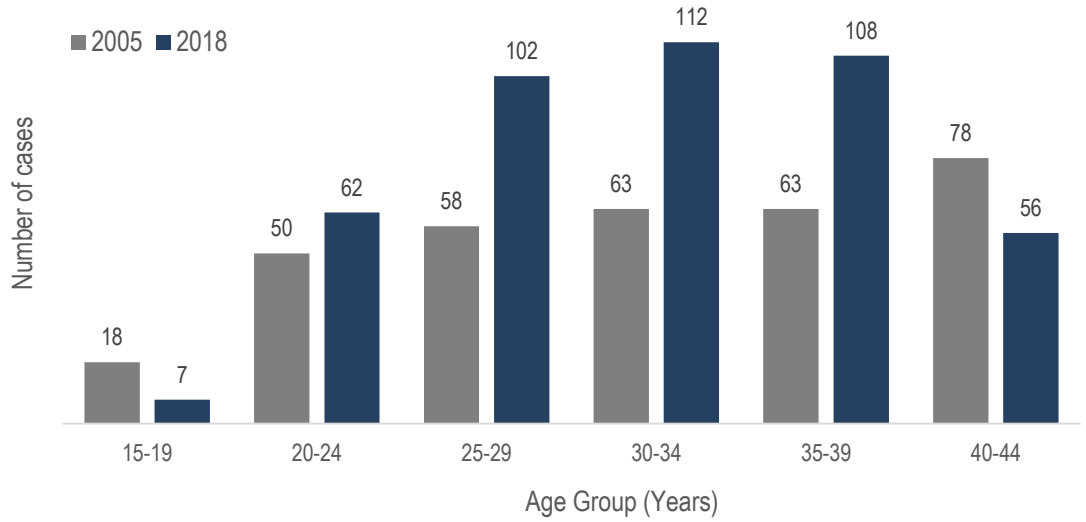
HIV/HCV Co-infection Rate

Of 2,230 reported cases of chronic hepatitis C in 2018, 0.7% were known to be HIV-infected according to a registry match of 2018 reported hepatitis C cases and all HIV case reports. The percentage of hepatitis C cases co-infected with HIV has decreased since 2016 (2.1%) and 2017 (1.7%).

Chronic Hepatitis C in Women of Reproductive Age (15-44 years)

Hepatitis C infection among women of reproductive age is of concern due to the risk for vertical (mother to baby) transmission of hepatitis C. The number of cases of hepatitis C among women of reproductive age increased between 2005 and 2018 (Figure 6). Some of this increase is likely due to the change in case definition in 2016, but some is also likely associated with the opioid epidemic, which led to an increase in injection drug use among women of reproductive age.

Figure 6: Number of women of reproductive age (15-44 years) reported with chronic hepatitis C in Allegheny County in 2005 compared to 2018



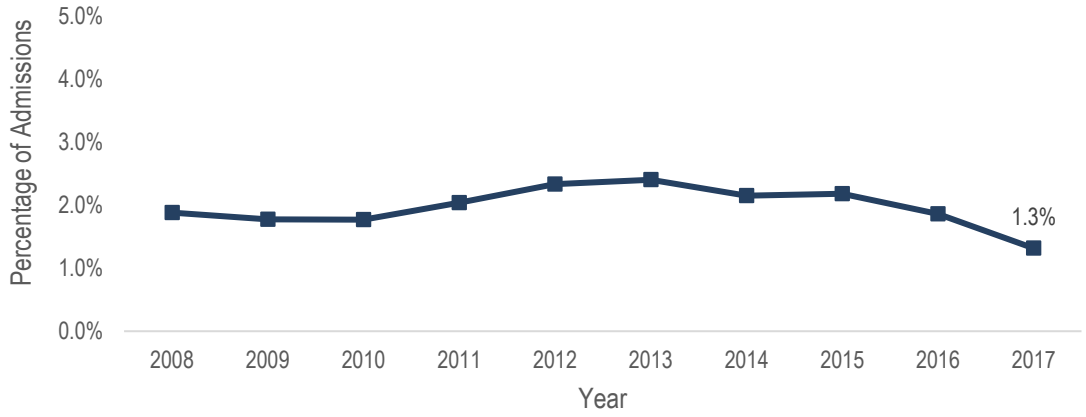
Data Source: Pennsylvania National Electronic Disease Surveillance System (PA-NEDSS)

Hospitalizations with HCV Infection

2,138	Number of hospital admissions among residents of Allegheny County with an HCV diagnosis in 2017	1.3%	Percentage of all hospital admissions among residents of Allegheny County with an HCV diagnosis in 2017

The percentage of all hospital admissions in Allegheny County with an HCV diagnosis (including primary diagnosis and up to 8 secondary diagnoses) has been decreasing since 2015 and was 1.3% in 2017. In 2017, there were 2,138 hospital admissions with an HCV diagnosis (174 per 100,000 population) in Allegheny County.

Figure 7: Percentage of all hospital admissions with an HCV diagnosis* in Allegheny County residents, by year

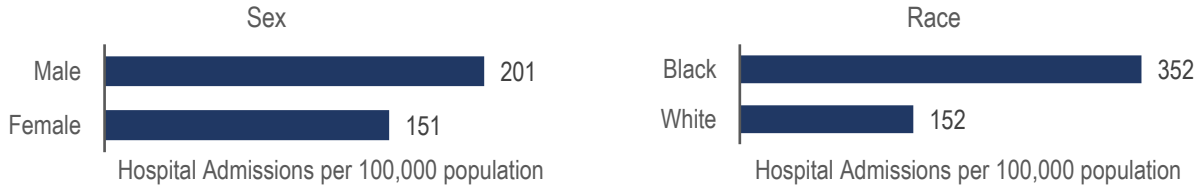


*Includes primary diagnosis and up to 8 secondary diagnoses

Date Source: Pennsylvania Health Care Cost Continament Council

The rate of hospitalization with an HCV diagnosis for blacks (352 per 100,000) was more than twice the rate for whites (152 per 100,000). In 2017, the rate of hospital admissions with an HCV diagnosis was higher in men (201 per 100,000) than in women (151 per 100,000).

Figure 8: Admissions with a hepatitis C diagnosis* per 100,000 population in Allegheny County by sex and race, 2017



*Includes primary diagnosis and up to 8 secondary diagnoses

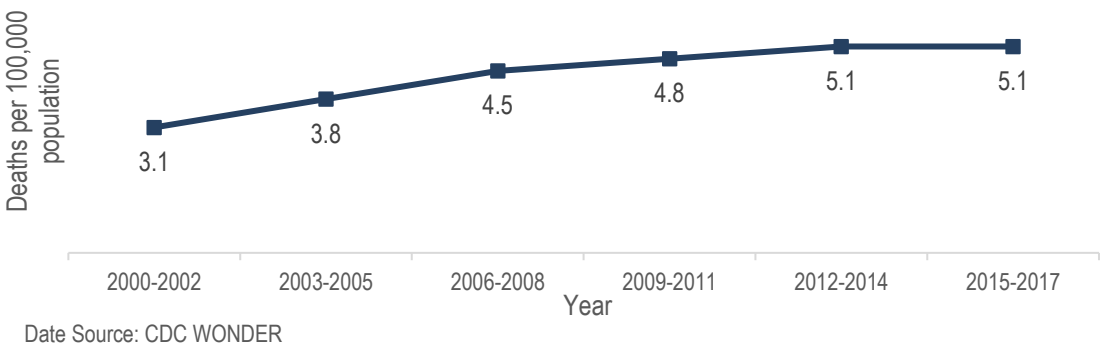
Data Source: Pennsylvania Health Care Cost Containment Council

Hepatitis C Related Mortality

56	Total number of deaths in 2017 with hepatitis C listed as a cause	5.1	Average annual hepatitis C associated mortality rate per 100,000 in 2015-2017

HCV-related mortality, defined as deaths with hepatitis C listed as an underlying or contributing cause of death on the death certificate, increased from an average annual rate of 3.1 per 100,000 in 2000-2002 to 5.1 per 100,000 in 2015-2017 in Allegheny County.

Figure 9: Average annual HCV-related mortality rate in Allegheny County, 2000-2017



HCV-related mortality is consistently higher in males compared to females and consistently higher in blacks compared to whites (Figure 10, 11). In 2015-2017, HCV related mortality was over twice as high in males compared to females. In 2015-2017, HCV-related mortality was over three times higher in blacks compared to whites.

Figure 10: Average annual HCV-related mortality rate in Allegheny County, by sex, 2000-2017

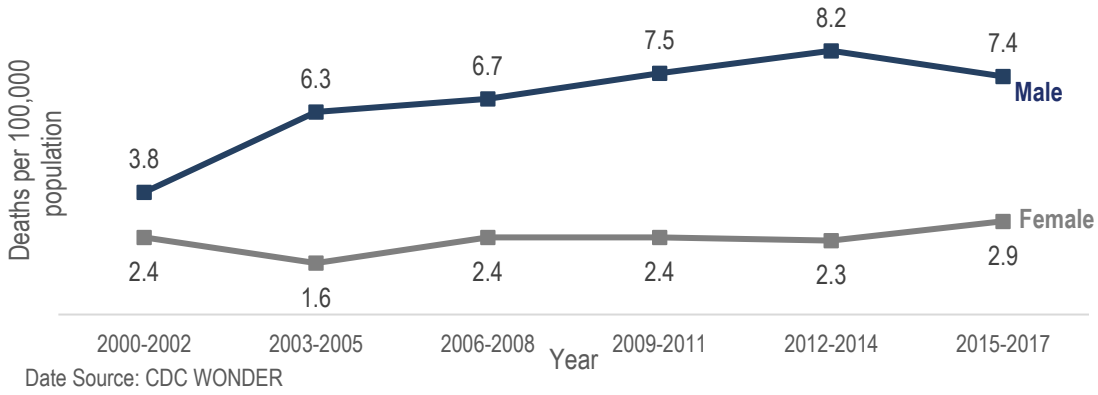
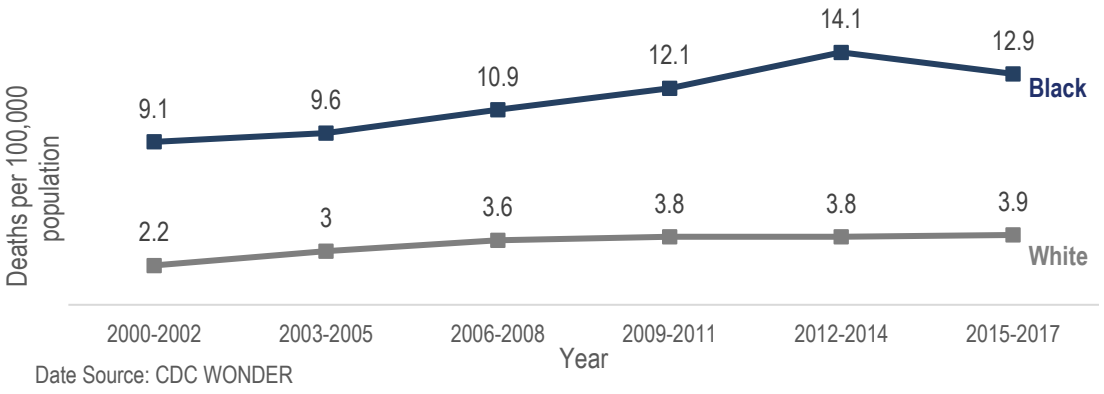
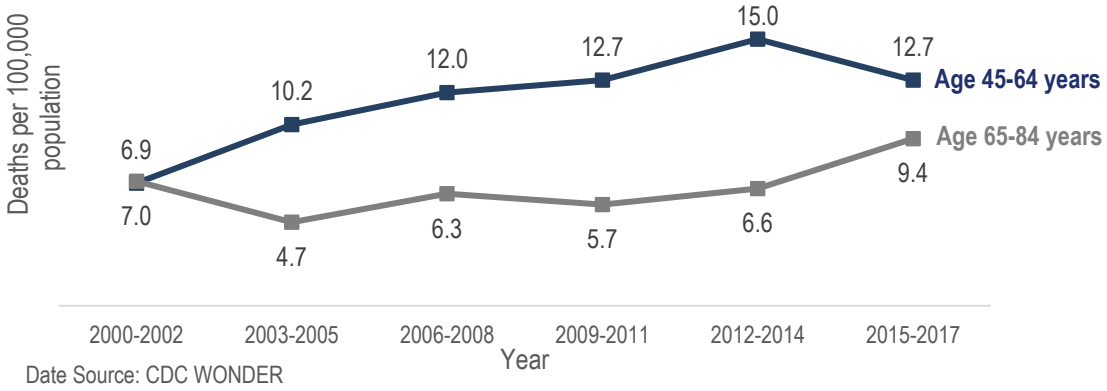


Figure 11: Average annual HCV-related mortality rate in Allegheny County, by race, 2000-2017



HCV-related mortality is higher in those aged 45-64 years compared to those aged 65-84 years. However, HCV-related mortality decreased among those aged 45-64 years from 2012-2014 to 2015-2017 while HCV-related mortality increased among those aged 65-84 years.

Figure 12: Average annual HCV-related mortality rate in Allegheny County, by age group, 2000-2017



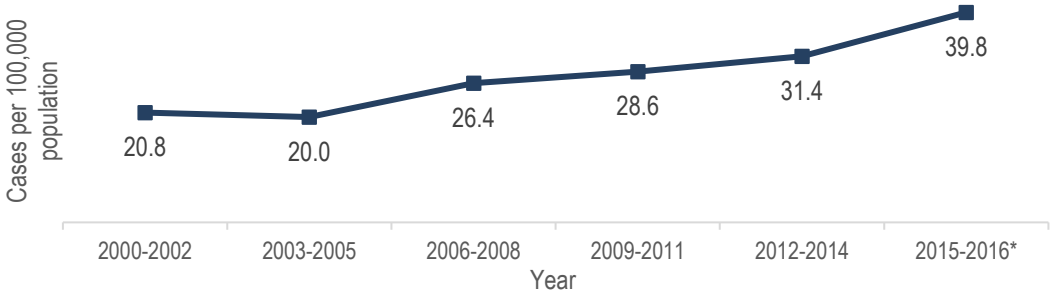
Date Source: CDC WONDER

Liver Cancer

977	Number of cases of liver cancer (all stages) in 2015-2016	50%	Percent increase in liver cancer incidence rate from 2003-2005

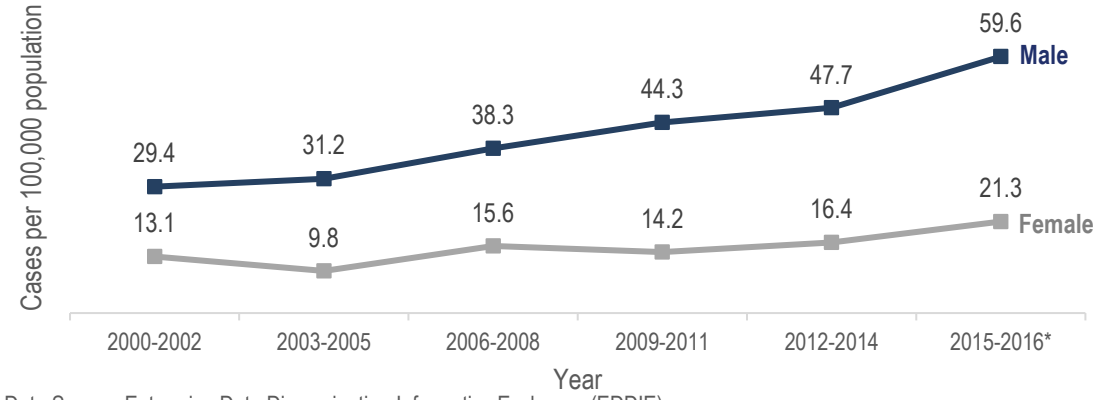
Chronic hepatitis C infection is a major risk factor for liver cancer. Liver cancer can develop after two or more decades of hepatitis C infection.[1] Incidence rates of liver and intrahepatic bile duct cancer in Allegheny County have been steadily increasing since 2003-2005 (Figure 13). Rates are greater in males than in females, greater in blacks than in whites, and greater older persons (50+) than in younger persons (<50 years). (Figures 14-16)

Figure 13: Average Annual Liver and Intrahepatic Bile Duct Cancer Incidence Rate in Allegheny County, 2000-2016



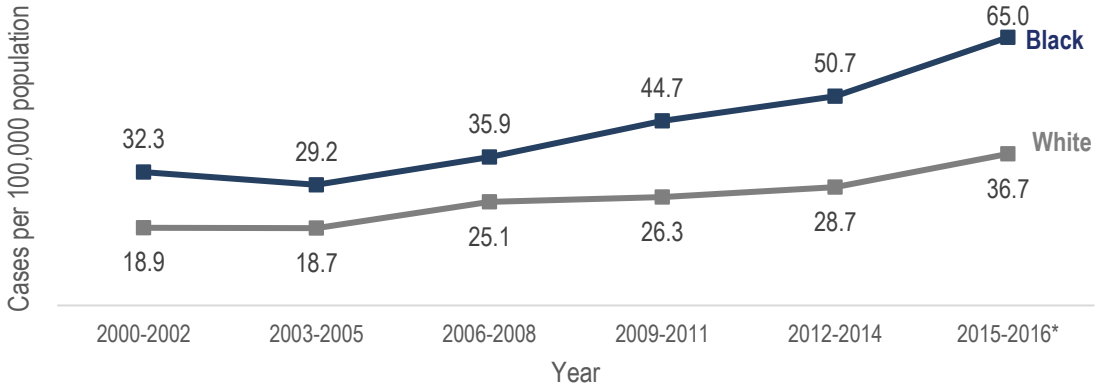
Date Source: Enterprise Data Dissemination Informatics Exchange (EDDIE), PADOH

Figure 14: Average Annual Liver and Intrahepatic Bile Duct Cancer Incidence Rate in Allegheny County, by sex, 2000-2016



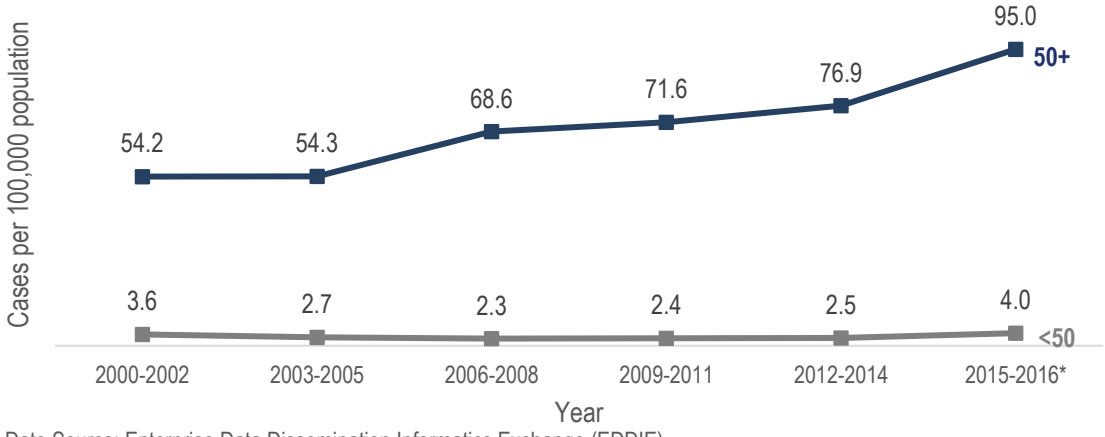
Date Source: Enterprise Data Dissemination Informatics Exchange (EDDIE)

Figure 15: Average Annual Liver and Intrahepatic Bile Duct Cancer Incidence Rate in Allegheny County, by race, 2000-2016



Date Source: Enterprise Data Dissemination Informatics Exchange (EDDIE)

Figure 16: Average Annual Liver and Intrahepatic Bile Duct Cancer Incidence Rate in Allegheny County, by age, 2000-2016



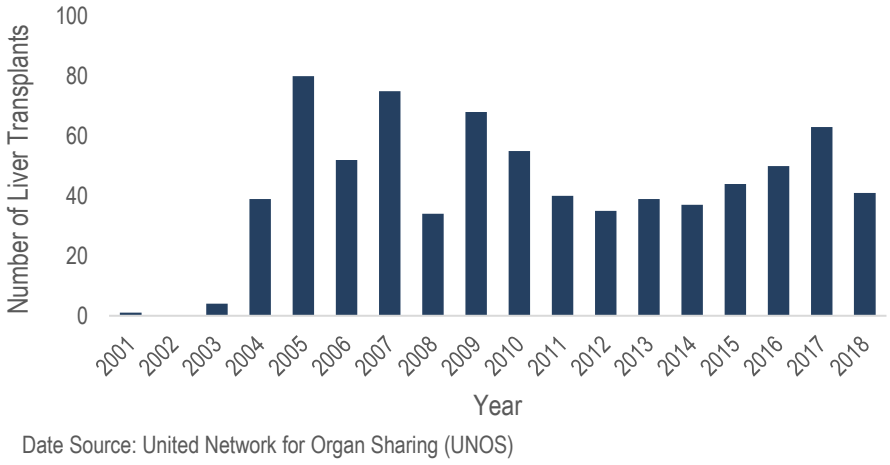
Date Source: Enterprise Data Dissemination Informatics Exchange (EDDIE)

Liver Transplants

41	Number of Liver Transplants in 2018	35%	Percentage of individuals who received a liver transplant who were HCV-positive from 2001-2018

Chronic hepatitis C is the leading indication for a liver transplant in the US. Data from UNOS indicate that from 2001-2018, 757 Allegheny County residents received a liver transplant. Hepatitis C serology results were reported for 484 individuals who received a liver transplant and 168 (34.7%) were HCV-positive.

Figure 17: Number of Liver Transplants for Allegheny County Residents, 2001-2018



Date Source: United Network for Organ Sharing (UNOS)

Prevalence Estimates

Using the methodology published by Hofmeister et al,[2] we estimated the prevalence of hepatitis C among Allegheny County residents ≥18 years. We used published NHANES estimates for prevalence in the noninstitutionalized civilian population and applied Hofmeister (2019) literature-based estimates for prevalence in two subpopulations excluded from NHANES: incarcerated individuals and people experiencing homelessness. Two other populations excluded from NHANES, nursing home residents and active military personnel, were assumed to have the same prevalence as the noninstitutionalized population.

For population estimates, US Census data were used for the Allegheny County population ≥18 years, and local survey data were used for persons experiencing homelessness and incarcerated individuals. Applying the prevalence estimates to the various subpopulations yielded an estimate of 15,880 HCV antibody positive and 9,600 HCV RNA-positive adult residents of the county in 2016.

Table 1: Estimated prevalence of HCV among Allegheny County residents ≥18 years, 2016

Population	Population size	% HCV Ab+	# HCV Ab+	% HCV RNA+	# HCV RNA+
Total NHANES sampling frame: noninstitutionalized adults plus nursing home residents and active military	985,905	1.5%*	14,789	0.9%*	8,873
Incarcerated	5,685	16.1%*	915	10.7%*	608
Homeless	1,145	14.7%*	168	10.8%*	124
Total	**992,735**	**1.6%**	**15,872**	**0.97%**	**9,605**

*Estimates taken from Hofmeister MG, Rosenthal EM, Barker LK et al. Estimating prevalence of hepatitis C virus infection in the United States, 2013-2016. Hepatology 2019;69:1020-1031

Hepatitis C Testing

2018 Facility Survey

ACHD conducts annual sentinel surveillance of hepatitis C screening at facilities serving high risk populations in the county. In 2018, 151 facilities were contacted and 109 (72%) responded to the survey. In 2018, 86% of respondents provided hepatitis C testing but not all provide it themselves. For example, 75% of drug and alcohol treatment facilities provided hepatitis C testing but just 9% are providing testing themselves; the others rely on periodic testing by outside agencies. (Tables 2-3)

Table 2: Response rate and facilities providing hepatitis C testing in Allegheny County, by facility type, 2018

Facility	# Facilities Contacted	# Submitted Data	Response Rate	# Providing Testing	% Respondents Providing Testing
Blood & Plasma	3	1	33%	1	100%
Drug & Alcohol Treatment	68	44	65%	33	75%
Dialysis Center	33	31	94%	31	100%
FQHC	17	13	76%	12	92%
HIV Clinics	16	11	69%	10	91%
Homeless	8	5	63%	3	60%
Other	6	4	67%	4	100%
Total	*151*	*109*	*72%*	*94*	*86%*

Table 3: Facilities providing hepatitis C screening themselves, in Allegheny County, by facility type, 2018

Facility	# Submitting Data	# Respondents doing own testing	% Respondents doing own testing
Blood & Plasma	1	1	100%
Drug & Alcohol Treatment	44	4	9%
Dialysis Center	31	31	100%
FQHC	13	12	100%
HIV Clinics	11	7	64%
Homeless	5	1	20%
Other	4	4	100%

In 2018, facilities serving people experiencing homelessness had the highest positivity however, this is based on just 12 reported tests which may not accurately represent the antibody positivity in this population. Drug and alcohol treatment centers had the second highest positivity, reporting that 30.4% of clients tested were antibody positive.

Table 4: Number of clients tested and number of clients antibody positive by facility type in Allegheny County, 2018

Facility	# clients antibody tested	# clients antibody positive	% clients antibody positive
Blood & Plasma	75,079	65	0.1%
Drug & Alcohol Treatment	691	210	30.4%
Dialysis Center	2126	141	6.6%
FQHC	1594	161	10.1%
HIV Clinics	1764	115	6.5%
Homeless	12	5	41.7%
Other	180	7	3.9%

ACHD Response

Hepatitis C kills more Americans than any other infectious disease reported to the Centers for Disease Control and Prevention.[3] Hepatitis C surveillance is essential for quantifying the burden of disease in our community. ACHD works to improve data collection and accuracy.

ACHD is a key leader in the Hep C Free Allegheny (HCFA) initiative. Launched in March 2018, HCFA unites public health, private healthcare organizations, community-based organizations, drug and alcohol treatment facilities, and other partners to identify methods to increase testing for HCV and provide improved access to care and treatment within Allegheny County. Hep C Free Allegheny envisions a county where new hepatitis C infections are rare and quickly identified, and people with hepatitis C

are rapidly linked to care and treated, reducing hepatitis C related inequities. HCFA seeks to maximize the health and wellness of all Allegheny County residents living with and at risk for hepatitis C by expanding prevention, harm reduction, education, testing, and timely access to care and treatment. The HCFA surveillance workgroup will continue to monitor cases and sequalae of HCV infection in Allegheny County to inform the work of HCFA.

References

1. Centers for Disease Control and Prevention. "Hepatitis C Information." (2019). Retrieved from https://www.cdc.gov/hepatitis/hcv/index.htm
2. Hofmeister MG, Rosenthal EM, Barker LK et al. Estimating prevalence of hepatitis C virus infection in the United States, 2013-2016. Hepatology 2019;69:1020-1031
3. Centers for Disease Control and Prevention. "Hepatitis C Kills More Americans than Any Other Infectious Disease" (2016). Retrieved from https://www.cdc.gov/nchhstp/newsroom/2016/hcv-press-release.html