

Wisconsin Hepatitis C Virus Surveillance

Annual Review, 2016

Newly Reported Cases, Prevalent Cases, and Trends

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Hepatitis C Virus

Hepatitis C is a liver disease caused by the hepatitis C virus (HCV). HCV is spread primarily by exposure to blood from an infected person. Acute HCV infection is a short-term illness that occurs within the first six months after exposure to the virus. For most people, acute infection leads to chronic infection. Chronic HCV infection is a long-term illness that occurs when HCV remains in a person's body. HCV infection can last a lifetime and lead to serious liver problems, including cirrhosis (scarring of the liver) or liver cancer. It is the most common bloodborne infection in the U.S. with approximately 3.5 million persons with current infection.¹ The majority of infected persons are not aware of their infection because they are not clinically ill, but they are a source of transmission to others and at risk for chronic liver disease. Today, most people become infected with HCV by sharing needles or other equipment used to inject drugs. Although less common, HCV can also be spread sexually, from an infected mother to her infant, or by invasive health care procedures.

Surveillance Summary for 2016

New Reports and Disease Status: During 2016, 3,927 past, present, or acute HCV diagnoses were reported in Wisconsin at a rate of 68.1 cases per 100,000 people. From 2012 to 2016, the rate of all HCV reports increased by 49%.

Acute Hepatitis C: During 2016, 106 reports of acute HCV were reported at a rate of 1.8 cases per 100,000. Reports of acute HCV infection increased more than 300% from 2012 to 2016 in Wisconsin. Surveillance data indicate the majority of these acute infections resulted from injection drug use.

Prevalence: Recent estimates of HCV infection in the U.S. suggest 3.5 million people are living with HCV. Based on national estimates of age, sex, and race-specific sero-prevalence, approximately 90,000 Wisconsin residents have evidence of HCV infection, of which 42,500 have been identified.

Geography: In 2016, new HCV cases were reported from all 72 counties. Milwaukee County accounted for 20%, Dane County for 9% and Racine and Brown County each for 4% of HCV reports in 2016. Of 72 counties, 34 (47%) reported more cases in 2016 than in the previous year.

Age: In 2016, there were 960 HCV infections reported among people aged 15-29 in Wisconsin. The rate of HCV in this age group increased 55% in the past five years, from 54.2 cases per 100,000 in 2012 to 84.0 cases per 100,000 in 2016. Infections in this age group are attributed to a rise in injection drug use. In 2016, there were 1,683 HCV infections reported among people born from 1945-1965. This group represents the baby boomer generation who, in the U.S., are five times more likely than other adults to be chronically infected.

Sex: During 2016 there were 1,612 females and 2,314 males reported with HCV infection in Wisconsin. From 2012 to 2016, rates increased by 55% among females and 45% among males.

Race and Ethnicity: In 2016, there was a significant increase in both the number and rate of new HCV reports from American Indians/Alaska Natives as well as from non-Hispanic Whites. The reported rate of HCV among American Indians and non-Hispanic Blacks has been substantially higher than the rate in non-Hispanic Whites for the past five years.

Risk: The primary risk factor for acute HCV infection was injection drug use, reported by 66 (62%) of 106 persons with acute HCV. Among those who reported injection drug use, 67% reported sharing "works" or injection equipment.

Table 1. Hepatitis C virus reports in Wisconsin, 2016

Case definition	Number	Rate per 100,000
Hepatitis C, Chronic†	3,821	66.3
Hepatitis C, Acute‡	106	1.8
Total	3,927	68.1

†Includes 2,311 confirmed and 1,510 probable.

‡Includes 103 confirmed and 3 probable.

Case Definitions and Classification for 2016:

Hepatitis C, Chronic, Confirmed, and Probable can be found at: [National Notifiable Diseases Surveillance System, Hepatitis C, Chronic](#)

Hepatitis C, Acute, Confirmed, and Probable can be found at: [National Notifiable Diseases Surveillance System, Hepatitis C, Acute](#)

Table 2. History of hepatitis C virus reports† in Wisconsin, 2007-2016

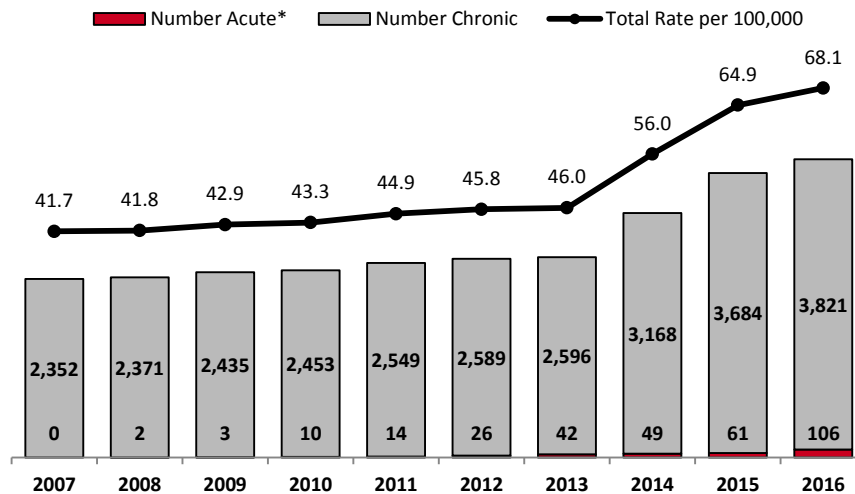
Year	Past/Present and Chronic		Acute		Total	
	Number	Rate per 100,000‡	Number	Rate per 100,000‡	Number	Rate per 100,000‡
2007	2,352	41.7	0	--	2,352	41.7
2008	2,371	41.8	2	--	2,373	41.8
2009	2,435	42.9	3	--	2,438	42.9
2010	2,453	43.1	10	0.2	2,463	43.3
2011	2,549	44.7	14	0.2	2,563	44.9
2012	2,589	45.3	26	0.5	2,615	45.8
2013	2,596	45.3	42	0.7	2,638	46.0
2014	3,168	55.1	49	0.9	3,217	56.0
2015	3,684	63.9	61	1.1	3,745	64.9
2016‡	3,821	66.2	106	1.8	3,927	68.1

†Includes probable and confirmed cases.

‡Rates based on counts less than five have been suppressed. Rates based on counts less than 12 are statistically unreliable.

±2016 numbers reflect a change in the National Notifiable Diseases Surveillance System definition of Hepatitis C, Chronic and Hepatitis C, Acute. The change in definition accounts for 20 of the Hepatitis C, Acute cases reported in 2016.

Figure 1. Rise in number and rate of hepatitis C virus reports in Wisconsin, 2007-2016



*2016 numbers reflect a change in the National Notifiable Diseases Surveillance System definition of Hepatitis C, Chronic and Hepatitis C, Acute. The change in definition accounts for 20 of the Hepatitis C, Acute cases reported in 2016.

All Cases: Reports by County

Table 3. Newly reported hepatitis C virus by county of residence

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016	Percent of
							Rate per 100,000	Reports in 2016
Adams	14	6	11	22	28		▲ 136.1	1
Ashland	8	8	13	6	10		62.6	0
Barron	15	20	17	20	24		52.1	1
Bayfield	3	3	10	13	5		33.1	0
Brown	105	123	108	139	156		60.6	4
Buffalo	2	4	3	6	5		37.0	0
Burnett	9	5	11	22	18		▲ 116.8	0
Calumet	14	12	20	18	18		35.5	0
Chippewa	21	32	25	16	46		▲ 72.2	1
Clark	14	9	10	11	14		40.3	0
Columbia	25	20	28	42	44		▲ 77.3	1
Crawford	5	2	3	10	7		42.1	0
Dane	173	183	218	304	347		67.1	9
Dodge	25	23	20	42	49		54.8	1
Door	7	7	4	7	4		--	0
Douglas	28	42	50	40	23		52.1	1
Dunn	10	19	15	22	19		42.7	0
Eau Claire	26	52	58	65	80		▲ 78.7	2
Florence	6	9	1	3	10		▲ 223.6	0
Fond du Lac	33	43	39	65	68		66.2	2
Forest	17	9	7	7	11		▲ 119.5	0
Grant	8	6	13	10	19		36.0	0
Green	8	9	12	14	15		40.5	0
Green Lake	6	9	9	14	16		▲ 84.0	0
Iowa	4	2	6	10	15		63.0	0
Iron	2	2	4	6	2		--	0
Jackson	10	8	16	10	20		▲ 96.7	1
Jefferson	20	25	42	56	56		66.4	1
Juneau	18	15	19	18	22		▲ 82.3	1
Kenosha	93	83	122	121	91		54.2	2
Kewaunee	5	5	2	5	3		--	0
La Crosse	29	53	59	78	74		62.8	2
Lafayette	4	1	8	5	4		--	0
Langlade	9	13	26	24	22		▲ 111.6	1
Lincoln	5	14	16	15	19		66.6	0
Manitowoc	49	36	42	53	54		66.8	1
Marathon	61	60	53	48	78		57.5	2
Marinette	30	22	32	27	47		▲ 113.9	1
Marquette	11	4	9	6	18		▲ 117.6	0
Menominee	7	1	2	7	4		--	0
Milwaukee	652	591	797	901	773		▲ 81.2	20
Monroe	20	20	50	44	34		▲ 74.5	1

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016
Oconto	19	16	9	11	14		36.9	0
Oneida	19	21	12	22	8		22.2	0
Outagamie	47	69	66	107	128		70.2	3
Ozaukee	17	18	16	18	19		21.6	0
Pepin	1	1	5	3	3		--	0
Pierce	9	9	8	25	15		36.4	0
Polk	13	12	17	14	12		27.3	0
Portage	16	16	15	31	23		32.5	1
Price	5	7	8	15	15		107.5	0
Racine	107	100	114	124	143		73.2	4
Richland	4	2	15	10	8		44.9	0
Rock	86	88	105	99	89		55.5	2
Rusk	6	5	5	5	5		34.3	0
St. Croix	14	18	17	34	34		39.2	1
Sauk	23	27	27	28	77		122.8	2
Sawyer	12	12	15	16	14		84.2	0
Shawano	19	6	8	21	38		91.3	1
Sheboygan	36	43	41	57	58		50.3	1
Taylor	4	3	2	1	2		--	0
Trempealeau	6	6	13	14	13		44.2	0
Vernon	5	5	7	16	12		39.7	0
Vilas	16	16	8	15	28		129.9	1
Walworth	40	26	39	50	44		42.9	1
Washburn	8	7	10	9	6		38.0	0
Washington	32	25	29	37	31		23.2	1
Waukesha	70	91	97	126	110		27.8	3
Waupaca	18	15	49	59	57		109.0	1
Waushara	4	3	6	9	19		78.1	0
Winnebago	85	77	90	125	122		72.2	3
Wood	30	26	30	37	29		38.9	1
Unknown	1	1	2	2	5		--	0
Federal Corrections	0	0	8	0	2		--	0
State Corrections	232	257	314	253	372		--	9
Total	2615	2638	3217	3745	3927		68.1	100

†Rates based on counts less than five have been suppressed. Rates based on counts less than 12 are statistically unreliable. Rates are not available for Corrections populations. ▲Indicates the rate in 2016 is higher than the statewide rate.

In 2016, new HCV cases were reported in all 72 counties. Milwaukee County accounted for 20%, Dane County for 9%, and Racine and Brown County each for 4% of HCV reports in 2016. **Table 3** includes the number of HCV reports in residents of each county for the past five years and the population-based rate for the current year. Of the 72 counties, 34 (47%) reported more cases in 2016 than in the previous year. In terms of rate per county population, 25 counties reported a rate in 2016 that was higher than the statewide rate for the year (indicated with a triangle in Table 3).

Table 4. Newly reported hepatitis C virus by region of residence†

Region of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016
Northern	213	218	220	259	276		56.5	8
Northeastern	495	491	536	730	824		66.3	23
Southern	402	389	492	630	736		65.2	21
Southeastern	1031	959	1256	1433	1267		59.8	36
Western	241	322	389	438	445		56.6	13
Unknown	1	1	2	2	5		--	0
Total	2383	2380	2895	3492	3553			100

†Excludes cases reported from Wisconsin Department of Corrections and the Federal Correctional Institution.

In 2016, 36% of reports were from the Southeastern Region of the state. The Southeastern Region is the only region to see a significant decrease in trend from 2015 to 2016.

Changes in number and rates in a county or region may be due to an increase in new HCV infections, changes in provider HCV screening practices from year to year, or differences in the amount of resources each jurisdiction has dedicated to HCV surveillance.

All Cases: Prevalence

Recent estimates of HCV infection in the U.S. suggest 3.5 million people are living with HCV infection.¹ Infection is most common among those born between the years 1945 and 1965, the majority of whom were likely infected during the 1970s and 1980s when rates were highest. Since 2000, approximately 42,500 HCV infections have been reported to the Wisconsin Division of Public Health in individuals presumed to be alive as of 2015. The CDC estimates that 45%-85% of HCV-infected persons have not been tested or identified so the true number of those with HCV in Wisconsin is unknown. Based on national estimates of age, sex, and race-specific prevalence of HCV antibody, approximately 90,000 Wisconsin residents have evidence of HCV infection.

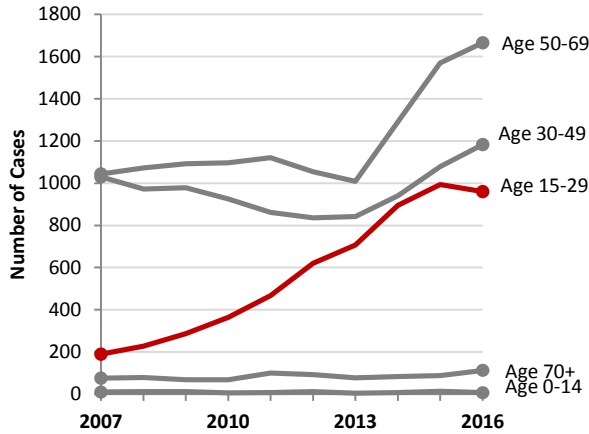
Table 5. Prevalent reported hepatitis C virus as of December 31, 2016, by region of residence

Public Health Region†	Number‡	Percent
Northern	2,455	6
Northeastern	6,095	16
Southern	6,266	17
Southeastern	17,374	46
Western	4,157	11
Unknown	1,620	4
Total	37,967	100

†Region represents region of residence at time of report. ‡Excludes 4,533 cases reported from the Wisconsin Department of Corrections and the Federal Correctional Institution.

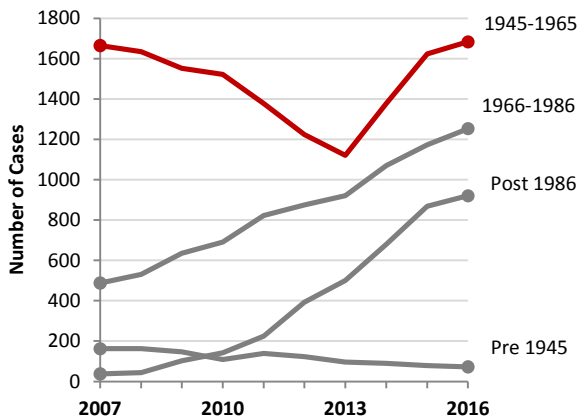
All Cases: Reports by Age

Figure 3. Trend of reported hepatitis C virus cases, by age at report, 2007-2016



In 2016, there were 960 HCV infections reported among people aged 15-29 in Wisconsin. The rate of HCV in this age group decreased 3% during 2015 to 2016, from 86.9 to 84.0 cases per 100,000 population. The number of infections in this age group has increased 400% since 2007 and the rise is attributed to increased heroin use in Wisconsin² (Figure 3).

Figure 4. Trend of reported hepatitis C virus cases, by birth cohort, 2007-2016



In 2016, there were 1,683 HCV infections reported among people born from 1945-1965. This group represents the baby boomer generation who, in the United States, are five times more likely than other adults to be chronically infected. This birth cohort has accounted for the largest number of reported infections for the past 10 years. The 50% increase in number of reports from this birth cohort since 2013 likely reflects the Centers for Disease Control and Prevention (CDC) recommendation in August of 2012 that adults born from 1945-1965 should receive one-time testing for HCV without prior ascertainment of HCV risk³ (Figure 4).

Table 6. Age at report of hepatitis C virus in Wisconsin, 2012-2016

Age Group (Years)	2012		2013		2014		2015		2016	
	N	Rate†	N	Rate†	N	Rate†	N	Rate†	N	Rate†
0-14	12	1.1	4	--	8	0.7	14	1.3	7	0.7
15-29	621	54.2	706	61.8	895	78.3	994	86.9	960	84.0
30-39	393	56.4	430	60.9	520	72.9	667	93.5	754	104.6
40-49	443	57.2	411	54.7	420	57.6	412	56.5	428	60.1
50-59	763	90.2	681	79.9	873	102.3	946	110.9	935	110.1
60-69	291	48.9	328	53.1	418	65.1	624	97.2	730	109.2
70+	92	16.2	78	13.4	83	14.0	88	14.8	113	18.7
Total	2615	45.8	2638	46.2	3217	56.1	3745	65.3	3927	68.1

†Rate is per 100,000 population in each age group. Rates based on counts less than five have been suppressed. Rates based on counts less than 12 are statistically unreliable.

All Cases: Reports by Sex

In the past 10 years, the data have shifted from a single peak of new reports from middle-age adults in 2007, to a distribution with two peaks in 2016. **Figure 5** shows the increased number of reports from adolescents and young adults in 2016 compared to 2007. In 2016, there were 298 new HCV reports among women of reproductive age (15-44 years).

Figure 5. Shift in the sex and age distribution of new reports of hepatitis C virus in Wisconsin

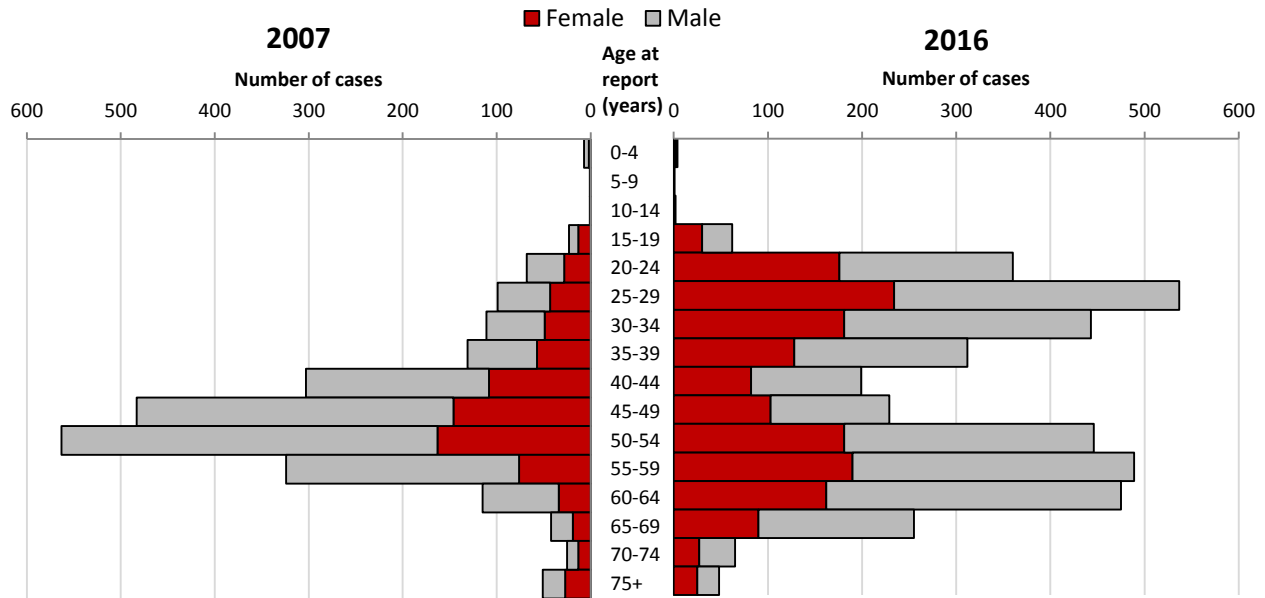


Table 7. Sex of reported hepatitis C virus cases in Wisconsin, 2012-2016

Sex†	2012		2013		2014		2015		2016	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Male	1583	55.8	1515	53.2	1953	68.4	2248	78.5	2314	80.8
Female	1032	35.9	1123	38.9	1263	43.7	1497	51.6	1612	55.6
Total	2615	45.8	2638	46.0	3217	56.0	3745	65.3	3927	68.1

†Sex of report was unknown for one in 2014 and one in 2016.

During 2016 there were 1,612 females and 2,314 males reported with HCV infection in Wisconsin. From 2012 to 2016, rates increased by 55% among females and 45% among males.

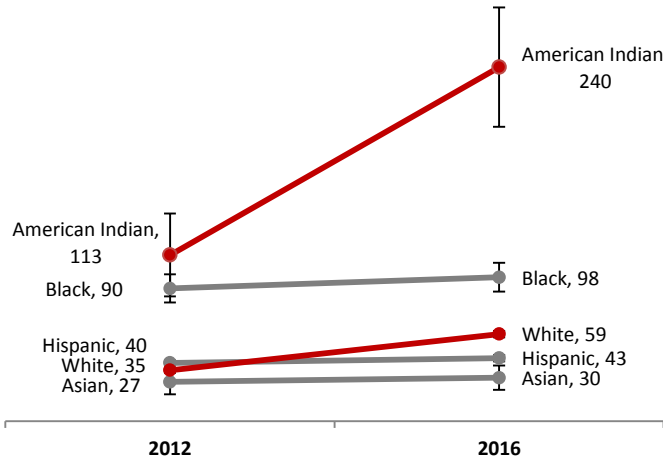
All Cases: Reports by Race and Ethnicity

In 2016, there was a significant increase in both the number and rate of new HCV reports from American Indians/Alaska Natives. In the previous four years, an average of 73 cases were reported with American Indians/Alaska Native race. In 2016, 135 cases were reported with American Indian/Alaska Native race.

The rates of HCV remained disproportionately high for American Indians and non-Hispanic Blacks relative to other racial and ethnic groups: in 2016, the rate among American Indians was 4 times higher than the rate among non-Hispanic Whites and the rate among non-Hispanic Blacks was 1.6 times higher than the rate among non-Hispanic Whites. The rate of HCV among American Indians and non-Hispanic Blacks has been substantially higher than the rate in non-Hispanic Whites for the past five years (Figure 6). The disparity of higher rates of acute HCV among American Indians/Alaska Native race is reported at the national level.⁴

Non-Hispanic Whites comprise the largest number of new HCV reports in Wisconsin and accounted for 2,817 or 72% of all reports in 2016. From 2012 to 2016, the rate of reported cases increased by 69% among non-Hispanic Whites.

Figure 6. Increasing rate of hepatitis C virus reported among American Indians and non-Hispanic Whites in Wisconsin†



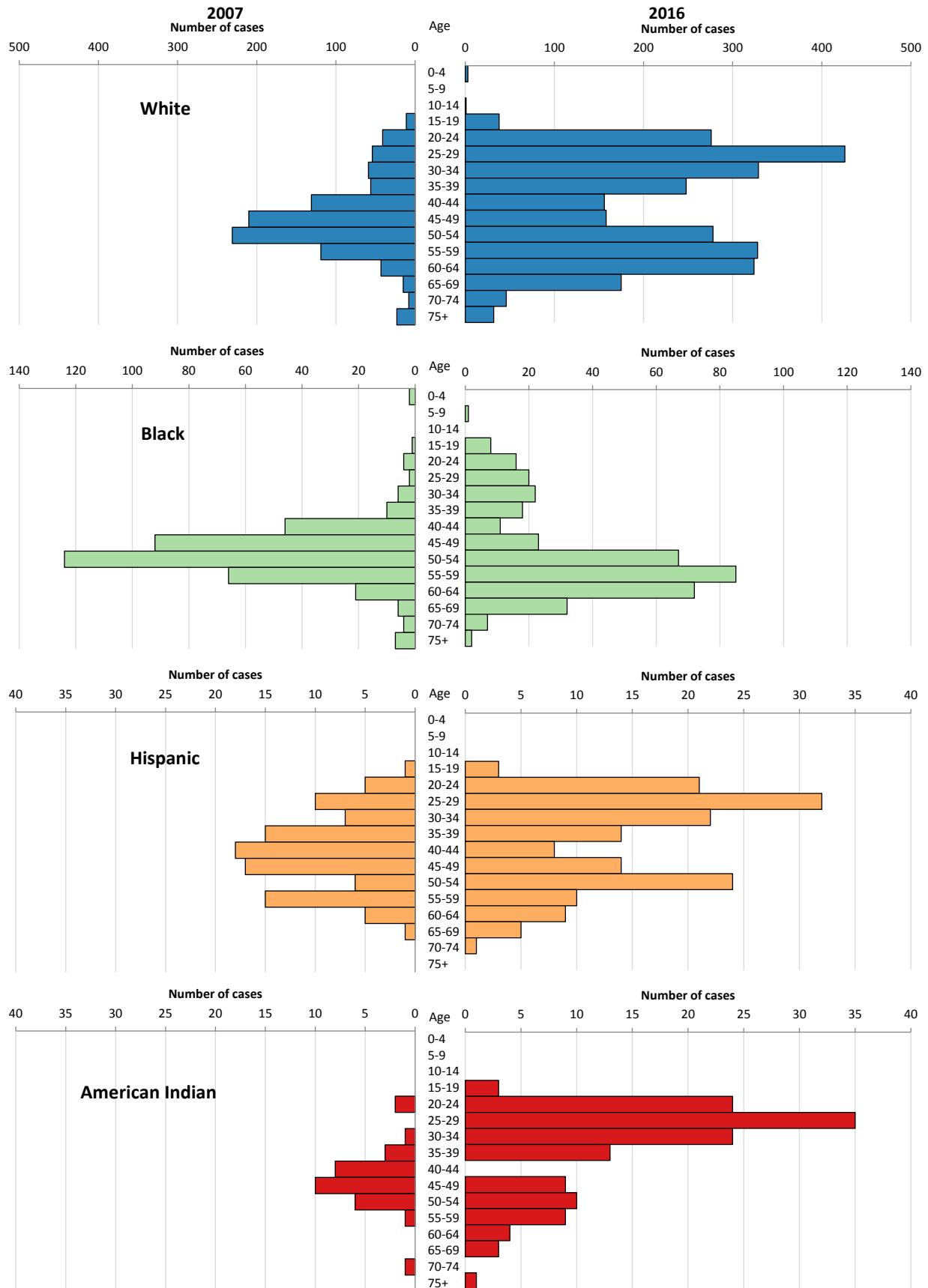
†Numbers shown are the rate per 100,000 population. The error bars show 95% confidence intervals for the rate. Race was unknown in 349 reports (13%) in 2012 and 353 (9%) reports in 2016.

Table 8. Race and ethnicity of reported hepatitis C virus in Wisconsin, 2012-2016

Race/Ethnicity	2012		2013		2014		2015		2016	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
Hispanic	140	39.5	140	38.6	158	42.5	190	51.2	163	42.8
American Indian	62	112.7	77	138.8	75	134.2	77	137.7	135	240.0
Asian	39	26.6	28	18.5	21	13.2	45	28.4	49	29.5
Non-Hispanic Black	345	90.0	321	83.0	385	98.7	460	117.9	384	97.6
Non-Hispanic White	1646	34.5	1787	37.4	2213	46.4	2628	55.1	2817	59.1
Other†	31	--	20	--	36	--	45	--	26	--
Unknown	352	--	265	--	329	--	300	--	353	--
Total	2615	45.8	2638	46.0	3217	56.0	3745	65.3	3927	68.1

†Rates were not calculated for the category Other Race due to unknown population denominator.

Figure 7. Shift in the age distribution of new reports of hepatitis C virus from 2007 to 2016, by race

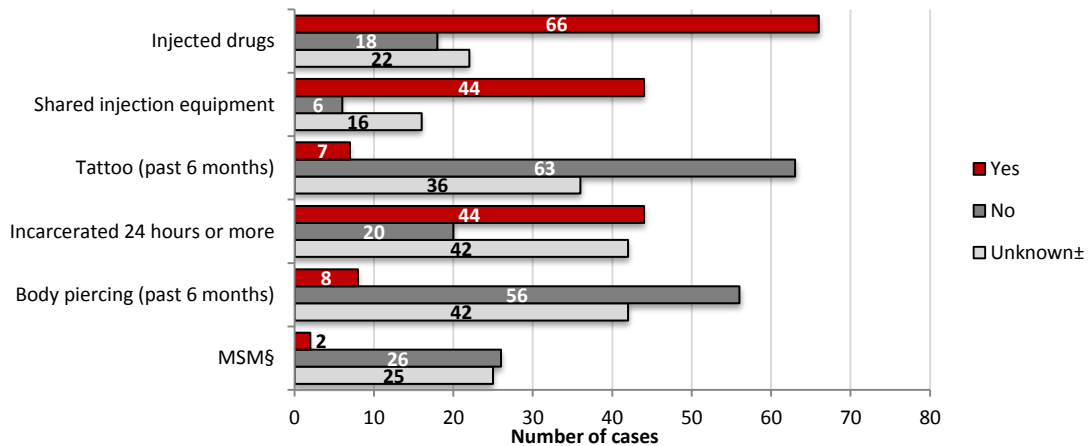


Acute Cases: Risk

Case follow-up and investigation for HCV was completed for over 90% of acute HCV infections in 2016. The primary risk factor for acute HCV infection was injection drug use, reported by 66 (62%) of 106 persons with acute HCV. Among those who reported injection drug use, 67% reported sharing “works” or injection equipment. Syringes, needles, cookers, cottons, water, and spoons were common items shared, with each reported by more than one third of people who shared equipment. Of 53 men with acute HCV infection, two reported sexual activity with a male, **Figure 8**.

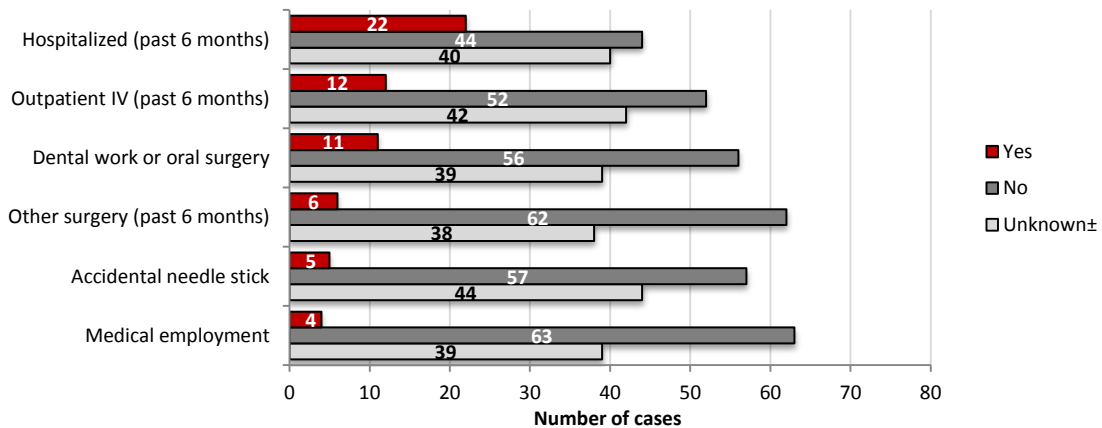
The spread of HCV in health care settings in Wisconsin is rare, but can occur through contaminated needles, syringes or other sharp instruments. Of 106 persons with acute HCV, 22 (21%) reported recent hospitalization and 12 (11%) reported recent outpatient intravenous procedure, **Figure 9**. Since more than one risk or exposure may be indicated, this may represent overlapping risk and not necessarily the source of exposure.

Figure 8. Reported acute hepatitis C virus, by risk behavior, 2016†



†A total of 106 case reports of acute hepatitis C were received in 2016. More than one risk behavior may be indicated on each case report. ‡Shared injection equipment was evaluated as a risk factor among 66 case reports with injection drug use indicated. ±No risk data reported. §MSM: Men who have sex with men. MSM was evaluated as a risk factor among 53 men reported with acute HCV.

Figure 9. Reported acute hepatitis C virus, by risk exposure, 2016†



†A total of 106 case reports of acute hepatitis C were received in 2016. More than one risk exposure may be indicated on each case report. ±No risk data reported.

Acute Cases: Demographics

During 2016, 106 reports of acute HCV were reported at a rate of 1.8 cases per 100,000. Reports of acute HCV infection increased more than 300% from 2012 to 2016 in Wisconsin. In 2016, the median age of acute HCV cases was 30 years; 49% were aged 15-29, 50% were female and 93% were non-Hispanic White.

In 2016, the National Notifiable Disease Surveillance System changed how acute HCV cases are classified. Clinical criteria were changed to include a case with discrete onset of illness and jaundice or alanine aminotransferase (ALT) level above 200 IU/L during illness. In 2015, this criteria was ALT above 400 IU/L. The change in definition accounts for 20 of the Hepatitis C, Acute cases reported in 2016.

Table 9. History of acute hepatitis C virus reports, Wisconsin, 2007-2016

Year	Number	Rate per 100,000‡
2007	0	--
2008	2	--
2009	3	--
2010	10	0.2
2011	14	0.2
2012	26	0.5
2013	42	0.7
2014	49	0.9
2015	61	1.1
2016	106	1.8

‡Rates based on counts less than five have been suppressed. Rates based on counts <12 are statistically unreliable.

Figure 10. Percent of acute hepatitis C virus reports by sex, 2007-2016

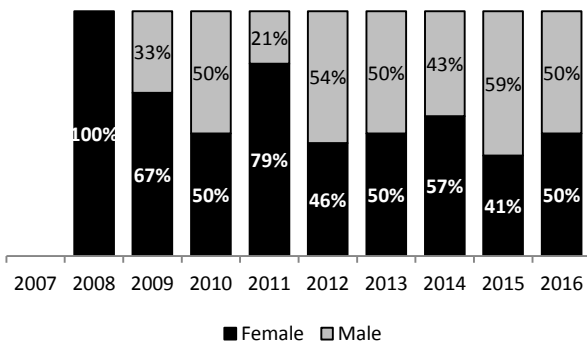
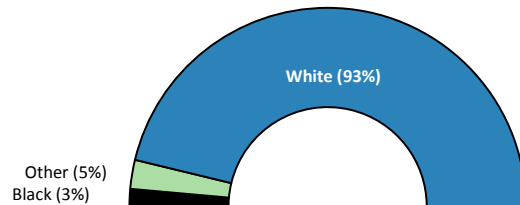


Figure 11. Percent of acute hepatitis C virus reports, by race/ethnicity, 2016



Hepatitis C Virus Reports among Persons Aged 15-29

Both local public health investigations and national surveillance data suggest that the majority of infections in young people during 2006-2012 were associated with injection drug use.^{5,6} Newly reported acute or chronic HCV infection in people aged 15-29 can be used as a surveillance indicator for recently acquired HCV infection. In 2016 alone, there were 960 new HCV infections reported among people aged 15-29 in Wisconsin. The rate of HCV in this age group increased 55% during 2012-2016, from 54.2 to 84.0 cases per 100,000 population. In 2016, 46% of HCV reports in this cohort were female, 77% were white, and 16% of all reports were residents of Milwaukee County.

HCV prevention among persons who inject drugs includes harm reduction programs (e.g., access to sterile syringes and drug preparation equipment), opportunities for drug treatment programs, and access to comprehensive health services that include HCV testing and linkage to care.

Table 10. History of hepatitis C virus reports among persons aged 15-29 in Wisconsin, 2007-2016

Year	Past or Present		Acute		Total	
	Number	Rate per 100,000	Number	Rate per 100,000†	Number	Total Rate per 100,000
2007	190	16.2	0	--	190	16.2
2008	227	19.2	1	--	228	19.3
2009	284	23.6	2	--	286	23.8
2010	355	30.7	9	0.8	364	31.4
2011	458	39.7	9	0.8	467	40.4
2012	599	52.3	22	1.9	621	54.2
2013	677	59.3	29	2.5	706	61.8
2014	860	75.2	35	3.1	895	78.3
2015	958	83.8	36	3.1	994	86.9
2016	904	79.1	56	4.9	960	84.0

†Rates based on counts less than five have been suppressed. Rates based on counts <12 are statistically unreliable.

2016 numbers reflect the Council of State and Territorial Epidemiologists 2016 change in Hepatitis C, Chronic and Hepatitis C, Acute case definitions.

Figure 12. Percent of hepatitis C virus reports among persons aged 15-29, by sex, 2007-2016

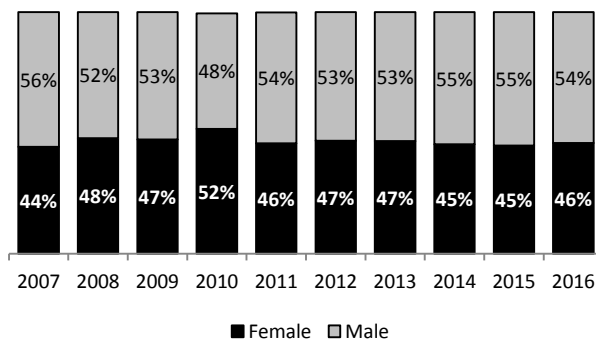
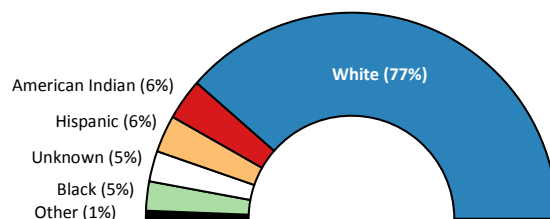


Figure 13. Percent of hepatitis C virus reports among persons aged 15-29, by race/ethnicity, 2016



Hepatitis C Virus Reports among Persons Aged 15-29: Reports by County

Table 11. Number, rate, and percent of newly reported HCV among persons aged 15-29, by county of residence, 2016

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016
Adams	2	1	0	7	7		--	1
Ashland	1	2	3	0	2		--	0
Barron	4	2	1	1	5		--	1
Bayfield	0	1	4	1	1		--	0
Brown	22	35	31	29	41		77.3	4
Buffalo	0	0	0	2	1		--	0
Burnett	1	1	0	3	7		--	1
Calumet	7	6	6	7	5		--	1
Chippewa	2	12	8	8	8		--	1
Clark	5	0	3	2	3		--	0
Columbia	8	6	6	6	11		--	1
Crawford	1	0	0	1	2		--	0
Dane	44	40	51	84	56		45.9	6
Dodge	7	8	5	17	23		▲ 149.7	2
Door	0	1	0	0	0		--	0
Douglas	6	10	16	15	8		--	1
Dunn	4	5	3	5	3		--	0
Eau Claire	6	25	30	22	19		68.6	2
Florence	2	5	0	1	0		--	0
Fond du Lac	7	15	17	22	26		▲ 135.9	3
Forest	4	2	1	3	6		--	1
Grant	0	1	2	3	2		--	0
Green	1	2	2	3	3		--	0
Green Lake	3	3	2	7	2		--	0
Iowa	1	0	3	4	1		--	0
Iron	0	1	1	3	0		--	0
Jackson	1	3	7	3	5		--	1
Jefferson	2	7	12	17	9		--	1
Juneau	9	4	6	3	5		--	1
Kenosha	14	14	32	18	16		44.7	2
Kewaunee	0	1	1	1	0		--	0
La Crosse	12	19	21	24	15		50.7	2
Lafayette	2	0	0	0	3		--	0
Langlade	2	5	9	5	9		--	1
Lincoln	3	5	4	3	5		--	1
Manitowoc	12	12	18	23	13		▲ 96.5	1
Marathon	21	24	19	13	27		▲ 111.3	3
Marinette	10	10	9	5	12		▲ 181.9	1
Marquette	3	1	1	5	3		--	0
Menominee	1	1	0	1	0		--	0
Milwaukee	128	111	161	181	153		69.6	16
Monroe	9	10	19	9	8		--	1

Persons Aged 15-29 Years

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016
Oconto	14	3	5	4	3		--	0
Oneida	6	3	6	9	1		--	0
Outagamie	13	22	22	28	40		▲ 113.9	4
Ozaukee	4	3	2	2	5		--	1
Pepin	0	1	0	2	1		--	0
Pierce	1	1	0	5	1		--	0
Polk	0	2	2	5	0		--	0
Portage	2	9	2	8	5		--	1
Price	0	3	5	12	4		--	0
Racine	16	12	27	10	19		52.5	2
Richland	1		4	6	0		--	0
Rock	9	9	22	21	11		--	1
Rusk	1	1	0	0	0		--	0
St. Croix	1	2	1	4	3		--	0
Sauk	8	6	9	7	24		▲ 219.3	3
Sawyer	0	1	3	1	2		--	0
Shawano	5	0	0	2	10		--	1
Sheboygan	14	15	15	14	15		73.4	2
Taylor	1	1	1	1	0		--	0
Trempealeau	1	0	6	7	2		--	0
Vernon	2	0	4	3	2		--	0
Vilas	2	3	3	6	13		▲ 499.6	1
Walworth	12	4	7	8	6		--	1
Washburn	1	1	1	1	0		--	0
Washington	8	9	13	17	13		59.0	1
Waukesha	26	29	37	47	35		51.6	4
Waupaca	2	4	16	21	19		▲ 235.9	2
Waushara	0	1	0	5	1		--	0
Winnebago	21	27	28	39	45		▲ 122.3	5
Wood	6	6	10	14	12		▲ 95.1	1
Federal Corrections	0	0	2	0	1		--	0
State Corrections	77	117	128	118	141		--	15
Unknown	0	0	0	0	1		--	0
Total	621	706	895	994	960		84.0	100

† Rates based on counts less than 12 have been suppressed because they are statistically unreliable. Rates are not available for Corrections populations. ▲ Indicates the rate in 2016 is higher than the statewide rate among people age 15-29.

Hepatitis C Virus Reports Among Adults Born During 1945-1965

National prevalence data show that people born during 1945–1965 are five times more likely than other adults to have hepatitis C.⁷ In addition to testing adults of all ages at risk for HCV infection, the CDC recommends all adults born during 1945–1965 receive one-time testing for HCV, regardless of history of risk. All persons identified with HCV infection should be referred to appropriate care and treatment services for HCV infection and related conditions. In 2016, there were 1,683 HCV infections newly reported in Wisconsin among adults born during 1945-1965. The rate of HCV in this age group increased 44% during 2012–2016, from 76.8 to 110.9 cases per 100,000 population. The increase likely reflects HCV screening among this cohort, consistent with recommendations issued by CDC in 2012 for identifying chronic HCV infection. In 2016, 38% of reports in this cohort were female, 67% were white, and 21% of all reports were residents of Milwaukee County.

Table 12. History of hepatitis C virus reports among persons born 1945-1965, 2007-2016

Year	Past or Present		Acute		Total	
	Number	Rate per 100,000	Number	Rate per 100,000†	Number	Total Rate per 100,000
2007	1665	133.1	0	--	1665	133.1
2008	1634	126.2	1	--	1635	126.3
2009	1552	117.3	0	--	1552	117.3
2010	1522	111.7	0	--	1522	111.7
2011	1377	97.8	1	--	1378	97.9
2012	1221	84.7	3	--	1224	84.9
2013	1120	76.2	1	--	1121	76.3
2014	1378	92.2	0	--	1378	92.2
2015	1622	107.0	2	--	1624	107.0
2016	1679	110.6	4	--	1683	110.6

†Rates based on counts less than 5 have been suppressed. Rates based on counts less than 12 are statistically unreliable. Rates are not available for Corrections populations.

Figure 14. Percent of hepatitis C virus reports among persons born 1945-1965, by sex, 2007-2016

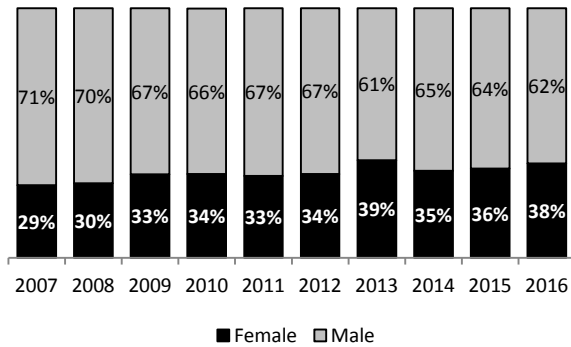


Figure 15. Percent of hepatitis C virus reports among persons born 1945-1965, by race/ethnicity, 2016

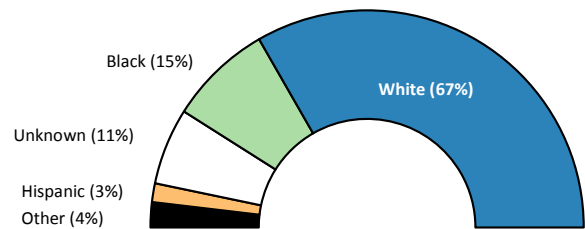


Table 13. Number, rate, and percent of newly reported hepatitis C virus among persons born 1945-1965, by county of residence

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016
Adams	11	3	7	9	10		--	1
Ashland	5	5	7	3	7		--	0
Barron	9	11	12	14	13		94.5	1
Bayfield	2	2	3	9	2		--	0
Brown	51	54	44	67	53		83.8	3
Buffalo	0	2	1	1	2		--	0
Burnett	6	4	9	17	7		--	0
Calumet	6	3	11	6	8		--	0
Chippewa	13	11	9	5	25		▲ 142.8	1
Clark	5	8	6	4	8		--	0
Columbia	10	7	13	20	23		▲ 142.1	1
Crawford	1	1	2	5	3		--	0
Dane	84	89	113	129	211		▲ 174.7	13
Dodge	8	8	6	15	11		--	1
Door	6	2	4	6	4		--	0
Douglas	8	11	18	14	4		--	0
Dunn	6	8	8	10	8		--	0
Eau Claire	11	13	12	23	38		▲ 159.3	2
Florence	2	1	1	1	5		--	0
Fond du Lac	12	18	17	25	17		60.4	1
Forest	8	2	2	1	3		--	0
Grant	6	5	7	5	11		--	1
Green	6	4	4	10	8		--	0
Green Lake	2	3	4	2	10		--	1
Iowa	2	2	3	3	9		--	1
Iron	0	1	0	1	2		--	0
Jackson	3	3	2	4	9		--	1
Jefferson	12	13	17	24	34		▲ 154.1	2
Juneau	4	6	6	5	12		▲ 143.7	1
Kenosha	52	45	51	58	43		104.8	3
Kewaunee	3	4	1	2	2		--	0
La Crosse	11	19	19	33	32		▲ 110.9	2
Lafayette	2	1	7	2	1		--	0
Langlade	6	3	3	5	5		--	0
Lincoln	1	6	6	7	6		--	0
Manitowoc	24	16	17	16	18		75.1	1
Marathon	19	16	13	14	18		50.3	1
Marinette	12	6	13	11	14		105.7	1
Marquette	4	0	6	1	8		--	0
Menominee	4	0	2	5	3		--	0
Milwaukee	338	290	402	464	348		▲ 164.2	21
Monroe	6	5	17	15	7		--	0

County of Residence	2012 Number	2013 Number	2014 Number	2015 Number	2016 Number	Trend	2016 Rate per 100,000	Percent of Reports in 2016	
Oconto	4	6	4	3	5		--	0	
Oneida	6	9	4	8	4		--	0	
Outagamie	23	19	24	52	58		▲	126.1	3
Ozaukee	9	11	7	11	9		--	--	1
Pepin	1	0	2	0	1		--	--	0
Pierce	5	6	5	17	12		▲	116.0	1
Polk	8	6	15	8	9		--	--	1
Portage	10	2	7	18	8		--	--	0
Price	2	1	3	1	6		--	--	0
Racine	71	65	59	81	73		▲	139.1	4
Richland	1	2	6	3	2		--	--	0
Rock	49	53	60	41	51		▲	126.4	3
Rusk	2	3	4	3	4		--	--	0
St. Croix	12	13	12	21	21		--	98.3	1
Sauk	7	14	8	12	34		▲	198.8	2
Sawyer	9	9	12	8	7		--	--	0
Shawano	8	5	4	17	21		▲	172.7	1
Sheboygan	13	12	12	20	17		--	53.5	1
Taylor	1	2	1	0	2		--	--	0
Trempealeau	5	3	6	4	7		--	--	0
Vernon	2	3	2	9	5		--	--	0
Vilas	8	5	3	3	8		--	--	0
Walworth	21	16	18	27	27		--	97.6	2
Washburn	7	5	8	5	3		--	--	0
Washington	15	12	12	13	7		--	--	0
Waukesha	27	35	38	45	46		--	40.0	3
Waupaca	8	7	22	26	23		▲	149.2	1
Waushara	3	2	3	4	12		▲	146.9	1
Winnebago	39	25	33	49	49		▲	113.9	3
Wood	16	8	14	12	6		--	--	0
Unknown	1	0	2	0	2		--	--	0
Federal Corrections	0	0	2	0	0		--	--	0
State Corrections	50	51	61	32	82		--	--	5
Total	1224	1121	1378	1624	1683		110.9	100	

†Rates based on counts less than 12 have been suppressed because they are statistically unreliable. Rates are not available for Corrections populations. ▲ Indicates the rate in 2016 is higher than the statewide rate among people born during 1945-1965.

Hepatitis C Virus Reports from Wisconsin Department of Corrections

Rates of HCV in correctional institutions are much higher than the general U.S. population. One reason for this is that populations who are affected by incarceration, such as people who inject drugs, are also more likely to have HCV infection. The Wisconsin Department of Corrections (DOC) offers HCV testing to people who enter prison with a risk factor for HCV and, beginning in 2015, those who were born during 1945-1965. Typically, reports from DOC account for 7%-10% of all HCV reports in Wisconsin annually. In 2016 alone, DOC reported 372 HCV cases. The median age of HCV cases was 33 years; 14% were female and 68% were non-Hispanic White.

Table 14. History of hepatitis C virus reports from the Wisconsin Department of Corrections, 2007-2016

Year	Number Past, Present or Acute†	Percent of Statewide Reports
2007	195	8
2008	178	8
2009	171	7
2010	173	7
2011	222	9
2012	232	9
2013	257	10
2014	314	10
2015	253	7
2016	372	9

†Acute cases were reported in 2010 (1 case), 2014 (1 case) and 2016 (2 cases).

Figure 16. In 2016, the number of HCV reports from DOC increased in three birth cohorts

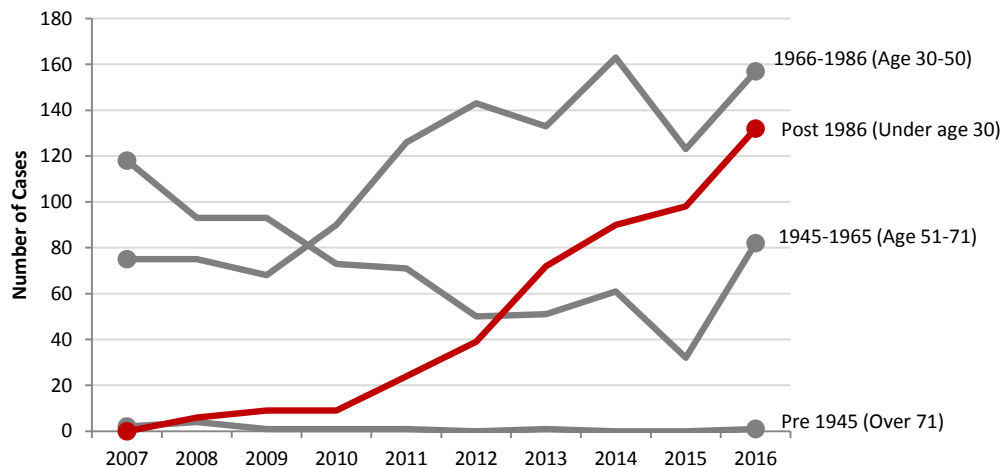


Figure 17. In the 1945-1965 birth cohort, a larger percentage of HCV reports indicated black and unknown race/ethnicity compared to other birth cohorts.

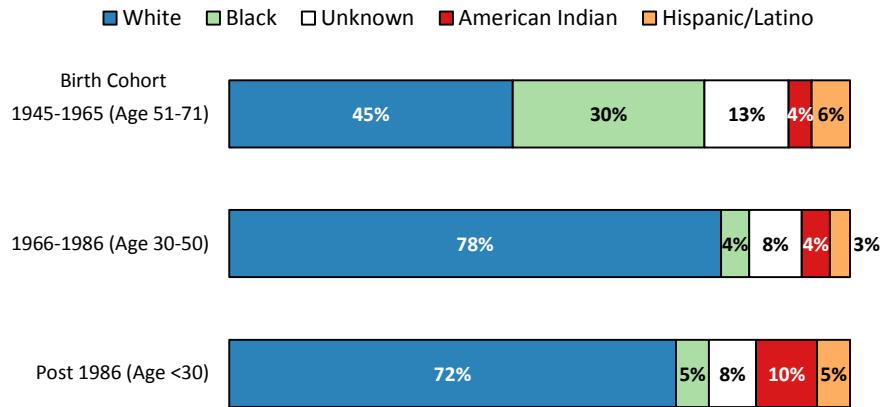


Figure 18. Percent of hepatitis C virus reports from DOC, by sex, 2007-2016

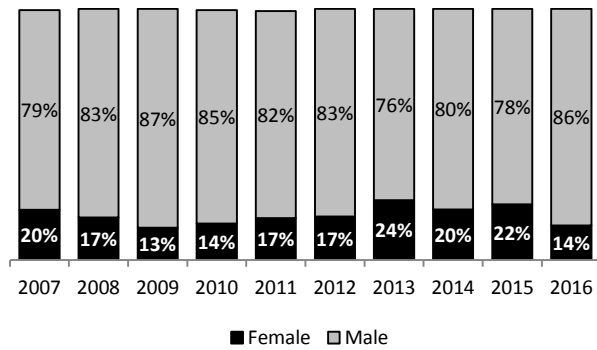
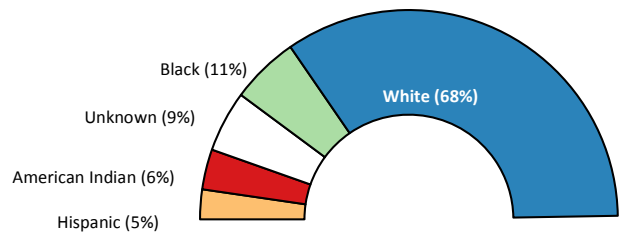


Figure 19. Percent of hepatitis C virus reports from DOC, by race/ethnicity, 2016



References:

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2. Meiman J, Tomasallo C, and Paulozzi L. Trends and characteristics of heroin overdoses in Wisconsin, 2003-2012. *Drug and Alcohol Dependence* 2015; 152:177-184.
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6. Stanley MM, Guilfoyle S, et al. Notes from the field: hepatitis C virus infections among young adults—rural Wisconsin, 2010. *MMWR* 2012;61(19):358.
7. Armstrong G, Wasley W, et al. The prevalence of hepatitis C virus infection in the United States, 1999 through 2002. *Annals of Internal Medicine* 2006; 144:10:705-714.

Technical notes:

1. This report was compiled by the Wisconsin Viral Hepatitis Program and is based on reports of hepatitis C virus (HCV) infection submitted by laboratories and local health departments (LHDs). Per Wis. Admin. Code ch. DHS 145, HCV is a reportable communicable disease. When cases are reported, LHDs contact persons with HCV infection to provide health education, risk reduction counseling, hepatitis A and B vaccine, and medical referral as needed.
2. Many cases of HCV infection are reported by laboratories. Since laboratories do not generally report demographic data such as region, race, or age, surveillance summary data by demographic characteristics are often incomplete.
3. Most reported cases of HCV infection represent chronic disease in persons who were infected years ago. Persons with acute infection are

often unaware of their infection because it presents with few if any symptoms.

4. This report is based on HCV surveillance data from the Wisconsin Electronic Disease Surveillance System (WEDSS) as of April 10, 2017. HCV case numbers used in other reports or individual county reports may vary depending on the date data is accessed, as WEDSS is not a static database and cases can be updated daily.
5. Rates are expressed as the number per 100,000 population in Wisconsin in 2015. Rates are described as significantly different if calculated 95% confidence intervals around the rates do not overlap.
6. Reports of HCV in persons deceased as of 2015 were identified by a match of WEDSS to the Wisconsin Vital Records registry of deaths of Wisconsin residents through 2015. The number of people with HCV who have moved out of Wisconsin or have a resolved or cured infection is unknown and has not been subtracted from all reported cases.

For more information:

Questions regarding Wisconsin hepatitis C virus data may be directed to: Lauren Stockman, hepatitis C epidemiologist, lauren.stockman@wi.gov, 608-267-0359.

Questions regarding the Wisconsin Viral Hepatitis Prevention Program may be directed to: Sheila Guilfoyle, Viral Hepatitis Program Coordinator, sheila.guilfoyle@wi.gov, 608-266-5819.

Additional resources:

Wisconsin Department of Health Services:
www.dhs.wisconsin.gov/communicable/ViralHepatitis/HepCInfection.htm
 Centers for Disease Control and Prevention:
www.cdc.gov/hepatitis/HCV/index.htm
 National Notifiable Diseases Surveillance System:
www.cdc.gov/NNDSS/script/casedefDefault.aspx